

International Conference
CHALLENGES OF EUROPE:
GROWTH, COMPETITIVENESS AND INEQUALITY



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Challenges Of Europe**

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FOREWORD

Dear Colleagues,

The proceedings you are holding in your hands contain the papers presented at the 11th International conference "Challenges of Europe: Growth, Competitiveness and Inequality", held in May, 2015 on the island of Hvar, one of the most beautiful islands in the world. The proceedings actually contain only a selected subset of papers which, in this way, seek to be scientifically evaluated by scholars.

This is an occasion to recall that the first conference was held in 1995 under the name "Enterprise in Transition". It was launched with the aim to primarily help the economies of Central and Eastern Europe, former socialist countries, in their efforts to adapt to the requirements of business operations in a market economy. The topics of first several conferences attracted the interest of scientific and professional community. The continuously growing number of participants from the whole world confirms the actuality of topics covered at the conference, which is held every two years.

In terms of adjustment of the post-socialist countries' economies of Central and Eastern Europe transition topics have lost their meaning over time. In 2009 the conference name was changed from "Enterprise in Transition" to "Challenges of Europe" in order to emphasize the need to investigate various economic topics and issues that the European economy faces. In doing so, we had in mind the need and the possibility to link business entities in order to achieve synergy effects. Such an idea has in no way excluded the possibility of addressing observing the economic problems from the position of other economies or the need of expanding achieving universal economic knowledge.

This was thus the basis of our last conference which focused on growth, competitiveness and inequality. The 2015 conference was in no way limited to the European context which is confirmed by the fact it was attended by scientists from all over the world. As conference organizers, we are particularly proud of our distinguished guests who were key speakers. The most prominent conference participant was Mr. Stiglitz, Nobel Prize winner and world renowned scientist who has honored our previous conferences and helped raise the quality and visibility of the conference, as well as the papers and their authors who participated at the conference. It is also important to mention that the other key speakers were professor Svejnar and professor Nijkamp. We thank them for the honour that they have shown us and we are especially thankful for their excellent speeches. Their presentations were impressive for all participants, especially for younger scientists and a group of PhD students who during the conference held their presentations as a part of their doctoral workshops.

The "Challenges of Europe" conference, as well as the proceedings in your hands, would not be possible without the many volunteers who gave their time and energy into organizing the conference. In this sense, we are especially thankful to the members of the international programme committee and the organizing committee who took large burden. We would like to extend our sincere gratitude to all the reviewers who participated in a double-blind procedure process that has enabled us to present here the selected papers for this conference. We would like to thank all others who have contributed in any way to the conference and the

publication of the proceedings without which scientific and professional public would be deprived of new cognitions presented in these papers.

Split, March 2016

Programme Committee Chairperson
Professor Ivan Pavić

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XI

CONFERENCE PROCEEDINGS



TRANSPARENCY OF AUDIT FIRMS, AUDIT COMMITTEE EFFECTIVENESS AND INTERNAL AUDIT EXISTENCE, AS MECHANISMS OF CORPORATE GOVERNANCE: THE CASE STUDY OF CROATIAN LISTED COMPANIES

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Key words: *Corporate Governance, Audit Firm Transparency, Audit Committee Effectiveness, Internal Audit Existence, Listed Companies*

ABSTRACT

Effective corporate governance and mechanisms of corporate governance provide an incentive for company's management in achieving their goals which are important for company, but also for all interested users, for shareholders. The aim of this study is to analyze internal and external mechanisms of corporate governance, for Croatian listed companies, in 2013. Based on research objectives, sample of 147 listed companies and 53 audit firms were collected from: Amadeus database; Zagreb stock exchange website; Register of annual financial statements and official Croatian Audit Chamber website.

Conclusions about mechanisms of corporate governance, based on the sample and created indexes, are as follows: 18% external auditors provide other services to companies; 60% companies does not published the amount of charges paid to audit firms; 26% listed companies are audited by Big Four; 68% transparency reports of audit firms are available; 8% audit firms have all important transparency report elements; 38% companies does not establish audit committee; most of audit committees have medium efficiency; companies with more effective audit committee choose Big Four; there is significant relationship between financial indicators (total assets, total equity, number of employees and number of managers) and audit committee effectiveness and 40% companies does not have internal auditor.

1. THE ROLE OF EXTERNAL AUDITING, AS EXTERNAL MECHANISM OF CORPORATE GOVERNANCE

Due to frequent fraudulent financial reporting, external auditing has an important role in corporate governance. The reason for global corporations collapse (Enron, WorldCom, etc.) is reflected as the lack of manager's integrity on inaccurate financial reporting (stock price manipulation). Thanks to deficiencies that can be seen in collapse of large corporations (Enron) and audit firms (Arthur Andersen), external auditing has developed as regulatory profession. It is impossible to consider external auditing importance in corporate governance if we do not know environment in which auditor operate and if we do not have quality and reliable information about capital market functioning. The role of external auditor in corporate governance is to reduce information asymmetry between principal and agent, because principal cannot monitor agent significant, which will result to company losses. In situation when external users cannot rely on reporting information, auditor has major role to confirm or reject the value of information provided to external users, which affects to credibility on provided information.

The importance of external auditing is in solving the agency problem. External auditing effectiveness in the agency problem is feasible in combine with other elements of good corporate governance, in effective system of internal controls, in internal auditing efficiency and audit committee efficiency and existence. However, auditor's role in corporate governance will depend on audit quality level, which in terms of the agency problem is based on compliance principals and agents motives. Audit quality will certainly mitigate conflict between managers and shareholders (for errors detection in financial reporting and reporting thereof by auditors). The larger scope of agency conflicts should be activated auditors with higher quality, which would have effect to lower agency costs for company. External auditor is important for corporate governance through the audit report, to confirm all stakeholders that financial statements are presented fairly. It should be noted that corporate governance efficiency system depends on auditor significant role. An effective system of reporting and controls that are associated with external auditor affect corporate governance with better functionality of company, as well as protecting shareholders interests.

2. THE ROLE OF INTERNAL AUDITING AND AUDIT COMMITTEE, AS INTERNAL MECHANISMS OF CORPORATE GOVERNANCE

The main role of internal auditing in good corporate governance is in effective implementation of internal controls, anticipation company's risk and to help management in achieving company's business aims. Company efficiency is based on company behaviour in business environment and competitive company's advantages. Manager role in business processes is in efficient use of resources, in realization of company's objectives, in social responsibility and in successful company positioning on the market. The role of internal auditor is not more in passive approach in auditing financial information but is in proactive approach, which is oriented to all users (especially for management), as consultant on internal control design and risk management compliance. Today, internal auditing importance in terms of rapid technology development, high competition, globalization and the shortest product life cycle in a complex business environment is exceptional. In that environment, importance of internal auditing is not only to identify problem, but to develop new approaches in corporate decision-making of modern business conditions. The expectations of internal auditing in modern business conditions are in creation added value for company. Added value will be achieved through preventive measures and activities and the object of research is focused on

entire business future. The internal audit's role is in assessing system of internal control and in auditing company's business to propose potential solutions for management, in order to achieve individual or strategic objectives. Internal auditing is conducted by independent company's employees, who audited all business activities, as well as consultative management's functions. The difference between external and internal auditors we can find in distinctive lead roles, where external auditor confirm reality and reliability of financial information at level of whole company, while internal auditor confirm reality and reliability of financial and operational information from different parts of organization, which is based on business processes.

Further, importance of audit committee in corporate governance increases because it has a major role in overseeing financial reporting process and internal control operations. The main tasks of audit committee are to monitoring process of creating financial statements, concerning about effectiveness of internal control and risk management and to monitor external auditing process. Better quality of relationship between audit committee and external auditor, as well as their mutual efficiency, will affect to financial reporting's quality and information's provision in making decision, what is important for corporate governance. In corporate governance is also important relationship between internal auditor and audit committee. The main task of audit committee in corporate governance is to monitor efficiency and effectiveness of internal auditor.

3. LITERATURE REVIEW

Using the importance of corporate governance mechanisms for listed companies, following studies are listed below (transparency of audit firms, audit committee effectiveness and internal audit existence).

Reviewing the available literature, similar themes regarding audit firm transparency are rarely investigated, because legal obligation to create and publish transparency report was only recently (in EU from 2006 and in Croatia from 2008). Pott, Mock and Watrin (2008) investigated effect of transparency report on auditor independence. Results indicate that there is no significant perceived difference as to whether the transparency report is mandatory or voluntary or whether the report is audited or not. Ehlinger (2010) researched determinants of transparency report for Austria, Germany and Netherland audit firms (125 transparency reports based on a self-developed disclosure index, using OLS regressions). Author concluded following: difference between observed countries in terms of given information quantity; difference between annual periods in quality of provided information; positive correlation between company size and extent of information; difference between Big Four and other audit firms on releasing information; difference between audit firm size and auditor independence; difference between companies that are members of the network and those that are not members. Previous researches analyze transparency of Croatian audit firms. Pivac and Čular (2012) analyze who audited Croatian listed companies to make quality index of transparency report and to define audit firms transparency. Conclusions are as follows: 1/3 companies are audited by Big Four; 5% of Croatian listed companies have no information about auditors; 57 audit firms audited Croatian listed companies (research sample); 2/5 transparency reports are not available; 1/5 of audit firms are transparent. Audit firms in terms of releasing the essential elements of transparency report are not in compliance with legal legislations. Čular (2014) analyze transparency of audit firms (for 2011 and 2012). General conclusion is that in both years we have audit firms that are not in accordance with Croatian Audit Act (better situation is in 2012).

To analyze audit committee efficiency, following studies are important do define conclusion about effectiveness of Croatian audit committees. Ajanthan, Balaputhiran and Nimalathashan (2013) researched corporate mechanisms in banks and banks performance. Using multivariate analysis, conclusions are as follows: all variables of corporate governance that were included in study were positively associated with ROE; board diversity and board meeting frequency are positively associated with ROE, while board size and outside directors percentage have a negative relationship with ROE; board meeting frequency in public banks is positively associated with ROA, while board size, board diversity and outside director's percentage have a negative relationship with these indicators. Bahrain and Mat Zain (2013) analyze impact of corporate governance on bank performance in Malaysia. Using descriptive statistics and multivariate analysis, following conclusions has been adopted: board size, audit committee size and frequency of audit committee meetings have positive relationship with bank performance; percentage of independent non executive board of directors and percentage of independent non executive audit committee members have negative correlation with bank performance. Hoque, Islam, Ahmed (2013) conducted study for 25 listed banks in Bangladesh, from 2003 to 2011. Based on performed panel analysis, conclusions are as follows: general public ownership and frequencies of audit committee meetings are positively and significantly associated with return on assets (ROA), return on equity (ROE) and Tobin's Q. Independence of audit committee members have positive and significant effect on bank performance, measured by Tobin's Q. Fidanoski, Mateska and Simeonovski (2013) also performed study on the same topic for banks in Macedonia. Based on performed OLS regression, conclusions are as follows: size of supervisory and management board is positively related to bank's profitability measured by ROA; there is significant impact in negative direction of board's independence, measured by the proportion of non-executive members seated in supervisory board to bank's profitability, measured with ROA and ROE. In Croatia, the study related to mechanisms of corporate governance (the role of the audit committee in enhancing the efficiency of external and internal mechanisms of corporate governance) is performed by Tušek, Filipović and Pokrovac (2008). Empirical research over 50 listed companies and 50 audit firms was conducted, from May 2007 to January 2008. Using descriptive statistics and t-test for independent samples, following conclusion is made: audit committee, as a subcommittee of supervisory board, has influence on greater efficiency of external audit and supervisory board. Tušek, Filipović and Filipović (2009) performed research related to issues of relations between external and internal mechanisms of corporate governance, i.e. external auditing and supervisory board. Empirical research over 50 listed companies and 50 audit firms was conducted, from May 2007 to January 2008. Using descriptive statistics and t-test for independent samples, following conclusions are made: external audit contributes to efficiency of supervisory board and supervisory board contributes to effectiveness of external audit. Vuko, Čular and Maretić (2014) analyze the role and effectiveness of internal mechanism (audit committee) of corporate governance on credit institutions performance in Croatia. Based on research objective, sample of 78 credit institutions listed on Zagreb Stock Exchange, from 2007 to 2012, has been collected and efficiency index of audit committee (EIAC) has been created. Based on the sample and created EIAC, conclusions are as follows: audit committees of credit institutions have medium efficiency, based on EIAC measurement; there is a significant difference in audit committee effectiveness, in observed period; there is no positive relationship between audit committee effectiveness and credit institution performance; there is a significant difference between level of audit committee effectiveness and audit firm type.

Research about status and prospect of financial reporting and internal auditing was conducted in Croatia by Sever (2009) based on annual survey of the Code of Corporate Governance for

listed companies. Research shows that 62% of companies have internal auditors and developed internal control system. The role of internal auditing in enhancing corporate performance, on empirical level, in Croatia was researched by Tušek and Sever (2011) with follow conclusion: degree of internal auditing in Croatian companies does not correspond with current phase of professional development in countries with developed market economies and they need to continue education with in recent trends in development of internal auditing profession. Looking on situation of internal auditing existence for Croatian listed companies, Čular and Šušak (2013) concluded that 46% listed companies have internal auditor, while only 18% have organized internal auditing department.

4. THE TRANSPARENCY INDEX OF AUDIT FIRMS

Transparency report is an attempt to approach audit profession to public, especially for public interest companies. If transparency of audit firms is higher, confidence between auditors and users of audit services is higher.

The audit firms and independent auditors that carry out audits of public-interest entities (companies whose securities are quoted on the stock exchange in the first quotation or in the public companies quotation; banks and other financial institutions; companies of the special state interest, the registered capital of which exceeds 300.000.000 HRK, in accordance with the decision of the Government of the Republic of Croatia on the listing of companies of the special state interest) shall publish on their websites or websites of the Croatian Audit Chamber, within three months of the end of each business year, annual transparency reports that include the following (Croatian Audit Act, 2012): a description of the organizational structure; a description of the ownership structure; a description of the network and the legal and structural arrangements in the network; a description of the governance structure of the audit firm; a description of the internal quality control system of the audit firm; an indication of when the last quality assurance review is referred; a list of public-interest entities; statement relating to the independence of auditors; a statement on the policy followed by the audit firm and the independent auditor concerning the continuing education of certified auditors; overall financial information; information concerning the basis for remuneration of certified auditors who sign audit reports on audits of public-interest entities.

Transparency report is an attempt to approach audit profession to public, especially for public interest companies. According to the Croatian Audit Act, audit firms who audited listed companies shall publish transparency report, with all important transparency report elements (Croatian Audit Act, 2012). The transparency index of audit firms (TIAF) measured transparency report element existence. There are 11 elements, which mean that TIAF comprises a total of 11 elements. The transparency index of audit firms (TIAF) is calculated as ratio of the number of existence elements in transparency report (ΣTR) and the maximum number of transparency report elements (Max TR).

Ratio is presented by the following equation:

$$TIAF = (\Sigma TR) / (\text{Max TR}) \quad (1)$$

where are:

TIAF – the transparency index of audit firms,

ΣTR – the number of existence elements in transparency report,

Max TR – the maximum number of transparency report element.

If transparency report element existence, the value is 1 and if element is not include into transparency report, the value is 0. Each item has same weight.

5. THE EFFICINECY INDEX OF AUDIT COMMITTEE

According to the Croatian Audit Act, public interest companies shall establish audit committee (Croatian Audit Act, 2012). The efficiency index of audit committee (EIAC) is index which measures existence of positive responses from the annual corporate governance code questionnaire, related to audit committee. There are 10 questions related to audit committee in the code of corporate governance, which means that EIAC comprises a total of 10 elements (Vuko, Čular and Maretić, 2014).

Questions from the annual corporate governance code questionnaire, which are related to audit committee, are as follows (Code of Corporate Governance): Did supervisory or management board establish audit committee; Was the majority of audit committee members selected from the group of independent members of the supervisory board; Did audit committee monitor the integrity of the financial information of the company, especially the correctness and consistency of the accounting methods used by the company and the group it belongs to, including the criteria for the consolidation of financial reports of the companies belonging to the group; Did audit committee assess the quality of the internal control and risk management system, with the aim of adequately identifying and publishing the main risks the company is exposed to (including the risks related to the compliance with regulations), as well as managing those risks in an adequate manner; Has audit committee been working on ensuring the efficiency of the internal audit system, especially by preparing recommendations for the selection, appointment, reappointment and dismissal of the head of internal audit department, and with regard to funds at his/her disposal, and the evaluation of the actions taken by the management after findings and recommendations of the internal audit; Did audit committee monitor the independence and impartiality of the external auditor, especially with regard to the rotation of authorized auditors within the audit company and the fees the company is paying for services provided by external auditors; Did audit committee monitor nature and quantity of services other than audit, received by the company from the audit company or from persons related to it; Did audit committee prepare rules defining which services may not be provided to the company by the external audit company and persons related to it, which services may be provided only with, and which without prior consent of the committee; Did audit committee analyze the efficiency of the external audit and actions taken by the senior management with regard to recommendations made by the external auditor; Did audit committee ensure the submission of high quality information by dependent and associated companies, as well as by third parties (such as expert advisors).

The efficiency index of audit committee (EIAC) is calculated as ratio of the positive answer number in the annual corporate governance code questionnaire (ΣAC) and the maximum number of questions (Max AC). Ratio is presented by the following equation (Vuko, Čular and Maretić, 2014):

$$EIAC = (\Sigma AC) / (\text{Max AC}) \quad (2)$$

where are:

EI AC – the efficiency index of audit committee,

ΣAC – the number of positive answers,

Max AC – the maximum number of questions.

For every positive answer, the value is 1, while for negative answer, the value is 0. Each item has same weight. To get a level of efficiency, the measurement scale is made (table 10).

6. EMPIRICAL RESULTS

Empirical research was conducted for Croatian listed companies. In 2013, we used 147 listed companies. The data about performance indicators of Croatian listed companies (total assets, total equity, number of employees, return on assets, return on equity, liquidity ratio and number of managers) were collected by Amadeus database.

Information about audit committee effectiveness (to make the efficiency index of audit committee), internal audit existence and information about audit firms, who audited Croatian listed companies, were conducted from the annual corporate governance code questionnaire. In 2013, 75% of Croatian listed companies have available the annual corporate governance code questionnaire, on Zagreb stock exchange website (total of 111 Croatian listed companies). Register of annual financial statements are used to find information who audited Croatian listed companies in 2013 (the name of audit firm).

To reach the required results about transparency of audit firms, we used 53 audit firms, who audited 147 Croatian listed companies. After that, we used transparency reports (from own websites of audit firms or from official Croatian Audit Chamber website) of observed audit firms to make the transparency index of audit firms (i.e. to find transparency report elements) and to find information about audit firm performances (total income of audit firms and income from audit services).

To confirm or reject hypothesis, we used descriptive statistics, the transparency index of audit firms, the efficiency index of audit committee, Mann-Whitney U-test and Pearson linear correlation coefficient. A computer program which was used is IBM SPSS 20.

H1a: All Croatian listed companies have an external auditor

In accordance with Croatian Audit Act, all Croatian listed companies have obligation to audit their financial statements. For observed companies (total of 111 listed companies), 1 company are not in accordance with Croatian Audit Act, which is shown in table 1.

Table 1. Does the company have an external auditor?

Does the company have an external auditor?	Frequency	Percentage
Company have an external auditor	110	99%
Company does not have an external auditor	1	1%
Total	111	100%

Source: Estimated according to the data from the author's data (2015)

H1b: External auditor of the Croatian listed company is not related with the company in terms of ownership or interests

In accordance with Croatian Audit Act and with the auditor independence principle, external auditor could not be in relation with the company in terms of ownership or interests. Table 2 shows that there is no external auditor who is related with Croatian listed company in terms of ownership or interests.

Table 2. Is the external auditor of the company related with the company in terms of ownership or interests?

Is the external auditor of the company related with the company in terms of ownership or interests?	Frequency	Percentage
External auditor of the company is related with the company in terms of ownership or interests	0	0%
External auditor of the company is not related with the company in terms of ownership or interests	111	100%
Total	111	100%

Source: Estimated according to the data from the author's data (2015)

H1c: External auditor of the company does not provide to the company, him/herself or through related persons, other services

In accordance with the auditor independence principle, external auditor could not provide to the company, him/herself or through related persons, other services. Table 3 shows that 18% external auditors provide to the company, him/herself or through related persons, other services.

Table 3. Is the external auditor of the company providing to the company, him/herself or through related persons, other services?

Is the external auditor of the company providing to the company, him/herself or through related persons, other services?	Frequency	Percentage
External auditor of the company provide to the company, him/herself or through related persons, other services?	20	18%
External auditor of the company does not provide to the company, him/herself or through related persons, other services?	91	82%
Total	111	100%

Source: Estimated according to the data from the author's data (2015)

H1d: Company published the amount of charges paid to the independent external auditors for the audit carried out and for other services provided

In accordance with full transparency for public interest companies, it is important that listed companies should publish the amount of charges paid to the independent external auditors for the audit carried out and for other services provide. Table 4 shows that only 40% companies published the amount of charges paid to the independent external auditors for the audit carried out and for other services provided. Other 67 public interest companies are not with accordance with full transparency (60%).

Table 4. Has the company published the amount of charges paid to the independent external auditors for the audit carried out and for other services provided?

Has the company published the amount of charges paid to the independent external auditors for the audit carried out and for other services provided?	Frequency	Percentage
Company published the amount of charges paid to the independent external auditors for the audit carried out and for other services provided	44	40%
Company does not published the amount of charges paid to the independent external auditors for the audit carried out and for other services provided	67	60%
Total	111	100%

Source: Estimated according to the data from the author's data (2015)

H1e: The most of Croatian listed companies are audited by Big Four audit firms

In accordance that Big Four audit firms are providing higher audit quality and that they are recognized as specialists in auditing for listed companies, it is important to know who audited Croatian listed companies. Table 5 shows that only 26% listed companies are audited by Big Four audit firms. Other 104 Croatian listed companies are audited by non Big Four audit firms (74%).

Table 5. Who audited Croatian listed companies (Big Four vs. Non Big Four)?

Who audited Croatian listed companies (Big Four vs. Other audit firm)?	Frequency	Percentage
Big Four	37	26%
Non Big Four	104	74%
Total	141	100%

Source: Estimated according to the data from the author's data (2015)

H2a: All observed audit firms publish their transparency reports

In accordance with Croatian Audit Act, audit firms who audited companies of public interest should publish transparency report on their own websites or on the Croatian Audit Chamber website. As we can see in table 6, 68% transparency reports are available.

Table 6. Availability of transparency report

Availability of transparency report	Frequency	Percentage
Transparency report is available	36	68%
Transparency report is not available	17	32%
Total	53	100%

Source: Estimated according to the data from the author's data (2015)

Other 17 audit firms (32%) are not in accordance with Croatian Audit Act, because their transparency reports are not published on their own websites or on the Croatian Audit Chamber website.

H2b: The most of audit firms, who audited Croatian listed companies, are not transparent (they do not have all transparency report elements)

Looking for transparency of audit firms, who audited Croatian listed companies, we conclude as follows: only 8% of audit firms have all important transparency report elements in 2013, i.e. we have only 3 audit firms with full transparency; 92% of audit firms do not have all important transparency report elements in 2013, i.e. we have 33 non transparent audit firms.

Table 7. Transparent and non transparent audit firms

Transparent and non transparent audit firms	Frequency	Percentage
Transparent	3	8%
Non transparent	33	92%
Total	36	100%

Source: Estimated according to the data from the author's data (2015)

It is very important that all of this non transparent audit firms, without all important transparency report elements, are not in accordance with Croatian Audit Act.

H2c: There is a significant difference in audit firm transparency, measured by the transparency index of audit firms and audit firm type

It can be assumed that Big Four audit firms have a higher level of transparency, measured by the transparency index of audit firms than non Big Four audit firms, because those are firms who provide higher audit quality and they are recognized as specialists in auditing companies from public interest.

Using Mann-Whitney U test, we can conclude that there is no a significant difference in transparency, measured by the transparency index of audit firms and audit firm type. The higher rank of the transparency index of audit firms has Big Four audit firms. Table 8 shows mean ranks of the transparency index of audit firms and significance value of Mann-Whitney U test.

Table 8. Audit firm transparency vs. audit firm type

Audit firm	Mean rank	Mann-Whitney U test (significance)
Big Four	19	21%
Non Big Four	12	

Source: Estimated according to the data from the author’s data (2015)

H2d: There is a significant relationship between audit firm transparency, measured by the transparency index of audit firms and audit firm performances (total income of audit firm and income from audit services)

It can be assumed that audit firms with higher level of transparency, measured by the transparency index of audit firms, have more successful business, measured by total income of audit firm and income from audit services. In order to define connection between audit firm transparency and audit firm performances, the Pearson linear correlation coefficient was used.

Table 9 shows that there is no significant relationship between audit firm transparency and audit firm performances (total income of audit firm and income from audit services).

Table 9. Relationship between audit firm transparency and audit firm performances

Performance indicator	Pearson correlation (r)	Significance
Income from audit services	-	57%
Total income of audit firm	-	34%

Source: Estimated according to the data from the author’s data (2015)

H3a: Audit committees of Croatian listed companies have medium efficiency, on average, measured by the efficiency index of audit committee

Mean value of the efficiency index of audit committee is 45 and we can conclude that most of audit committees have medium efficiency, on average. Table 10 shows level of efficiency and audit committee ranks of Croatian listed companies. Also, only 29% audit committees are with full efficiency, measured by the efficiency index of audit committee. It is very important to show that 43% audit committees have large inefficiency. Finally, 38% Croatian listed companies does not establish audit committee.

Table 10. Level of efficiency and audit committee ranks of Croatian listed companies

Level of efficiency	Audit committee ranks	Frequency	Percentage
Full efficiency	81-100	32	29%
High efficiency	61-80	26	23%
Medium efficiency	41-60	3	3%
Low efficiency	21-40	2	2%
Large inefficiency	0-20	48	43%
Total	-	111	100%
Mean		45	

Source: Estimated according to the data from the author's data (2015)

H3b: There is a significant difference between audit committee effectiveness, measured by the efficiency index of audit committee and audit firm type

According to the Croatian Audit Act, audit committee monitor independence of audit firms, especially contracts about facility and make recommendations to shareholders on auditors selecting. It can be assumed that public interest companies with more effective audit committee will choose Big Four audit firms, because those are firms who provide higher audit quality and they are recognized as specialists in auditing of listed companies.

Table 11. Audit committee effectiveness vs. audit firm type

Audit firm	Mean rank	Mann-Whitney U test (significance)
Big Four	85	0.7%
Non Big Four	65	

Source: Estimated according to the data from the author's data (2015)

Using Mann-Whitney U test, difference between audit committee effectiveness and audit firm type has been defining (table 11). It can be seen that higher mean rank of the efficiency index of audit committee has Big Four audit firms (value of mean rank is 85). Also, based on significance of 0.7%, we conclude that there is a significant difference between level of audit committee effectiveness and audit firm type.

Croatian listed companies with more effective audit committee choose Big Four audit firms.

H3c: There is a significant relationship between audit committee effectiveness, measured by the efficiency index of audit committee and performance indicators of Croatian listed companies

Corporate mechanisms and effective corporate governance should provide proper incentives to company in order to achieve objectives that are important for company and shareholders. Since the main aim of any company is successful and profitable business, it is assumed that effectiveness of corporate governance mechanisms, in this case audit committee, should contribute to more successful business of Croatian listed companies. In order to define connection between audit committee efficiency and performance indicators of Croatian listed companies, the Pearson linear correlation coefficient was used (table 12).

It can be seen that significance of Pearson correlation coefficient(r) for follow performance indicators is higher than 5%: return on assets, return on equity and liquidity ratio. Based on that, we conclude that there is no significant relationship between this financial indicators (return on assets, return on equity and liquidity ratio) and audit committee effectiveness, measured by the efficiency index of audit committee.

Table 12. Relationship between audit committee effectiveness and performance indicators of Croatian listed companies

Performance indicator	Pearson correlation (r)	Significance
Total assets	0,207	1,4%
Total equity	0,178	3,5%
Number of employees	0,145	8,4%
Return on assets	-	11,6%
Return on equity	-	53%
Liquidity ratio	-	75%
Number of managers	0,314	0,0%

Source: Estimated according to the data from the author's data (2015)

Other financial indicators (total assets, total equity, number of employees and number of managers) are significant. Based on that, we conclude that there is significant relationship between financial indicators (total assets, total equity, number of employees and number of managers) and audit committee effectiveness, measured by the efficiency index of audit committee. But, all of these relations are with low power ($r < 0,5$).

H4a: The most of Croatian listed companies have internal auditor and an internal audit system established

Internal auditing is in position of contemporary global organization units. Internal auditing needs to explore examine and review system of internal controls and their effectiveness in operation of each business system that reports on internal auditing results and propose solutions to management. For this reasons, it is very important that company have internal auditor and an internal audit system established.

Analyzing data in terms of internal auditor's existence for Croatian listed companies (146 companies), we have information that 60% of Croatian listed companies have internal auditor and an internal audit system established. Specifically, 40% of Croatian listed companies does not have internal auditor and an internal audit system established (table 13).

Table 13. Does the company have internal auditors and an internal audit system established?

Does the company have internal auditors and an internal audit system established?	Frequency	Percentage
Company have internal auditors and an internal audit system established	67	60%
Company does not have internal auditors and an internal audit system established	44	40%
Total	111	100%

Source: Estimated according to the data from the author's data (2015)

H4b: There is a significant difference between audit committee effectiveness, measured by the efficiency index of audit committee and internal auditor existence

It can be assumed that cooperation between internal auditors and audit committees results with higher level of audit committee efficiency, measured by the efficiency index of audit committee.

Table 14. Audit committee effectiveness vs. Internal Audit existence

Audit firm	Mean rank	Mann-Whitney U test (significance)
Company have internal auditors and an internal audit system established	57	60.5%
Company does not have internal auditors and an internal audit system established	54	
Total	-	-

Source: Estimated according to the data from the author's data (2015)

Using Mann-Whitney U test, difference between audit committee effectiveness, measured by the efficiency index of audit committee and internal auditor existence has been defining (table 14). Based on significance of 60.5%, we conclude that there is no a significant difference between audit committee effectiveness, measured by the efficiency index of audit committee and internal audit existence.

7. CONCLUSION

Research about transparency of audit firms, audit committee effectiveness and internal audit existence, as mechanisms of corporate governance was conducted for Croatian listed companies (sample of 147 listed companies) and Croatian audit firms (sample of 53 audit firms). For this research, the transparency index of audit firms and the efficiency index of audit committee were conducted. First, this paper analyzes the role of external auditing, as external mechanism of corporate governance. Based on samples and created index, conclusions are as follows: 18% external auditors provide to the company, him/herself or through related persons, other services; only 40% Croatian listed companies published amount of charges paid to external auditors; 26% listed companies are audited by Big Four audit firms; 32% of audit firms are not in accordance with Croatian Audit Act, because their transparency reports are not published on their own websites or on the Croatian Audit Chamber website and 92% of audit firms do not have all important transparency report elements. Second, this research analyzes the role of audit committee, as internal mechanism of corporate governance. Based on sample and created index, conclusions are as follows: 38% of Croatian listed companies does not establish audit committee; Croatian listed companies with more effective audit committee choose Big Four audit firms; there is significant relationship between financial indicators (total assets, total equity, number of employees and number of managers) and audit committee effectiveness, measured by the efficiency index of audit committee. Also, the role and existence of internal auditing, as internal mechanism of corporate governance has been researched (40% of Croatian listed companies does not have internal auditor and an internal audit system established). As we can see, internal and external mechanisms of corporate governance are not yet with accordance with Croatian Audit Act. Also, ineffective mechanisms of corporate governance may result negatively on shareholder's decisions and business performances.

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IMPACT OF INTEREST RATE AND INFLATION ON GDP IN BULGARIA, ROMANIA AND FYROM

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ABSTRACT

The influence of interest rates and inflation on GDP growth has been the subject of long debates and many research studies: from purely theoretical analysis of the channels through which this is accomplished, to empirical studies on a broad panel of countries. Because of these shared arguments about the impact of interest rates and inflation on GDP growth, as an area of investigation in this paper we took FYROM, Bulgaria and Romania. The first country is not part of the EU but the last two are, but all of them non-Eurozone members. The analysis aims to investigate the influence of these variables on GDP, on one hand in the country which is still on its way to enter the EU and on the other hand for the two countries that are expected to enter the common monetary area. The paper examines existing theory to create an analytical framework for the impact of interest rate and inflation on GDP, then to quantitatively evaluate the importance of these variables for the economic growth in the three countries. A cointegration analysis with three variables (interest rate, inflation and GDP growth) and a Granger causality analysis are implemented to examine the relations between these variables. Unit root tests will be applied in so as to examine the relationships among the respective data series. Our target period is from 2000 until present time, offering both a relatively positive first period until the arrival of the debt crisis by the end of the 2000s, leading to strict austerity and deflationary gaps in most countries. Our basic aim is to investigate the links between monetary and fiscal measures, especially for developing countries that strive for economic growth without having a strong home currency.

JEL Classification: E31, E43, O40

1. INTRODUCTION

The paper is focusing and analyzing three countries: FYROM, Bulgaria and Romania. The first country is not part of the EU and the last two are, but all of them non-Eurozone members. The analysis aims to investigate the influence of interest rates and inflation on GDP, in the country which is still on its way to enter the EU (FYROM) and the other two countries that are expected to enter the common monetary area in the next period (Bulgaria and Romania).

Bulgaria has been experiencing a slow and painful transition to a market economy since the end of Communist rule. Bulgaria started accession talks with the EU in 2000, and signed an EU accession treaty in April 2005 and joined in January 2007. Today, it is an economy of 7.3 million people with a per capita income of \$6,870. In the decade following up to EU accession, Bulgaria involved in difficult reforms to form macroeconomic stability and encourage growth. It built fiscal barriers by accruing fiscal surpluses between 2004 and 2008, and reduced public debt from over 70 % of GDP in 2000 to 18.5 % in 2012, the second lowest debt levels in the EU. During the years while IMF currency board was setting the monetary policy, Bulgaria fixed the lev to the deutschmark (and now also to the euro), and reduced inflation to 1%.

In the last 15 years, Romania has made considerable progress as a country that implement market economy as the basic economic system. Joining the European Union (EU) in 2007 was a critical point for the implementation of transformation and renovation. During the years of the economic crisis, Romania made a quick retrieval thanks managing reforms with support from the international financial institutions. The reforms consist of changes in education, the financial sector, public financial management, and public administration. Some of these directly affected the recovery from the crisis, and the other part influence the long-term recovery and growth. Packages of macro-stabilization and fundamental actions, supported by a multilateral program with the World Bank, International Monetary Fund and European Commission, helped the country pass the effects of the crisis by reestablishing macroeconomic stabilities and sustain with the economic growth. Since the international financial program, the exchange rate of the domestic currency with the euro has remained generally stable, with moderate changes in periods.

The Former Yugoslav Republic (FYR) of Macedonia has made great steps in reforming its economy over the last 15 years. The country has made important progress realizations, but additional steps in many areas are still needed in order to have more significant and needed economic growth and bigger living standards. The country is not part of the EU, but economy is associated to European countries which are the biggest source of investment and trade partners. Although the economy was stroked from the economic crisis in the euro zone, it maintained macroeconomic stability through by steering strict monetary policy, which keeps the domestic currency fixed against the euro. The countries is walking towards sustainable growth path, creating more and better jobs, and promote prosperity with GDP growth and fixed exchange rate.

The paper examines existing theory to create an analytical framework for the impact of interest rate and inflation on GDP, and to quantitatively evaluate the importance of these variables for the economic growth in the three countries. A cointegration analysis with three variables (interest rate, inflation and GDP growth) and a Granger causality analysis are implemented to examine the relations between these variables. Unit root tests will be applied in so as to examine the relationships among the respective data series. Our target period is from 2000 until present time, offering both a relatively positive first period until the arrival of the debt crisis by the end of the 2000s, leading to strict austerity and deflationary gaps in most countries.

2. LITERATURE REVIEW

There are significant research papers concerning the influence of interest rates and inflation rates on GDP. They are analyzing countries with different economic development and taking data sets with different duration and frequency.

According to Di Giovanni, McCrary and Wachter (2009), a repeated question in economics is the extent to which monetary policy involvements affect the real economy. This is a central research theme of numerous studies – for example Christiano, Eichenbaum and Evans (1999), Romer and Romer (1989) and Sims (1972, 1980), including work done by the 2011 Economic Nobel Prize winners, Sargent and Sims, who investigated the impact and causal relationships of unexpected shocks in the economy. These include, for example, the impact of an interest rate on GDP or inflation (Sargent and Sims 2011)

An increase in interest rates makes the cost of money more expensive, particularly when investments show a significant sensitivity to variations in interest rates. This could cause a decrease in aggregate demand, on one hand directly through investments and on the other indirectly through a lower wealth effect in the private sector and lower consumption. Also, higher interest rates could also initiate an increase in savings and could entice foreign inflows that could lead to a currency appreciation. This is especially true in a fairly small open economy, with a flexible exchange rate regime and relatively mobile capital (Briotti 2005).

Di Giovanni et al. (2009) found that interest rates lower quarterly real growth only moderately. Their results, using an ordinary least squares (OLS) methodology, show that a 1 percentage point increase in the interest rate in the Netherlands resulted in a 0.094 percentage point decrease in the real growth rate. A similar increase in the interest rate in France gave only a 0.015 percentage point decrease in the real growth rate. Their research shows an average interest rate effect of -0.043 on real growth across 12 European countries.

Research by the Organisation for Economic Co-operation and Development (OECD) (2008) shows that the impact on the US GDP (four to six quarters later) as a result of a 100 basis point increase in the real short-term interest rate is -0.09% (using reduced form estimation) and -0.06% (using a vector autoregression model). This research was done using quarterly data that covers the period 1990 (Q4) to 2007 (Q3).

According to research done by the European Central Bank (ECB) analysts (2002), the impact on real GDP as a result of a 100 basis point increase in the ECB repo rate is -0.34% after the first year and -0.71% after the second year, while the impact on consumer prices is -0.15% after the first year and -0.30% after the second year (see Table 1). The impact shown by the NCB (the ECB's macroeconomic model) is slightly lower, with a real GDP impact of -0.38% after year two and a reduction of -0.21% in the consumer prices. The NiGEM model shows a decrease of 0.47% in real GDP during year two.

Saymeh and Abu Orabi (2013) used regression analysis to estimate the impact of interest rates (among other variables) on real GDP for Jordan from 2000 to 2010. They found that a one period lagged interest rate had a significant impact on GDP, with a coefficient of -0.152. With a generalized autoregressive conditional heteroskedasticity (GARCH) regression, they estimated a lagged interest rate impact of -0.34 on real GDP.

Barro (1995) examines the issue and finds a significant negative relationship between inflation and GDP. The study contains a large sample data of more than 100 economies for the period 1960 to 1990 and to assess the effects of inflation on growth, a system of regression equations is used, in which many other determinants of growth are held constant. This framework is based on an expanded view of the neoclassical growth model as stated by Barro and Sala-i-Martin (1995). The study indicates that there is a statistically significant negative relationship between inflation and gross domestic product. More specifically, an

increase in the average annual inflation by 10 percentage points per year lowers the real GDP growth by 0.2 to 0.3 percentage points per year.

Bruno and Easterly (1995) report the issue of inflation and growth and find no evidence of any consistent relationship between these variables up to a certain level of inflation. They evaluate that the growth falls during distinct high inflation crisis, above than 40 percent, and recovers after inflation falls. Their empirical analysis shows that there exists a sequential negative relationship between these two variables beyond 40 percent of inflation increase. They conclude that there is no significant influence to economic growth due to discrete high inflation crisis.

Using co-integration and error correction models, Malik and Chowdhury (2001) finds a long-run positive relationship between GDP growth rate and inflation for four South Asian countries. Concerning the results, they found that moderate inflation is helpful to faster economic growth and rise the GSP in a country. They recommend moderate inflation for growth of the economies of Bangladesh, India, Pakistan and Sri Lanka.

Munir et al. (2009) analyze the non linear relationship between inflation level and economic growth rate for the period 1970-2005 in the economy of Malaysia. Using annual data and applying new endogenous threshold autoregressive (TAR) models proposed by Hansen (2000), they find an inflation threshold value existing for Malaysia and verify the view that the relationship between inflation rate and economic growth is nonlinear. The estimated threshold regression model suggests 3.89 percent as the structural break point of inflation above which inflation significantly hurts growth rate of real GDP.

Khan and Senhadji (2001) examine effects of inflation on growth separately for industrial and developing countries. The data set covers 140 countries from both groups and non-linear least squares (NLLS) and conditional least squares methods are used. The empirical results show the presence of a threshold beyond which inflation exerts a negative effect on growth and GDP. The assessment of low inflation for sustainable growth is intensely supported by this study.

Another study done by Hobijn and Steindel (2009), shows that GDP can be seen as major dimension for economic activity because its movements on the short and long run are correlated with factors that influence the level of GDP, among which are inflation rate and income.

Ahmad and Mortaza (2005) assessed the idea that constant inflation rates encourage the development process of a country, and hence economic growth. Using annual data set on real GDP and CPI of Bangladesh for the period of 1980 to 2005, they demonstrate statistically significant long-run negative relationship between inflation and economic growth for the country as showed by a statistically significant long-run negative relationship between CPI and real GDP. Also as a threshold they suggested 6% of inflation above which inflation harmfully affects economic growth.

However, Johanson (1967) found no conclusive empirical evidence for either a positive or a negative association between the two variables. His view was that the effect of inflation on growth was not particularly important. Also Fischer and Modigliani (1978) suggest a negative and nonlinear relationship between the rate of inflation and economic growth through the new growth theory mechanisms (Malla, 1997). Fisher (1930) also found negative relation between inflation and growth for a large set of countries.

All of the above discussion shows different results. In some of them there is an existence of relationship between inflation, interest rates and GDP, and in others there is moderate influence of the first two variables to GDP in countries with different economic development and structure.

3. DATA COLLECTION

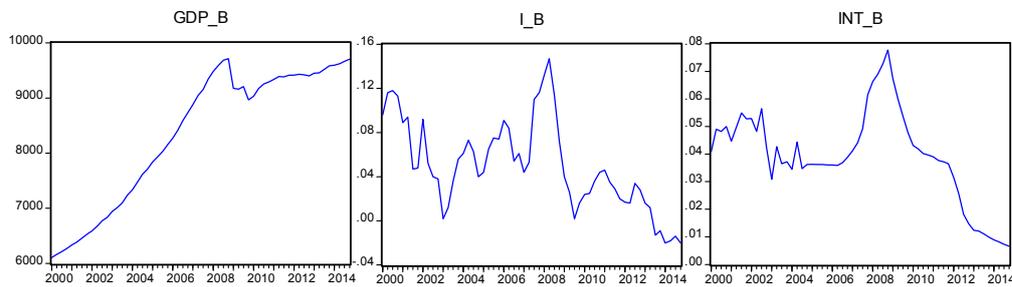
For the purpose of the study we take the data series from three countries, including gross domestic product (GDP), inflation rate and interest rates. In order to check impact of interest rates and inflation on GDP in Bulgaria, Romania and FYROM, comprehensive data has been gathered for the period 2000-2014 with quarterly frequency of data values within each year. The data series were taken from different sources. We have consulted the State Statistical Offices in Bulgaria, Romania and FYROM, and also the rest of the data series were collected from the Central Banks of the three countries that are observed and analyzed and also from Eurostat.

4. ANALYSIS AND DISCUSSIONS

This chapter covers the estimation and analysis of data for the period 2000 - 2014 to check out the impact of inflation rate and interest rate to GDP in Bulgaria, Romania and FYROM. First, we present the movements graphically for the three variables: gross domestic product (GDP), inflation rate (I) and interest rate (INT) for the three countries.

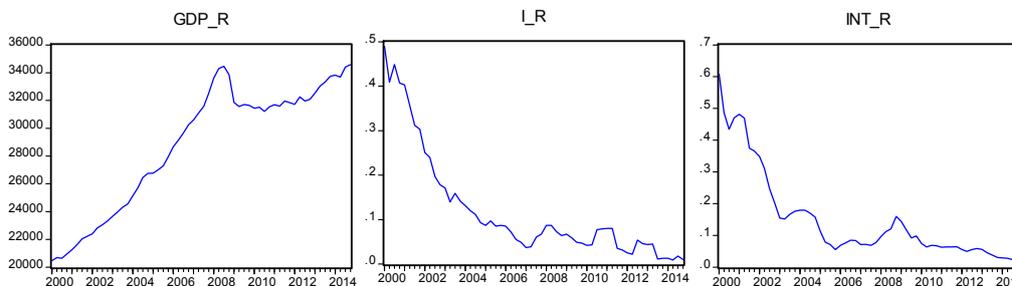
After that, in the subsequent parts we cover analysis based on correlation, presenting the correlation matrixes, and unit root tests, performing and analyzing Augmented Dickey-Fuller (ADF) test. After that we analyze the cointegration as an econometric technique for testing the correlation between non-stationary time series variables. Here we use Johansen model for analysis. And at the end we implement the Granger Causality tests, analyzing the causality between specific variables in three different countries.

Graph 1: GDP, inflation and interest rates of Bulgaria 2000-2014 (quarterly)



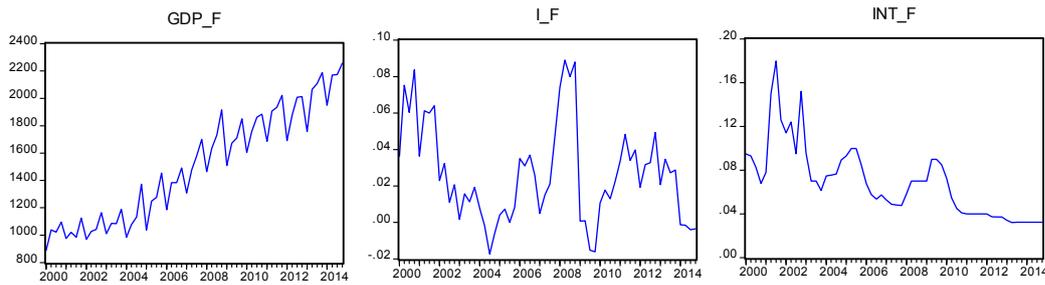
Source: State Statistical Office in Romania, Central Bank of Bulgaria

Graph 2: GDP, inflation and interest rates of Romania 2000-2014 (quarterly)



Source: State Statistical Office in Bulgaria, Central Bank of Romania

Graph 3: GDP, inflation and interest rates of FYROM 2000-2014 (quarterly)



Source: State Statistical Office in FYROM, Central Bank of FYROM

4.1. Correlations

Correlation is used as statistical technique to measure and describe the strength and direction of the relationship between two variables. In our analysis we use correlation matrixes for the three countries in order to measure the correlation (strength and direction) between the different variables for each country.

Table 1: Correlation matrix Bulgarian GDP, inflation and interest rates

	GDP_B	I_B	INT_B
GDP_B	1.000000		
I_B	-0.375706	1.000000	
INT_B	-0.255018	0.671215	1.000000

Concerning Bulgaria, both inflation and interest rates have a small negative correlation against the GDP of the country, showing a negative relationship among the variables. In addition, inflation and interest rates have a positive correlation of 0.67, as expected, revealing a relatively strong relationship between the two variables, in accordance with basic monetary policy.

Table 2: Correlation matrix Romanian GDP, inflation and interest rates

	GDP_R	I_R	INT_R
GDP_R	1.000000		
I_R	-0.874799	1.000000	
INT_R	-0.847793	0.977172	1.000000

Likewise, inflation and interest rates in Romania have a negative correlation against GDP but at significantly larger values than Bulgaria, i.e. -0.87 and -0.85, respectively. Equally strong is the correlation between interest rates and inflation, which reaches almost the perfect positive correlation level, i.e. 0.98. This could be a sign of a monetary policy that follows closely the changes of the price levels in the country during the period 2000-2014.

Table 3: Correlation matrix Macedonian GDP, inflation and interest rates

	GDP_F	I_F	INT_F
GDP_F	1.000000		
I_F	-0.074665	1.000000	
INT_F	-0.728305	0.106115	1.000000

In this case, inflation to GDP correlation in FYROM is relatively non-existent, having a marginally negative value of -0.075, revealing a very weak relationship between the two variables. On the contrary, interest rates to GDP have a negative correlation of -0.73 proving a strong negative relationship between these two variables. As a result of the above fact, the interest rates and inflation are weakly correlated, i.e. 0.11, showing that the monetary policy of the country does not closely monitor changes in the prices levels.

4.2 Unit Root Tests

We use unit root test to find whether a time series variable is non-stationary. A stationary time series is one whose statistical properties such as mean, variance, autocorrelation, etc. are all constant over time. If there is a unit root then series are non-stationary.

For the purpose of this study, we have performed the Augmented Dickey-Fuller (ADF) test. This test is an augmented version of the Dickey-Fuller test for a larger and more complicated set of time series models for testing I (1) versus I (0). The null hypothesis here is H_0 : Data series have a unit root.

The testing procedure for the ADF test is applied to the model:

$$\Delta y_t = \alpha + \beta_t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t$$

The logic of the test is that if the series is not integrated then the lagged level of the series ($y_t - 1$) will provide no relevant information in predicting the change in y_t besides the one obtained in the lagged changes (Δy_{t-k}). In that case the $y=0$ null hypothesis is not rejected.

The next tables are presenting the Dickey-Fuller test for the three different variables for Bulgaria

Table 4: Dickey-Fuller test for Bulgarian GDP – I(1)

Null Hypothesis: GDP_B has a unit root		
Exogenous: Constant		
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.115470	0.2395
Test critical values:	1% level	-3.546099
	5% level	-2.911730
	10% level	-2.593551
*MacKinnon (1996) one-sided p-values.		

Performing the Dickey-Fuller test for the unit root in case for GDP in Bulgaria (I(1)), we do not reject the null hypothesis and series have a unit root, they are non-stationary.

Table 5: Dickey-Fuller test for Bulgarian GDP – I(0)

Null Hypothesis: D(GDP_B) has a unit root		
Exogenous: Constant		
Lag Length: 2 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.272554	0.1842
Test critical values:	1% level	-3.552666
	5% level	-2.914517
	10% level	-2.595033
*MacKinnon (1996) one-sided p-values.		

Here I(0), we also do not reject the null hypothesis, and series and non-stationary.

Table 6: Dickey-Fuller test for Bulgarian Inflation – I(1)

Null Hypothesis: I_B has a unit root		
Exogenous: Constant		
Lag Length: 4 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.261877	0.6410
Test critical values:	1% level	-3.555023
	5% level	-2.915522
	10% level	-2.595565
*MacKinnon (1996) one-sided p-values.		

Concerning the Inflation rate in Bulgaria, we do not reject the null hypothesis and the series again are non-stationary.

Table 7: Dickey-Fuller test for Bulgarian Inflation – I(0)

Null Hypothesis: D(I_B) has a unit root		
Exogenous: Constant		
Lag Length: 3 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.557541	0.0000
Test critical values:	1% level	-3.555023
	5% level	-2.915522
	10% level	-2.595565
*MacKinnon (1996) one-sided p-values.		

Here, for I(0), the probability is below 5%, so we reject the null hypothesis and the data series are stationary.

Table 8: Dickey-Fuller test for Bulgarian Interest rate – I(1)

Null Hypothesis: INT_B has a unit root		
Exogenous: Constant		
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.383911	0.9047
Test critical values:	1% level	-3.546099
	5% level	-2.911730
	10% level	-2.593551
*MacKinnon (1996) one-sided p-values.		

Performing the Dickey-Fuller test for the unit root in case of interest rates in Bulgaria (I(1)), we do not reject the null hypothesis and series have a unit root, they are non-stationary.

Table 9: Dickey-Fuller test for Bulgarian Interest rate – I(0)

Null Hypothesis: D(INT_B) has a unit root		
Exogenous: Constant		
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.407087	0.0000
Test critical values:	1% level	-3.548208
	5% level	-2.912631
	10% level	-2.594027
*MacKinnon (1996) one-sided p-values.		

For I(0), the probability is below 5%, so we reject the null hypothesis and the data series are stationary.

The next tables are presenting the Dickey-Fuller test for the three different variables for Romania

Table 10: Dickey-Fuller test for Romanian GDP – I(1)

Null Hypothesis: GDP_R has a unit root		
Exogenous: Constant		
Lag Length: 1 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.414280	0.5692
Test critical values:	1% level	-3.548208
	5% level	-2.912631
	10% level	-2.594027
*MacKinnon (1996) one-sided p-values.		

In the case of GDP of Romania, we do not reject the null hypothesis and series have a unit root, they are non-stationary.

Table 11: Dickey-Fuller test for Romanian GDP – I(0)

Null Hypothesis: D(GDP_R) has a unit root		
Exogenous: Constant		
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.439321	0.0007
Test critical values:	1% level	-3.548208
	5% level	-2.912631
	10% level	-2.594027
*MacKinnon (1996) one-sided p-values.		

Concerning the I (0), we reject the H_0 , and series are stationary, with no unit root.

Table 12: Dickey-Fuller test for Romanian Inflation – I(1)

Null Hypothesis: I_R has a unit root		
Exogenous: Constant		
Lag Length: 4 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.309717	0.0000
Test critical values:	1% level	-3.555023
	5% level	-2.915522
	10% level	-2.595565
*MacKinnon (1996) one-sided p-values.		

Concerning the Inflation in Romania, there is no unit root and series are stationary.

Table 13: Dickey-Fuller test for Romanian Inflation – I(0)

Null Hypothesis: D(I_R) has a unit root		
Exogenous: Constant		
Lag Length: 6 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.925531	0.3184
Test critical values:	1% level	-3.562669
	5% level	-2.918778
	10% level	-2.597285
*MacKinnon (1996) one-sided p-values.		

In this case of inflation rate in Romania (I (0)), we do not reject H_0 , which means that there is a unit root problem.

Table 14: Dickey-Fuller test for Romanian Interest rates – I(1)

Null Hypothesis: INT_R has a unit root		
Exogenous: Constant		
Lag Length: 1 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.218455	0.2021
Test critical values:	1% level	-3.548208
	5% level	-2.912631
	10% level	-2.594027
*MacKinnon (1996) one-sided p-values.		

Performing the Dickey-Fuller test for the unit root in case of interest rates in Romania (I(1)), we do not reject the null hypothesis and series have a unit root, they are non-stationary.

Table 15: Dickey-Fuller test for Romanian Interest rates – I(0)

Null Hypothesis: D(INT_R) has a unit root		
Exogenous: Constant		
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.476381	0.0000
Test critical values:	1% level	-3.548208
	5% level	-2.912631
	10% level	-2.594027
*MacKinnon (1996) one-sided p-values.		

In case of I(0), there is no unit root and series are stationary.

The next tables are presenting the Dickey-Fuller test for FYROM for the three different variables.

Table 16: Dickey-Fuller test for Macedonian GDP – I(1)

Null Hypothesis: GDP_F has a unit root		
Exogenous: Constant		
Lag Length: 4 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	0.750534	0.9922
Test critical values:	1% level	-3.555023
	5% level	-2.915522
	10% level	-2.595565
*MacKinnon (1996) one-sided p-values.		

Performing the Dickey-Fuller test for the unit root in case for GDP in FYROM (I(1)), we do not reject the null hypothesis and series have a unit root, they are non-stationary.

Table 17: Dickey-Fuller test for Macedonian GDP – I(0)

Null Hypothesis: D(GDP_F) has a unit root		
Exogenous: Constant		
Lag Length: 3 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.067974	0.0023
Test critical values:	1% level	-3.555023
	5% level	-2.915522
	10% level	-2.595565
*MacKinnon (1996) one-sided p-values.		

Concerning I(0), we have probability below 5%, so we reject the null and the data series are stationary.

Table 18: Dickey-Fuller test for Macedonian Inflation – I(1)

Null Hypothesis: I_F has a unit root		
Exogenous: Constant		
Lag Length: 2 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.937183	0.0033
Test critical values:	1% level	-3.550396
	5% level	-2.913549
	10% level	-2.594521
*MacKinnon (1996) one-sided p-values.		

Implementing the test for the inflation rates in FYROM, we can see from the probability that we reject the null hypothesis and can conclude that the data series are stationary, there is no unit root.

Table 19: Dickey-Fuller test for Macedonian Inflation – I(0)

Null Hypothesis: D(I_F) has a unit root		
Exogenous: Constant		
Lag Length: 0 (Automatic based on SIC, MAXLAG=10)		
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-9.814947	0.0000
Test critical values:	1% level	-3.548208
	5% level	-2.912631
	10% level	-2.594027
*MacKinnon (1996) one-sided p-values.		

There is no unit root for I(0) in case of inflation rate in FYROM.

Table 20: Dickey-Fuller test for Macedonian Interest rate – I(1)

Null Hypothesis: INT_F has a unit root		
Exogenous: Constant		
Lag Length: 8 (Automatic based on SIC, MAXLAG=10)		
		t-Statistic
		Prob.*
Augmented Dickey-Fuller test statistic		
		-0.739774
		0.8271
Test critical values:	1% level	-3.565430
	5% level	-2.919952
	10% level	-2.597905
*MacKinnon (1996) one-sided p-values.		

When we analyze the interest rates, we can see that there is unit root, we do not reject the null hypothesis, so the data sets are non-stationary.

Table 21: Dickey-Fuller test for Macedonian Interest rate – I(0)

Null Hypothesis: D(INT_F) has a unit root		
Exogenous: Constant		
Lag Length: 7 (Automatic based on SIC, MAXLAG=10)		
		t-Statistic
		Prob.*
Augmented Dickey-Fuller test statistic		
		-4.809142
		0.0002
Test critical values:	1% level	-3.565430
	5% level	-2.919952
	10% level	-2.597905
*MacKinnon (1996) one-sided p-values.		

We cannot conclude the same for I(0), which means that there is stationarity.

4.3 Cointegration

Cointegration is an econometric method for testing the correlation between non-stationary time series variables. If two or more series are themselves non-stationary, but a linear combination of them is stationary, then the series are said to be cointegrated. For example, a stock index and the price of its associated futures contract move through time, each roughly following a random walk. Testing the hypothesis that there is a statistically significant connection between the future price and the spot price could now be done by finding a cointegrating vector. If such a vector has a low order of integration it can signify an equilibrium relationship between the original series, which are said to be cointegrated of an order below one.

If we have two non-stationary time series X and Y that become stationary when differenced (these are called integrated of order one series, or I(1) series; random walks are one example) such that some linear combination of X and Y is stationary (I(0)), then we say that X and Y are cointegrated. In other words, we can think of cointegration as describing a particular kind of long-run equilibrium relationship.

Cointegration is an equilibrium relationship between time series that individually aren't in equilibrium and it's useful because it allows us to incorporate both short-term dynamics (deviations from equilibrium) and long-run expectations (corrections to equilibrium). The superior test for cointegration is Johansen's test. This is a test which has all desirable statistical properties. This test permits more than one cointegrating relationship.

In case of Bulgaria, all variables that are level stationary.

Table 22: Johansen's test for Bulgarian variables

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.363788	34.92906	29.79707	0.0117
At most 1	0.132905	8.700090	15.49471	0.3939
At most 2	0.007367	0.428881	3.841466	0.5125
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				

After performing the Johansen test, we can conclude that the variables seem to be cointegrated at the 5% significance level, revealing the existence of a long-term relationship among the variables.

Romania, on the other hand, has only GDP and Interest Rate series that are stationary at levels, so we can run a cointegration test for the two.

Table 23: Johansen's test for Romanian variables

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.144309	14.36918	15.49471	0.0733
At most 1 *	0.087802	5.330112	3.841466	0.0210
Trace test indicates no cointegration at the 0.05 level				

Results show that there is no cointegration between the two variables.

Taking into analysis FYROM, variables that are level stationary are GDP and Interest Rates.

Table 24: Johansen's test for Macedonian variables

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.218693	14.47317	15.49471	0.0708
At most 1	0.002747	0.159525	3.841466	0.6896
Trace test indicates no cointegration at the 0.05 level				

Results show that there is no cointegrating vector between the GDP and the Interest Rates.

4.4. Granger Causality

Granger causality is a statistical model of causality that is based on forecast. Conferring to Granger causality, if a indicator X_1 "Granger-causes" a indicator X_2 , then past values of X_1 should contain information that helps predict X_2 above and beyond the information contained in past values of X_2 alone. All Granger Causality tests are run at 5% significance level and have as H_0 : Variable X does not Granger cause Variable Y.

We use the Granger Causality statistical model for the three countries. The Granger causality test for Bulgaria is implemented for GDP, Inflation and Interest rates.

Table 25: Granger Causality statistical model for Bulgaria

Null Hypothesis:	Obs	F-Statistic	Probability
I_B does not Granger Cause GDP_B	58	4.47401	0.01602
GDP_B does not Granger Cause I_B		1.77320	0.17971
INT_B does not Granger Cause GDP_B	58	1.74676	0.18422
GDP_B does not Granger Cause INT_B		4.13078	0.02152
INT_B does not Granger Cause I_B	58	1.30687	0.27925
I_B does not Granger Cause INT_B		7.13381	0.00180

The Granger Causality test in case of Bulgaria shows that there is only one-way causality from Inflation to GDP and interest rates, and also from GDP to interest rates.

The Granger Causality test for Romania is showing slightly different results

Table 25: Granger Causality statistical model for Romania

Null Hypothesis:	Obs	F-Statistic	Probability
I_R does not Granger Cause GDP_R	58	3.38263	0.04144
GDP_R does not Granger Cause I_R		0.29220	0.74781
INT_R does not Granger Cause GDP_R	58	3.57278	0.03503
GDP_R does not Granger Cause INT_R		0.88314	0.41948
INT_R does not Granger Cause I_R	58	0.98248	0.38109
I_R does not Granger Cause INT_R		12.0055	5.0E-05

The Granger Causality test shows that there is only one-way causality between the variables. In particular, in Romania, there seems to be one-way causality from inflation to GDP and interest rates, and interest rates to GDP.

Granger Causality test for FYROM is showing the following results

Table 25: Granger Causality statistical model for FYROM

Null Hypothesis:	Obs	F-Statistic	Probability
I_F does not Granger Cause GDP_F	58	0.65327	0.52448
GDP_F does not Granger Cause I_F		1.13920	0.32779
INT_F does not Granger Cause GDP_F	58	0.67209	0.51494
GDP_F does not Granger Cause INT_F		4.25464	0.01934
INT_F does not Granger Cause I_F	58	0.12973	0.87861
I_F does not Granger Cause INT_F		3.35523	0.04246

There is no case of two-way Granger causality between any of the variables. However, there seems to be one-way causality between specific variables, in particular: GDP and interest rates (GDP Granger causes rates) and inflation and interest rates (inflation leads rates).

5. CONCLUSION

The three countries that we analyze in this paper are not part of the Euro zone. Bulgaria and Romania are part of the European Union, and FYROM is still in the negotiation process. They have significant economic improvements during the period that we are covering in the paper (2000 – 2014), with significant lag behind other European developed countries part of the EU and Eurozone. Concerning their national currencies, Bulgaria fixed the lev to the deutschmark (and now also to the euro). The exchange rate of the domestic currency with the euro in Romania has remained generally stable, with moderate changes in periods. FYROM has the domestic currency which exchange rate is fixed to European currency.

Our target period is from 2000 until present time, offering both a relatively positive first period until the arrival of the debt crisis by the end of the 2000s, leading to strict austerity and deflationary gaps in most countries. We took this period due to the enormous changes that have taken place in the domestic market and the global economy. Some of the fluctuations for these countries have the impact to change the whole path of their economic development. So, in this paper we took this period in order to investigate if and how this affected the macroeconomic stability and economic development of these countries.

There is not a significant difference concerning the obtaining results compared to other researches. From our findings we can conclude that there is an impact of interest rate and inflation on GDP (with different signs) concerning the three countries.

From the correlation matrixes we can conclude that in Bulgaria, both inflation and interest rates have a small negative correlation against the GDP of the country. Inflation and interest rates in this country have a positive correlation revealing a relatively strong relationship between the two variables, in accordance with basic monetary policy. Inflation and interest rates in Romania have a negative correlation against GDP but at significantly larger values than Bulgaria. Equally strong is the correlation between interest rates and inflation, which reaches almost the perfect positive correlation level which could be a sign of a monetary policy that follows closely the changes of the price levels in the country during the period 2000-2014. Inflation to GDP correlation in FYROM is relatively non-existent, revealing a very weak relationship between the two variables. On the contrary, interest rates to GDP have a negative correlation. The interest rates and inflation in this country are weakly correlated, showing that the monetary policy of the country does not closely monitor changes in the prices levels.

We use unit root test to find whether a time series variable is non-stationary. For the purpose of this study, we have performed the Augmented Dickey-Fuller (ADF) test. From the test performed for the three countries, we can conclude that in case of Bulgaria, we do not reject the null hypothesis and series have a unit root, they are non-stationary for the three variables GDP, inflation and interest rates. In case of Romania, there is a stationarity just with inflation, and other two variables (GDP and interest rate) and non-stationary. The same conclusion as for Romania about the stationarity can be implemented in FYROM.

We used Johansen's test to investigate the cointegration for the variables that are level stationary. From the test we can conclude that in case of Bulgaria, the variables seem to be cointegrated at the 5% significance level, revealing the existence of a long-term relationship among the variables. Concerning Romania and FYROM, there is no cointegrating vector between GDP and interest rates for both countries.

The Granger Causality test in case of Bulgaria shows that there is only one-way causality from Inflation to GDP and interest rates, and also from GDP to interest rates. In particular, in Romania, there seems to be one-way causality from inflation to GDP and interest rates, and interest rates to GDP. Implementing the same test for FYROM variables, there seems to be one-way causality between GDP and interest rates and inflation and interest rates.

Further analysis in the future could take into consideration the special characteristics of each country's variables as well as the different monetary and fiscal policies used. To this effort, additional variables could also be introduced to the analysis, such as net exports or individual GDP figures (C, I, G) in order to reveal more detailed patterns in the relationships of these variables to interest rates and inflation. Furthermore, since the statistical tests applied (ADF, Johansen and Granger causality) are lag-sensitive, a further experimentation with various time lags could probably discover different patterns.

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FAMILY BUSINESS CHARACTERISTICS AND DIFFERENCES: SOME INSIGHTS FROM THE DEVELOPING COUNTRIES

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ABSTRACT

Empirical research indicates that family and non-family businesses manifest differences in certain aspects of their work, such as: perceptions of external and internal environment, strategic orientation, organizational vision and culture, competitiveness, managing human resources, financing, etc. The purpose of the paper is to determine what can be considered as a family business consequently to their general and specific features, and thus providing a consistent basis for further deeper research of family business in developing countries, particularly in former socialist countries. The general hypothesis of the research is that family business could be differentiated for non-family business considering general and specific characteristics. The results provided in the paper discover that family business distinguish themselves from non-family business according to the following characteristics: size of business, age, industry where the main activities are executed, the level of education of the owner and growth strategies. The study involves more than 300 companies from different industries covering many different locations in Republic of Macedonia. Theoretical implications of this paper are in the direction of development of the literature related to the field of family business, especially in the part of empirical research and as well the conditions of family business in developing countries, particularly in ex socialist countries. At the same time the provided research of family business has strong practical implications, indicating supporting processes for competitiveness, growth and raising awareness of owners-founders of these businesses, on the path to advancing the sophistication of their business processes and transferring the necessary knowledge and competences to next generations.

1. INTRODUCTION

Family businesses are being recognized by their significant economic presence throughout history. Family businesses are among the longest-lived, most prevalent institutions in the world (Astrachan, 2010). According to the European Family business statistics for 2012 an estimated 70%-90% of global GDP annually is created by family businesses. The vast impact of family business is further proved by the creation of 50%-80% of the jobs in the majority of countries worldwide, also 85% of start-up companies are established with family money. Estimations indicate that in most countries around the world, family businesses are between 70 and 95% of all business entities (European Family Businesses, 2012).

The field of researching family business starts in 1975 when the entrepreneur, educator for family business and consultant Leon Danco publishes his pioneering paper titled: *“Beyond survival: a business owner’s guide for success”*. Nevertheless in the period between 1975 and the 90’s the majority of published papers related to family business are subjective, embedded in the stories of consultants and researchers, since family business are quite closed for providing information. General disappointment related to the performance and ethics of a number of capital markets, have led some researchers to question whether the business model of the family firm, which had been largely written off as a relic from the past, might be a valuable model after all.

The past few decades’ research related to family business has predominantly struggled with defining family business and their main characteristics. Despite various definition in literature provided by many researchers related to family business it can be stressed that there is no general agreement to what should be considered as a family business. Defining the unique differences between family firms and non-family firms can be used to explain the conceptual and operational definitions of family firms. Overall, the majority of research on family firms in the past decade or so has been directed toward the individual or group levels, with only scant recent interest in the organizational level. Topics such as organizational vision and culture development, marketing strategies used, human resource practices, inter organizational relationships, and so forth remain unstudied (Sharma, 2004).

Even though no statistical evidence are complete enough to map the presence of family businesses worldwide, however many studies conducted in different countries have confirmed the weight these businesses carry in national economies (Astrachan, Shanker, 2003). Research studies suggest that background settings are playing critical roles in defining governance of family business and regulating their performance impacts. The opposing discussions in literature have triggered the interest to find better understanding related to family business also in developing countries, especially with reference to the former socialist countries. Several studies have suggested that family enterprises are emerging as the central force driving economies in these countries (Duh, Tominc, 2005; Pistrui et al., 1997; Poutziouris et al., 1997; Aksentijević, Bogović 2001; Vadjal, 2005). Most of the former Yugoslavian countries have experienced transition from a closed economy to an open market economy, which has made a strong impact on the development of the business segment in general.

Another problem associated with the research of family business is inconsistency. The inconsistency related to the comparison of family and non-family business could be justified by a number of reasons. It could be linked to the methodological approach which might influence the overall findings, again related to defining the family business. Differing criteria introduced across countries, related to various research projects results in discrepancy among findings. Very often companies are counted as family companies based on the individual

perception of the founder, which often could be embedded in his/her ambitions in the long run. However, family firms behave and perform differently when operating in countries with different institutional environments (Steier, 2009). In most former Yugoslavian countries the definition of family business is attained to the law defining the main types of business concerning size, family business being in the group of small, medium and micro businesses. Within most former Yugoslavian countries there is no accepted family business definition and official statistical data could almost be considered nonexistent. Estimations are provided based considering micro, small and medium sized business. Since the raise of private capital in the early nineties' most of the companies considering themselves as family business, nowadays are experiencing or about to experience their first succession. Family business is lacking a clear definition both in developed and developing countries.

Bearing in mind the above mentioned problems which are imposed by the research of family business, such as: the definition of family business, identifying their characteristics, the limited research related to these issues in the developing countries, especially in former socialist countries, as well as the methodological inconsistency of research could determine the main objective of research. The main research objective related in this study is embedded in identifying the general and specific characteristics of family business in the Republic of Macedonia. The general marks are withheld from the demographic structure of family business, whereas the specific characteristics should be determined by the differences in the performance considering different dimensions in family and non-family business. The general hypothesis of the research is that family business could be differentiated for non-family business considering main general and specific characteristics. Through the research results, this paper aims to determine what can be considered as a family business consequently to their general and specific features, and thus providing a consistent basis for further deeper research of family business in developing countries, particularly in former socialist countries.

The study involves more than 300 companies from different industries covering many different locations in Republic of Macedonia. The data was processed and analyzed using hierarchical regression analysis. Empirical research specifies family and non-family businesses in certain aspects of their work, such as: growth (stages of growth), types of strategies, executing strategy (internal constrains), external environment (external constrains), aspects related to planning, performance etc.

2. LITERATURE REVIEW

2.1. Understanding the concept of family business

Many authors have been struggling to set a clear definition related to family business across countries and at the same time being the starting point for any research paper. In general, family businesses are the basis for meeting some needs of family members. As the spouse of the founder of the company participates in the early stages of the establishment of a new business venture, the actual transition from entrepreneurial to the family business usually occurs when the children of the founder of the company are included in the work as employees (Poza, 2010). In this direction, the definition of the family business implies to a business that will be transferred to the next generation in the same family, which will manage and operate it (Ward, 1987). Family businesses differ from other types of star-ups due to the different combination of intensifying complex processes within an enterprise. There are some findings that family businesses according to theory are distinguished from other companies because of the influence of altruism in the relationship between shareholders and management. The authors of this study argue that family businesses are differentiated because

of the active involvement of the family in the management of the company and the intention of the members of the family to retain ownership in the enterprise (Schulze et al., 2001). It should be noted that the definition of the concept of family and the extent to which it is expressed in business is a very complex issue, making it impossible to be condensed into a common simplified definition. In their comprehensive analysis of the family business Christman, Chua, and Sharma, found twenty-one different definition in terms of the family business in the survey of more than 250 papers (Sharma et al., 1996).

However within the traditional definition of family business certain modern trends imposed by modern living are not included. Namely, it should be noted that there are all kinds of businesses that are operated by divorced couples and other social forms that involve members of the same family. In that context the definition of family business gets significantly a wider context. A very broad definition is that as a family business should be considered any company whose operations are strongly influenced by the relations of one family. This however is too broad and leaves space for misunderstandings. There are many issues that influence the definition of family businesses. Some of these issues are related to family members being employees of the company as a precondition for such to be treated as a family business, furthermore issues related to the extent of property held by family members and also issues whether the company has went through any succession process. According to Handler (1989), the development of the definition for family business from a historical point of view took place through three dimensions: ownership, involvement of family members and the transition between generations, as well as the combination of these parameters.

The family is the natural fundamental unit of society, which is under the protection of the society and state. On the other side business can be considered as the basic legal unit organized in an economically free society, where individuals are organized based on their expertise and skills, social and technological progress. The reasons for the existence of the family and the business are fundamentally different. The primary purpose of the family is the care and cultivation of its members, while the business is engaged in production and distribution of goods and / or services. The objectives of the family are associated with the maximum possible development of all members, regardless of their limitations in terms of skills, at the same time providing equal opportunities and rewards for all members, whereas the purpose of business is profitability and survival. The existence of family relationships gives emotional overtones and they dramatically complicate the process of reviewing the work of employees. The everlasting dilemma rises what should be prioritized, the family or business. From an ethical point of view there is a strong acceptance by owners that family should come first, and there are rather small group of owners who knowingly would allow the business to destroy their family. But in practice, the resolution of this tension is difficult and complex. To achieve growth, family businesses need to recognize that professional management is required and that the interests of the family in certain situations should be subordinated. There are a number of formal and informal elements that affect the family business, where there is a parallel process of decision-making associated with a family, and the other business.

The uniqueness of the family business is attributed to the different impact of the family on the part of the ownership, management, governance and participation through strategic guidance, direct involvement in the daily activities and / or retention of control of voting (Astrachan et al., 2002). The combination of both family and business aspects cause large mixtures, overlaps that may result in conflict, misunderstanding and confusion, and to a large extent complexity. The large number of dimensions that are intertwined in family businesses

lead to mutual connection in different aspects, so that connection often helps in determining whether the company can be listed in order of family businesses or not.

2.2. Family business in Southeast Europe in developing countries

Even though no statistical evidence are complete enough to map the presence of family businesses worldwide, however many studies conducted in different countries have confirmed the weight these businesses carry in national economies (Astrachan, Shanker, 2003). Research studies suggest that background settings are playing critical roles in defining governance of family business and regulating their performance impacts. Studies related to family business issues in former socialist countries are scarce. One of the main reasons is the fact that private companies were outlawed during the era of the socialist economy. Due to the social and economic changes in Central and Eastern Europe in the early 1990s opportunity for the rebirth of entrepreneurship and also family business development have been created. (Duh et al., 2003). In most former Yugoslavian countries as socialist countries, family business or any private venture were very limited mainly present in the crafting segment, which was not considered as very attractive and mainly had not a very favorable image. With the transition to an open market economy in the early nineties almost all of the former Yugoslavian countries experienced growth and development of private equity. In this context the number of small businesses grew which also includes family businesses. Evidently family business has witnessed his development in the last 20 years, especially considering developing countries. However still many of these family business are very young and are facing issues which are in the literature already discussed .Still the influences of the country historical development could not be diminished and every serious research should take into discussion the various country related aspects, such as social , political and legal factors.

Many authors worldwide have analyzed differences between family and non-family companies considering different performance measures such as size, age, debt, industry, performance, profitability, job creation, growth, strategies, organizational outcomes, (Westhead, Cowling 1997; Beehr, Drexler, Faulkner 1997, Anderson, Raab 2003, Chrisman, Chua, Litz 2004,). However, family firms behave and perform differently when operating in countries with different institutional environments (Steier, 2009). It is considered that developing countries have different implications related to the performance of family business. However most of the mentioned analysis is related to developed economies, whereas in developing countries studies and research is limited. Only a few studies could be notified related mostly to countries such as Poland, Romania and Slovenia. (Poutziouris et al. 1997; Duh 2003; Dyer, Panicheva Mortensen, 2005) mainly focusing on the importance, definition and characteristics of family business.

2.3. Dimensions of family business

The main indicator for distinguishing family business is the fact that managers and employees share family connections, values, and ethics and behavioral patterns which more or less are transferred or at least shared at work. Therefore those aspects brought from the family are simultaneously mixed with business and eventually form the grounds for potential misunderstandings, problems and conflicts. According to the most prominent three-circle model suggested by Tagiuri, Davis, 1996, in the family business exist three separate areas: 1) the business system, 2) the ownership/governance system, and 3) the family system. These three overlapping systems are the foundation for the complexity in which family business differentiates itself from other companies.

Literature as indicated often turns to comparing family vs. non family business in order to determine the distinctive characteristics of family business. Different authors have investigated the main characteristics of family versus non-family business. Anderson and Reeb (2003) for instance analyzed a sample of 403 S&P 500 companies in order to investigate if the performance of family and nonfamily firms differs and whether these potential differences are a function of the age of the firm, level of family ownership, or family status of the CEO. Their main contribution is related to providing one of the first assessments of the performance of large, publicly traded family and nonfamily firms and thereby providing initial clues on the relative importance of managerial and owner opportunism. The analysis is based on using profitability-based measures of performance (ROA) as well as market-based measures of firm performance. The fractional equity ownership of the founding family and (or) the presence of family members on the board of directors is used in order to identify family firms.

Furthermore Coleman, Carsky, 1999 discuss the main question related to financing small family owned business. These authors' present differences among family and non-family businesses related to export, budgeting, variable reward systems, profitability and gender, educational degree, and tenure of the CEO where there are some distinctions are implicated. However it is very interesting that according their research the following aspects such: strategy, networking, long-term planning and control systems, perceived environmental uncertainty, growth, and management training; could not be differentiated in family and nonfamily firms, meaning that there could not be withdrawn any special characteristics according to this aspects. Gudmundson, Hartman, & Tower (1999) also discuss the differences between family and non-family business whereas their research is oriented towards examining the relationship between ownership structure and strategy. These authors (Gudmundson et al., 1999) empirically examined the relationship and some differences on how family businesses compete in the marketplace. Other authors contribute by making a comparison of small business which have family participation versus small business without family participation. (Lee, Rogoff, 1996). Their research is mainly focused on distinguishing the differences in goals, attitudes, and family/business conflict. The discussion within this research also considers whether family involvement could raise conflicts which could be considered as a serious weakness in terms of business performance. The findings of Lee and Rogoff indicate that there is no overall difference in business-related goals between the two groups, but still family business do experience significantly more business-family conflict.

On the other side Littunen, H. (2003) aims to distinguish which factors associated with the start-up and critical operational phase of family and nonfamily companies, influence the ability of those firms to survive over the critical first three years of their existence, focusing on Finnish companies. In this context the author makes an attempt to distinguish the motives for founding the firm, characteristics of the local environment, changes in strategic factors, changes in networks, and differences in style of management. Any analysis of family business could not overlook the study of Westhead, Cowling and Howorth, (2001), where research mainly explores management and ownership implications in order to detect differences. Some dimensions discussed within their research are the tenure periods of CEOs, the influence of the kinship related to the duration of the position of the CEO, the proportions owned by directors and etc.

In literature (Zahra et al., 2004) the relationship between family companies cultures and entrepreneurship are examined by comparing the influence of dimensions of culture on entrepreneurship in family and non-family firms. This study examines four dimensions that are expected to be associated with entrepreneurship in family firms: individual versus group

orientation; an internal versus an external orientation; assumptions concerning the centralization/decentralization of coordination and control; and short-versus long-term orientation.

From the research of different factors in literature of family business, the following general and specific factors could be stressed as particularly important in determining the nature of family business:

Size

In order to determine the size of a company, very often the number of employees is discussed. Referring to agency managers' which act in self-interest, seeking personal achievement at the expense of firm profits, it could be stated that professionally managed or nonfamily businesses would be larger than the family-owned and managed firm. It is deliberated that the nonfamily business which engages professional management should be larger than the family businesses. On the other side most small business are considered as modern employment generators, accordingly some studies find evidence that family businesses show higher employment creation than non-family businesses (Backes-Gellner, 2001). Confirmation is indicated also by other authors (Ward, 2004) so family owned businesses are recognized as an important source of wealth creation and employment growth. Despite the common perception that family business is considered to be in most cases small business, it could be stressed that the largest companies are indeed family business. Companies such as Cargrill, Bosch, Volkswagen, BMW, Fiat, Ford, Bosch are family owned and controlled.

Industry

The industry where the company is active determines to a large extent the process in every company and especially in small companies. The intensity of industrial diversity influences the results per industry, and empirical results usually comes to conclusions that there are significant differences among industries related to the performance and development of the company. Literature suggests that most of the research includes companies from different industries and very often the results of family and non-family business are differing. Consequently it is expected findings to reflect differences in the performance of family and non-family business related to different industries reflecting simultaneously the specifics of each industry. For instance a breakdown of different industries for the family and non-family business sectors often is subject to analysis. According to some relevant data in UK, (Oxford Economics, 2011), the comparison of the breakdown for the respective sectors industries indicates that family firms' turnover is relatively more concentrated in wholesale and retail trade ,41% compared to 31% and construction 11% compared to 6%, while non-family firms' revenues are more concentrated in manufacturing 19% compared to 12%. There is a clear tendency which indicates differences in the preferences and engagement in one industry of family vs. non family business.

Another aspect is that compensation is often based upon size and growth considerations, which means that managers are often paid in relation to the size of their organization, not its profitability. The larger size of the firm may justify higher wages for professional managers (Gomez-Mejia et al., 1987). Considering the size issue it is evident that only growth can generate new opportunities for professional managers. The growth of the firm will create different positions which shall create new possibilities for promoting the managers. This perception is not usually shared in the family business, which very often even do not have any plans to grow in size.

Family firms often need only grow at a pace consistent with meeting the advancement needs of organizational members in the family system (Daily, Dollinger, 1993).

Age

Common perception is that professionally managed companies are usually older and more established than the family business. Most of the non-family businesses are professionally managed and are not dependent upon the succession process whereas family business fail to survive the first generation. According to the research conducted by Stoy Centre for Family Business (1997) family businesses were much more likely to be older than non-family business. Further research indicates opposing results so some initial studies state that the life expectancy of family business is 24 years (Alcorn,1982), implying that family are less likely to outlive non-family business, which again is connected to a low survival rate. (Westhed, Howorth, 2006) and given the trans-generational nature of many family businesses, one would expect family businesses to be older. Age proposes succession and in that light it is discussed that family business are considered to be older. It could be viewed that there are contrasting discussions related to the influence of age in family and non-family business, but still it could be pointed out that age of the business does reflect certain influence. The long-term nature of family proposes that external groups, such as suppliers or providers of capital, are more likely to deal with the same governing bodies and practices for longer periods in family businesses than in nonfamily business. However notwithstanding their stronger growth, no evidence is found that family firms are less stable than other firms in the long run (Lee, 2006).

Growth

Growth is a complex issue which could be connected to performance, size and revenue change quite clearly. It is very often hard to measure and acknowledge growth, since it could be considered as a simple “change of the amount” or an improvement on certain aspects in the business. Literature which considers growth in small businesses, mostly relates to empirical research determining the level of growth reached, witnessing the existence of substantial and qualitative difference in respect to the way that business achieve growth (McKelvie, Wiklund 2010). According to some authors (Gallo, et al.1995) family business have difficulties in sustaining growth. Manly family businesses grow more slowly, or do not want to grow as much as they could if they used all the available resources. The ability to grow is very often associated with the quality of entrepreneurial tradition and ability to pass it from one generation onto the next one (Lumpkin, Sloat, 2001) which could be especially challenging in family business. Very often it is proposed that family business generate lower growth rates which could be rooted in the traditional approach towards innovation (Moores, Mula, 1998) as well as other aspect related to operational activities in family business. Daily, Dollinger (1993) suggested that family managed firms lean towards being smaller, younger, less formalized and growth-oriented, displaying less “entrepreneurial” characteristics. Furthermore Hufft (1997) observed the ownership structure of small firms compared to their growth potential. His observations show that non-family firms tend to grow faster than family-controlled firms, while on the long run there was no significant difference. Also McMahon (2003) argues that growth is simply a consequence of the implemented financial decisions and suggests that encouraging comprehensive financial planning expertise, could be contributing in encouraging the growth perspective of family firms. The main idea for the existence of any company is generation revenue and profit maximization. This could be connected to the weaker orientation of family business towards growth and following a slow pace towards achieving growth. Research presents evidence (Binder, 1994) that non-family business

outperformed family businesses considering revenue growth. However, opposite results have also been reported by others with regards to revenue growth and profit growth and some studies conclude that the differences between family business and non-family business are not significant with regards to turnover and profitability (Westhead, Cowling, 1997). From a revenue growth perspective, growth strategies are usually included such as increasing revenues from new markets, new products and new customers or increasing sales to existing customers.

Ownership

Ownership is one of main aspects which differentiates family vs. non family business, and therefore the strongest aspect influencing the family business. There are some studies explicitly investigating the influence of family ownership on the performance of small and medium sized businesses (McCann et al. 2001; Lee, 2004, Mc Conaughy et al. 2001). Holding significant ownership of cash flow rights, founding families have the incentives and power to take actions at the expense of company performance, as long as the benefits of the family are considered. Founding families also face reputation concerns arising from the family's sustained presence in the command of the company in comparison to third parties. Therefore, a proper analysis of management of family businesses requires an understanding of the role played by the family as a social system, and the way in which it exerts its influence on the firm by virtue of ownership (Poutziouris et al.2006). The family influences the business by virtue of vested interests. After all family business is defined by the fact that a business family can exercise influence over a firm primarily because of its ownership stake (Davis, 1983). In other words, family ownership is what determines the family nature of a company (Gimeno, et al., 2005). Therefore ownership in family business is dominantly concentrated in the hands of family members, at the same time keeping the main control over the company. Even when defining the family business one of the main criteria used in distinguishing family from non-family business is ownership. Non-family business from an ownership structure differs significantly from family business in respect to strategy, operations, management, communication, employment and etc. We can even note that according to Stulz (1988) it is argued that firms with controlling block-holders exhibit higher financial leverage due to their unwillingness to dilute ownership further.

Financing

Anderson et al. (2002) suggest that one significance of families maintaining long-term presence is that the business will enjoy lower cost of debt financing compared to nonfamily business. The financing of small business in general is focused towards sources related to the personal funds of the owners and the funds provided by the closest friends and family. Family businesses tend to be "highly levered", and prefer "private to public equity financing" (Wu et al., 2007).

It is widely discussed that family businesses incorporate their desire to pass the company across generations into their financial decisions. The unwillingness to open the ownership to nonfamily members, by financing new investments, and increasing debt levels is essentially limited (Blanco-Mazagatos et al., 2007). At the same time for family business it is often the case not having the possibility to attain outside financing from banks, investors or other funds is driving the efforts towards more familiar sources of financing. Investors outside the family are often not acquainted with the potential which could make the company a success, at the same time family business is considered to be at a higher risk rate for losing the invested resources. Some authors even claim that family businesses may be at a disadvantage in obtaining access to external capital (Kets de Vries, 1993). Consequently, family business may be forced to

depend heavily on internal sources of capital, most commonly provided by family members. It is also very logical that family businesses that have both family investors and employees are more likely to be concerned with the long-term survival of the firm (Gundry, Welsch, 1994). Early empirical study proposed by relevant authors suggests a positive and significant relationship between leverage and ownership. Later according to relevant research (Poutziouris et al.2002) the most fundamental factor that discourages family firms from accepting equity financing is their fear of losing control.

Strategy

The influence of family can have a moderating impact between company strategy and performance (Chrisman et al.2008). The word strategy has been introduced based on the military vocabulary, but in business it is considered to be the “game plan” or the map on how to achieve certain competitive advantage. So it is very closely linked to the long term performance and success of the business. However family business in order to remain successful according to some research efforts (Post, 1993), remain successful implies generating a new strategy for every generation that joins the business.

The family-business literature has not come to a consent on how a family should deal, simultaneously, with the possibly conflicting strategic needs of the family and the business. There have been some suggestions but no overall statement has been made yet. Considering a strategic management perspective the family could be considered at the same time as a resource and a limitation. The literature is quiet on the suitable business strategies for different family structures and dynamics, as well as for different business situations (Sharma et al. 1997). However, if participation from non-family members is limited, groupthink could result as the strategic process is dominated by family members and non-family members are less committed to strategic decisions (Guth, MacMillan, 1986). Mostly research and analysis has been engaged in discussing strategic aspects in larger family businesses, mostly due to availability of certain information. Furthermore relevant researchers have specified the necessity to make a more thorough analysis of the strategic and competitive characteristics of small and medium family firms, as well as the factors that condition them in both financial and economic terms (Scholes et al.2010).

Performance

Discussing whether families have advantages in disciplining and monitoring managers, extended investment perspectives, and provide specified knowledge, rises questions if founding-family presence hinders or facilitate the performance making it an empirical issue(Anderson, Reeb, 2003).Contrary to the notion that family ownership is detrimental, we find stronger performance in family business than in non-family business (Faccio et al.2001).

Gimeno et al. (1997) have debated that the survival of the company to a large extent depends upon two dimensions: economic performance and threshold of performance, the latter being understood as ‘the level of performance below which the dominant organizational constituents would act to dissolve the company’. Non-economic performance factors influence company objectives and values and could include: maintaining a good work atmosphere and avoiding clashes; providing offspring: work, prestige and social recognition; financial security; a pleasant lifestyle; sense of justice, social development; and etc. Differences between family firms and non-family firms exist for a variety of reasons and are a result of different perspectives. Non-family business as an example often generate additional resources which can be used by manager overcome the consequences of poor decisions or even out variations in

performance (Sharfman, et al.1988), appearing these types of business as more efficient than they actually are.

Stage of development

Related to the performance and development of family business it could be considered that this process follows certain patterns very similar to human life cycle (Butler, 2006). The so called stage of development could determine the performance level of the family business. Therefore it could be discussed whether family and non-family business passing through the same stage of development experience differences due to the presence or absence of the family. In literature evolved different studies proposing specific stages which any small company experiences. Maybe the studies that have had the greatest influence are considered those presented by Chandler (1962), Greiner (1972) and Churchill and Lewis (1983). However despite the fact that most of these authors agree in proposing an evolutionary order, there is no agreement regarding the dimensions for defining this evolution. The variety of possible stages evolves around are three main **stages**: startup, expansion-formalization, and maturity. These though are relatively transformed and extend up to five or even seven if we consider some sub-stages which were introduced. Nevertheless the development of a business is not only putting focus on growth, but it relates usually to overall increasing complexity in the company. On the other hand Gersick et al. (1997) propose an evolutionary pattern in business families, basing their ideas on a study of family transitions and lifecycle. Family complexity can be explained by involving the lifecycles of the family and ownership.

3. DATA AND METHODOLY

3.1. The data sample

For the purposes of this research 326 questionnaires were collected, which represents 20% of the total questionnaires sent to the companies, which means that despite the large number of submitted questionnaires responsiveness rate is relatively low. Of the total questionnaires returned, after making some data screening 305 left, while 11 were rejected due to insufficient data or technical issues data. Of course, most of the family businesses are in their initial phase, small businesses and therefore much of the research is devoted to just the small enterprise.

3.2 Data gathering

After preparing the questionnaire, it was tested on couple of companies and feedback was received in order to improve and clarify some issues of potential respondents, and consequently valuable changes have been implemented. The relatively low response rate reflects also the attitude of small companies in relation to providing information, which are mainly closed in sharing company information to the outside. The questionnaire was distributed in the period between 13.05.2014 and 19.07.2014, among companies on the whole territory of the Republic of Macedonia. The approach of distributing the questionnaire implied several ways: handing printed questionnaires in person to randomly selected companies; submitting the questionnaire in an online soft copy by email, as well as uploading the questionnaire in electronic format on-line application which can be directly filled in. The questionnaire contains 26 questions, of which 9 are placed on the Likert scale with 5 positions - 1 indicates the lowest level, and 5 - the highest level of occurrence. The remaining questions

are multiple choice including several alternatives, respondents were asked to choose the best suited option according to their perception.

Whether a particular business was to be classified as “family” or “non-family” was left to the judgment of the person answering the questionnaire, which is very common, considering the extensive literature of defining family business. Of the received 305 business in the sample 207(67.86%) are family business, whereas 98 (32.13%) are non-family business.

3.3. Methodology

Hierarchical logistic regression analyses is used for examining the general characteristics (demographic structure of family business: size, age, industry, level of formal and informal education of the owner) and specific characteristics (dimensions and aspects of everyday working: strategies of growth, competitive strategies, life cycles, perception of the internal and external environment, planning, instruments of financing and performance which are considered to be even more important in differentiating family from nonfamily business.

The general model is based upon the research model of Daily and Dollinger (1992), which support the concept that family versus nonfamily businesses can be identified based on firm age, firm size, the strategic profile emphasized by the firm, as well as the use of internal control mechanisms. However the aim of this research is to include a larger scale of general and special characteristics, whereas differences would be tested among family and non-family businesses. Due to the wider reach and number of parameters included in this research and because there is a lack of research including such a number of parameters in one model, the hierarchical logistic regression is used, where in a few phases (so called blocks) are added new groups of variables to the basic model, whereby their influence is consequently tested on the dependent variable. Additional reasons for the application of this method is that hierarchical logistic regression enables to enter independent variables into the regression equation in an order chosen by the researcher. This presents a number of advantages, such as allowing control for the effects of the covariates on the results and take into account the possible causal effects of the independent variables, when predicting a dependent variable.

After the preliminary testing and executing of a number of iterations of the above mentioned variables in a hierarchical regression and testing the necessary assumptions of the logistic regression (**Linearity, Independence of errors and Multicollinearity**), 7 of the total 13 variables remained in the model.

The final model is divided in three blocks. In the first block are placed the general demographic characteristics: size, age, industry and level of education of the owner. These variables are considered as control variables, which at a large scale should determine the behavior of the rest of the variables within the model. In the second block the growth strategies and competitive strategies are placed, whereas in the third block business performance is added. It is expected that the influence of business performance will be largely determined by the second block if variables, i.e. growth strategies and competitive strategies as the most immediate predictors of business performance.

3.4. Operationalization of variables

1. Size of company

The size of the company can be measured in different ways and therefore it could differ in various studies. One of the most common indicators used for determining the size of the company is connected to the number of employees. Furthermore within our research the company had to state the exact number of employees and therefore before proceeding with further calculations values had to be logarithmically transformed in order to be normalized for further use.

2. Age of the company

The age of the company is a very common variable which is measured by the years of existence. Therefore within this study companies needed to provide the number of years the company exists presented as a continuous variable. Similar to the variable related to size this variable needs to be logarithmically transformed as well.

3. Industry

Related to the industry most research evolves around categorizing the company in different groups. This research very similar provides five options where each company needs to choose from in order to determine where it belongs to. The respondents have been asked to choose from the following options: production, services, trade, construction and other option not stated within the questionnaire.

4. Formal education of the owner

The owner strongly influences the overall development of the family business. Therefore it is considered that the level of education determines the family business in respect their performance. Within this research respondents need to provide information concerning the owner's education by implying their level of education from the five categories provided within the questionnaire (primary education, secondary education, university education, master degree, doctoral degree).

5. Informal education

The owner beside his formal education has often acquired different types of informal education, such as different trainings, qualifications and certificates which could enhance his skills and abilities. The level of informal education is measured by the average value of the three aspects each measuring the compliance of the respondents by Likert scale from 1 to 5. The highest score determines the highest level of informal education.

6. Financial instruments

The variable related to the financial instruments used for financing or considered to be used in the future is measured by five sources of possible financing, which most commonly is mentioned in the literature. The questionnaire proposes companies to choose from: credits in banks, withholding profit, loans from relatives or friends, business angels, venture capital or other not mentioned.

7. Stage of development

The stage of development of the company, as a variable is categorical and surveyed in companies by stating at what stage of development the company finds itself. The possible categories are: initial stage, survival, success stage, take-off stage and resource maturity. As a growing company and going through different stages, transformation is needed, after transforming the company goes into the next phase of configuration and growth (Churchill, Lewis, 1983).

8. Growth

Growth as a variable is determined by the average of the values provided by a Likert scale from 1 to 5 considering seven aspects of growth. Respondents needed within this variable to provide information related to the growth of the company concerning the main indicators of growth such as: income, market share, quantity of products and services, the production capacity, the product and service portfolio and number of employees. Naturally 1 determines the lowest scale and 5 the highest scale of growth.

9. External constrains

Environment plays a significant role in the company, while the external constraints are presented in the form of continuous variables that may have value in the range of 1 to 5. The scope of this variable indicates more aspects of the external environment, which may occur in the form of constraints. Finally from the values attained to seven constrains (lack of employees, fluctuations of demand, financing, legislation, political situation, growth of input prices, growth of competition) an average value is calculated which is used in further analysis.

10. Internal constrains.

The internal as the external constraints are represented in the form of continuous variables that may have value in the interval from 1 to 5, 1 representing the lowest and 5 the highest value. Moreover the average values are calculated of the 6 items that may occur as internal constraints. The resources in the enterprise largely determine the internal opportunities and constraints of small enterprises.

11. Competitive strategies. The choice of strategy is one of the central decisions, presented as a categorical variable, where companies can choose between the so-called generic strategies: cost leadership, differentiation, focus on cost leadership and focus on differentiation of products or services. This variable reflects the long-term orientation of the company towards achieving competitive advantage. Respondents can choose between the four generic strategic of Porter and also a combination of them.

12. Growth strategies

For the realization of growth, companies can choose between the following types of strategies for achieving growth: expanding the existing market, developing new markets, develop new products to market, diversification in business or out of business in which the company operates, modernization, acquisition and purchase of parts of existing enterprises. The implementation of this strategy shows the commitment and attitude of the company in terms of growth. This is a categorical variable whereby the respondents were allowed to choose a combination of these strategies as well.

13. Planning

The planning in the companies could be determined by various items which again will be evaluated according to the Likers scale from 1 to 5 (1 being the lowest intensity 5 the highest). The various statements receive their mark which will result in a final average grade used in further analysis. The variable is presented as a continuous one calculated by the grades received for the various statements.

4. EMPIRICAL ANALYSIS AND FINDINGS

4.2 Findings

Table 1. Results from hierarchical logistic regression

Variable	Model 1		Model 2		Model 3	
	Wald stat.	Exp(B)	Wald stat.	Exp (B)	Wald stat.	Exp (B)
Size_log	3.903**	0.752	2.476	0.779	2.710*	0.768
Age_log	10.155**	1.726	9.367**	1.748	9.667**	1.769
Industry (1)	2.663*	0.534	3.877**	0.450	3.903**	0.449
Education	4.008**	0.693	2.935*	0.722	3.060*	0.716
Growth strategy (1)			4.748**	0.432	4.989**	0.419
Growth strategy (4)			3.502*	2.549	3.345*	2.501
Competitiveness strategy (1)			2.197	0.475	2.399	0.456
Performance					0.511	1.109
R2	0,069-0.096		0.133-0.187		0.135-0.189	
Chi-square Model	21.074**		21,292**		,513	
Chi-square Block	21.074**		42,366**		42,879**	

The part of the table 1 labelled *Model 1* shows the parameters of the model when the business size, business age, industry and owner's education are used as predictors. The significance values of the Wald statistics for each predictor indicate that all four parameters significantly predict family/nonfamily membership ($p^{**} < 0.05$; $p^* < 0.1$). The value of the odds ratio (Exp(B)) for **business size** indicates that if the logarithm of business size goes up by one, then the odds of being a family business decrease (because the odds ratio is smaller than 1). In other words family business are smaller in comparison to non-family business, measured by the number of employees. Because both values are smaller than 1 we can also be confident that the relationship between **business size and the dependent variable** found in this sample is true of the whole population of businesses. The odds ratio for **business age** indicates that if the logarithm of business age increases by one, then the odds of being a family business also increase (because it is more than 1). In other words family business have a greater span of existence in comparison to non-family business. The confidence interval for this value ranges from 1.234 to 2.415, so we can be very confident that the value of the odds ratio in the population lies somewhere between these two values. In addition, because both values are higher than 1 we can be confident that the relationship found in this sample is true for the whole population. Family businesses from the sector of services have 53.4% lower odds for being a family business than businesses from the sector of production, respectively family businesses are more concentrated in the sector of production. The odds ratio for **owner's education** indicates that if the level of education of owner of business increases by one, then the odds of being a family business decreases (because it is less than 1). In this respect the owners of family businesses have a lower level of education, in comparison to owners of non-family business. The value of R² indicates that the four variables explain from 6.9% up to 9.6% of the variance of the dependent variable, depending on whether values of Nagelkerke R Square or Cox & Snell R Square are used. The values of Chi-square are assessing the adequacy of the model as a whole and for each block of the hierarchal regression, so they are statistically significant ($p < 0.05$), i.e. the model and the block are predicting the real-world data well.

The output for block 2 shows what happens to the model when new predictors are added (**Growth strategies and Competitiveness strategies**). So, we begin with the model that we had in block 1 and we add **two parameters** more on the existing. Including **Growth strategies and Competitiveness strategies** in the model has significantly improved our ability to predict whether a business will be family or nonfamily. The values of R^2 indicates that **Growth strategies and Competitiveness strategies** determine additional 6.4%, so that together with the three previous parameters a total of 13.3%, or additional 9.1%, i.e. total of 18.7% of the variance of the dependent variable, depending on whether values of Nagelkerke R Square or Cox & Snell R Square are used. The values of Chi-square are assessing the adequacy of the model as a whole and for each block of the hierarchal regression, so they are statistically significant ($p < 0.05$), i.e. the model and the block are predicting the real-world data well. The table labelled *Variables in the Equation* now contains all five predictors. The competitiveness strategies appears not to make a significant contribution to the prediction of dependent variable. On the other side, two of the total six strategies for growth are appearing as specific for family or non-family business. Businesses which use market development strategies have 43.2% lower odds for being a family business, whereas business which use the strategy of modernization, have 2.5 times greater odds for being a family business, in this context family business typically use the strategy of modernization, whereas considerably lower is the usage of the market development strategy (Bearing in mind that this parameter is presented as a categorical variable, the logistic regression generates, 6 dummy variables, where as a reference category the values of penetration market strategy are used, which means that the extent to which certain strategies are implemented are measured in relation to this strategy). Something unusual is noticed in this block: **the business size** no longer significantly predicts family/nonfamily membership. How can it be that business size no longer predicts penalty success, nor one of the two new variables in this block(competitiveness strategy), but still the ability of the model to predict the dependent variable has improved slightly? This often could be explained with the effect of multicollinearity among the independent variables, still mullticollinearity was tested as one of the assumption in logistic regression, and in this line didn't indicate significant collinearity, therefore business size remains a vital part of the model as an important predictor of the dependent variable.

In the third block added is the last variable related to business performance. The values of Chi-square for this block of the hierarchal regression, shows that this block is not adequate , so it does not provide sufficient information to explain the influence of business performance in the variance of the dependent variable. However considering that the model as a whole still indicates statistical significance, the model proves the influence of the remaining variables, tested and explained in the preceding two blocks. Business size which again rises as an important predictor of the model is an interesting fact.

5. CONCLUSIONS

Family business have been raising their importance worldwide in every country, therefore the discussion related to this topic in developing countries cannot and should not surrounded. Although research and data is limited there are still many indications of the increasing number of companies which could be considered as family businesses in developing countries. The growing interest towards family business in all developing countries raise the need for scientifically supported knowledge. Determining the main aspects and characteristics of the family business within developing counties is one of the main assets of this paper.

The results provided by sample gathered indicate that family business are smaller in comparison to non-family business, measured by the number of employees. This is in accordance with the direction of some discussions and conclusions in the relevant literature. Referring to agency managers' which act in self-interest, seeking personal achievement at the expense of firm profits, it could be stated that professionally managed or nonfamily businesses would be larger than the family-owned and managed firm. Family business have a greater span of existence in comparison to non-family business. Given the trans-generational nature of many family businesses, one would expect family businesses to be older. Literature suggests that most of the research includes companies from different industries and very often the results of family and non-family business are differing. According to this research, family businesses are more concentrated in the sector of production. The owners of family businesses have a lower level of education, in comparison to owners of non-family business. Competitive strategies do not provide significant contribution to the prediction of dependent variable. On the other side, two of the total six growth strategies differentiate among family or non-family business. Businesses which use market development strategies have 43.2% lower odds for being a family business, whereas businesses applying the strategy of modernization, have 2.5 times greater odds of being a family business, in this context family business typically use the strategy of modernization, whereas considerably lower is the usage of market development strategy. The results provided in the analysis indicate that there certainly are differences among family and non-family business, so it can clearly be pointed out that the profile of family differs from the profile of non-family business in developing countries. This discussion and analysis opens the door for further research raising more questions related to the family business which still remain unanswered, such as different aspects related to the performance of family vs. non-family business within developing countries, especially those which have experience major transitions in their economic system.

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THE LEARNING REGIONS – REGIONAL ECONOMIC TRANSFORMATION

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ABSTRACT

Globalisation and liberalisation continually impose the *climate of anxiety* on national economies, through a kind of *service to innovativeness*. This innovativeness should not only be seen through a technological dimension, but it also relates to the total innovative approach in the new economy. However, *this time* the solution should be sought in the *reawakening* of regional policy and its instruments. Supporting institutions (Triple Helix) are of strategic interest in promoting the smart specialization policy. Development requires education, a whole set of technical skills, institutions, networks and capacities which enable effective usage of the existing knowledge and need to be a part of new knowledge creation.

For regions which are lagging behind in development, acquisition of the existing knowledge could be more useful than similar investments into R&D. Spillover could manifest itself in several dimensions: university spillover, Triple Helix, FDI and alike. This paper attempts to answer whether internal reorganisation of key regional actors' roles in five counties of Slavonia in forming a new cooperation level (Triple Helix) is possible in order to create innovative surroundings where the existing regions could turn into learning regions.

JEL classification: O18, O31, O43, P25, R10

1. INTRODUCTION

The creation of learning regions has become a necessity in today's globalization era, as supported by the continuity as well as a growing body of research in the field (Florida, 1995; Morgan, 1997; Landabaso, Oughton & Morgan, 1999; Gustavsen, Ennals & Nyhan, 2007; Hull, 2012). Learning regions are an exceptionally good framework for cooperation (Thinesse-Demel, 2010), and innovation has become a distinctive mechanism in defining them (Morgan, 1997; Cook, 2001; Nyhan, 2007; Asheim, 2007). Fritsch (2004, in: Leydesdorff and Fritsch, 2007) points out that the synergy between the industrial structure, geographical distributions, and academic traditions can be considered crucial for the strength of an innovation system. The Triple Helix of university, industry, and government is exemplified in new organizational mechanisms that promote innovation and new business formation (Etzkowitz at al., 2000; Lissenburg & Harding, 2000; Campbell, 2005; Langvik at al., 2005; Cooke & Leydesdorff, 2006; Leydesdorff & Fritsch, 2007; Asheim, 2011; Cooke, 2014). Asheim & Coenan (2004) and Leydesdorff (2006) point out that this form of cooperation results in the balance of knowledge, social benefits and profit motivation. Wang and Zhao (2008) point out the positive spillover effects within an individual industry and between industries and emphasize that vertical spillovers are more significant than horizontal spillovers. Relying on the example of China, Nigerian food companies, and rural India, Jianhong and Hong (2008), Abereijo, Ilori & Olomola (2012), Gille (2012) respectively confirm that FDIs have a significant spillover effect on the regional economy, while Yegorov & Ranga (2014) use the example of Ukraine to prove the importance of spillover resulting from engaging in cooperation with more developed regions (EU). In addition, analyzing the case of Romania, Ranga & Etzkowitz (2012) point out that innovation-based solutions are key in responding to the economic crisis.

The purpose of the research is to highlight the importance of the Triple Helix model of cooperation that supports innovative activity in the region by acquisition of existing knowledge through spillover effect, which, in international terms, proved to be a relevant instrument. The research aims to promote a systematic and thorough creation of positive opinion of the importance of innovation and entrepreneurial thinking of regional actors in order to achieve positive economic growth and development as the ultimate goal. The aim of the research is to contribute to economic theory and practice by making recommendations, which, if followed, would support the transformation of the relations between key regional actors. The theory and practice of this phenomenon has not yet been sufficiently explored in Croatian academic circles. Contemporary phenomena related to regional policy, Triple Helix and the concept of learning regions will be investigated in the framework of economic sciences.

2. HOW DO REGIONS “LEARN“?

What are the key factors that drive high growth of certain regions while other regions remain poor? These regional differences arouse interest in the study of economic growth and regional development. During the last few decades, growth models have emphasized the importance of knowledge and research spillovers in increasing innovative activity and productivity (Riviera-Batiz & Romer, 1991; Grossman & Helpman, 1994). Stough & Nijkamp (2009) define knowledge spillover as diffusion or sharing of knowledge from where it is created or from one to another agent in society. The crucial role in this process is played by universities as they are promoters of research and knowledge that stems from them. The presence of public institutions can have a large impact on regional innovation due to knowledge spillovers

resulting from their research (Ponds, Oort & Franken, 2009). The creation of learning regions has become a necessity in today's globalization era, as supported by the continuity as well as a growing body of research in the field (Florida, 1995; Morgan, 1997; Landabaso, Oughton & Morgan, 1999; Gustavsen, Ennals & Nyhan, 2007; Hull, 2012). Learning regions are an exceptionally good framework for cooperation and a basis for the development of European education policies (see: Thinesse-Demel, 2010), while innovation has become a distinctive mechanism in defining them (Morgan, 1997; Cook, 2001; Nyhan, 2007; Asheim, 2007). Kozma (2012; according to Florida (1995:527) defines learning regions as "collectors and repositories of knowledge and ideas" which "provide the underlying environment or infrastructure which facilitates the flow of knowledge, ideas and learning." Networking and the development of regional innovation system are considered equally important (Langvik et al., 2005; Asheim, 2011; Cooke, 2014), while some authors (Deitmer, 2007) emphasize the principle of effectiveness in the application of regional innovation network. Hassink & Klaerding (2012:24) point out that there are several different ways, macro views and positions when it comes to interpreting learning, which include companies and regional innovation policies. The same authors have highlighted a number of fundamental weaknesses of the concept of learning regions, or more specifically, five fundamental weaknesses: 1) not regions but actors learn, 2) the normative character of the concept, 3) the overlap with other concepts of regional innovation strategies, 4) its fuzziness, 5) and its too strong focus on the local fix. As a possible solution to some of these problems Hassink & Klaerding (2012) propose a shift from a learning region to a learning cluster.

Today more than ever, universities should be the catalysts of change and promoters of knowledge, innovation and entrepreneurship. Their role should not simply be focused on producing new knowledge but also disseminating it to industry and society (Guerrero & Urbano, 2012). Universities play a key role in providing spillovers by academic research and human capital in the form of well trained and educated students (Audretsch & Lehmann, 2005). Casper (2013) emphasizes the importance of university researchers in knowledge spillover from university, but also the importance of university environment for developing knowledge flows. In line with this, various empirical studies have found evidence of localized academic knowledge spillover in the USA (Anselin, Varga & Acs, 1997; Adams, 2002) and in European countries as well (Andersson, Quigley & Wilhelmson, 2004; Fritsch & Slavtchev, 2007; Rodríguez-Pose & Crescenzi, 2012). Another positive thing that can be linked to university knowledge spillovers is the level of entrepreneurial activity. Audretsch and Lehmann (2005) found that those universities in regions with higher knowledge capacity and greater knowledge output also generated a higher number of technology start-ups. Chyi et al. (2012) show evidence of positive knowledge spillover, both domestic and international, on the example of Hsinchu high-tech cluster firms formed near two main research universities in Taiwan. Universities are an extremely important source of spillover for companies at a local and regional level, as well as important channels for technology transfer (Shane & Stuart, 2002 in: Giarratana & Torrisi, 2006).

There are numerous examples of universities encouraging the development of new spin-off companies. The government can also promote cooperation between universities and spin-off companies (Chalmers, Gothenburg; Linköping, Sweden; University of Twente, The Netherlands). Science-based and technology-based spin-offs are characterized by: 1) existence of a parent institution (research institute / university or company where at least one firm founder has been employed as a scientist, administrative or technical staff or student); 2) the new start-up relies substantially on technical knowledge or know-how (not necessarily in the form of licensing or patenting); 3) the parent organization has made an equity investment

in the firm or has directly established the new firm (Giarratana & Torrisci, 2006). There are *corporate spin-offs* and *university spin-offs*, and to produce successful innovative projects, technical managerial and financial capabilities are required (Auerswald & Branscomb, 2003; Blanchflower & Oswald, 1998 in: Giarratana & Torrisci, 2006). Abereijo, Ilori and Olomola (2012), using the example of Nigerian food companies, show that FDIs have a positive spillover effect in terms of knowledge and production technology. Gille (2012) presents a positive FDI effect on economic growth on the example of rural India. Jianhong and Hong (2008) examined if the knowledge spillover effect of FDI inflow exists in China and their results showed that FDIs played a positive role in knowledge creation.

The most commonly accepted interpretation of the learning region is that it is a regional development concept. There is a very strong connection between the main actors (politicians, policy-makers, chambers of commerce, trade unions, higher education institutes, public research establishments and companies) but they are also flexible with regard to interregional and intraregional connections in the learning process (Hassink, 2004). According to the OECD (2001), the same author emphasizes the importance of regional policies in encouraging individual and organizational learning, so that future policy-makers can rise above the interests of individual agencies and companies. Since a learning region is a model, it is not possible to identify examples of actually existing learning regions. In addition, there are various ways of creating a learning region. With the emergence of university's "third mission" beside teaching and research, emphasis is also placed on socio-economic development, research and technology commercialization (Ranga 2014). Being an entrepreneurial higher education institution depends, to a large extent, upon individuals and innovative ways of doing things and therefore recognizing and building – in innovative ways – on what already exists (Gibb et al. 2014). Learning regions are the result of the introduction of flexibility in the existing education institutions by creating new education methods and modern, innovative structures that make education accessible to everyone. Landabaso, Oughton and Morgan (1999) note that the learning ability of a region is affected by the innovation capacity of regional companies. Thus, innovation capacity and the ability of regional learning are dependent on the quality and the level of networking in the regional production environment. Key sources of regional innovation are based on connecting the companies, improving public-private cooperation and the institutional framework. Innovation is the end product, while regional learning is a process, dependent on the quality and level of networking of companies, public-private cooperation and the institutional framework, all of which are discussed below.

3. OPPOSITES ATTRACT: TRIPLE HELIX AND REGIONAL TRANSFORMATION

It is commonly considered in the economic literature that high-tech sector contributes significantly to regional competitiveness. In general, the sector is considered to be the key driver of economic growth and productivity, and it is associated with high levels of innovation. In this way, regions that have a higher proportion of high-tech activities typically achieve greater market share, expand their market reach by developing new products and use the existing scarce resources more effectively (Meri, 2007). Innovation is not a linear, but rather an evolutionary, cumulative and feedback process which can only be realized through cooperation and through economic and social interactions of different actors, and as a result produces technological, organizational and social innovations (Koschatzky, 2005 in: Säll, 2008) (see Table 1). Innovation in *a system of innovations* can itself thus be made the subject of a process of *dissensus* and *consensus* formation. Knowledge production can be considered as a necessary, but not a sufficient step to innovation. It creates a potential which can be

actualized by bringing together users, producers, entrepreneurs, and policy-makers in a "transaction space" where problems and possibilities can be argued. Triple Helix model is based on the integration of the private, public and university sectors in order to accelerate the competitive advantage of the economy. According to Etzkowitz (2003) the Triple Helix model is a process in which university-industry-government spheres overlap with the aim of increasing benefits, larger than the national, regional and multinational systems. This is a new model of fostering cooperation between industry, universities and government agencies with an emphasis on commercialization (Asheim & Coenen, 2004; Leydesdorff, 2006; Leydesdorff & Etzkowitz, 2000; Shapira, 2002; Chanthes, 2012). This is the very model of cooperation which creates balance between knowledge, social benefit and profit-driven motivation (Asheim & Coenan, 2004; Leydesdorff, 2006). The Triple Helix model requires internal entrepreneurial reorganization of each of the key factors (academia, industry and government) as well as the mutual influence of each of the key factors on the creation of new levels of trilateral networks for the creation of new ideas and forms of high-tech and high-touch development. Through interaction and collaboration between the public sector and the education sector an efficient system of knowledge transfer can be built, whereas interaction between the education sector and the private sector results in knowledge-based entrepreneurship. The Triple Helix thesis is based on the fact that the network relations between universities, industry and government are key to the development of knowledge-based economy in a wide range of societies - from post laissez faire capitalism to post-socialist societies. Specifically, the model of controlled relations between universities and industry was launched in the former Soviet Union. Some European countries and many countries of Latin America also had certain parts of this model. The government was supposed to control and guide the industry and the university towards the common goal of development. For example, in Argentina the concept known as the Sabato's Triangle was introduced on the grounds that the government needs to coordinate universities and industry in order to develop new technologies and new industrial companies.

Table 1. Knowledge-based development in three phases

Development phases	Main characteristics
Creation of a knowledge space	Focus on collaboration among different actors to improve local conditions for innovation by concentrating related R&D activities and other relevant operations
Creation of a consensus space	Ideas and strategies are generated in a "Triple Helix" of multiple reciprocal relationships among institutional sectors (academic, industry and government).
Creation of an innovation space	Attempts at realizing the goals formulated in the previous phase; attracting public and/or private venture capital

Source: Etzkowitz, 2005 in: Säll, 2008

The globalization of the configuration of university-industry-government relations can be considered as a result of (Leydesdorff and Etzkowitz, 2001):

- 1) The interconnection between the laboratory of knowledge-production and users of research at various levels—exemplified by the rapid growth of centres in which firms and academic researchers cooperate and jointly set priorities; technology transfer agencies within both universities and firms that negotiate with each other and move technologies in both directions;
- 2) The emergence, spread, and convergence of technological and communications paradigms (the computer, mobile telephony, and the Internet); interaction itself among organizations has become multi-layered, and therefore much more important than those within the walls of one's own institution based on routines and tacit knowledge;

- 3) The consequent transition from vertical to lateral and multi-media modes of coordination, represented by the emergence of networks, on the one hand, and the pressure to shrink bureaucratic layers, on the other.

In its efforts to attract FDIs and ensure long-term growth of the GDP per capita, the government has been re-examining its role (or at least it should) and has started to encourage innovation and new organizational forms (business parks, clusters, etc.), while scientific research and education sector have started to assume the characteristics of private organizations fighting for their position in the market. As noted by Klofsten et al. (1999 in: Leydesdorff & Etzkowitz, 2001), only a small fraction of university innovations is actually utilized by industry, and firms are often created with government assistance, through incubator facilities and entrepreneurship centres. Only one thing is certain and that is that nothing is certain any more. Globalization and liberalization have created a “climate of anxiety” in national economies, where one simply seeks to survive, “swim with the flow” or simply “surrender” to the uncertainty. The economic growth of a nation, as a result of technological advances, does not depend on the abundance of research and development resources, but on the way in which these resources are organized and managed, both at company level and at national level. Leydesdorff and Meyer (2003) highlight three models for the exploration of the knowledge economy based on the innovation system: 1) model based on knowledge production (Gibbons et al., 1994; Nowotny et al., 2001); 2) the model of national innovation system in evolutionary economics (Freeman, 1988; Lundvall, 1988, 1992; Nelson, 1993); and 3) the Triple Helix model of university-industry-government relations (Etzkowitz & Leydesdorff, 2000). Under certain conditions, universities assume the role of industry by helping start new businesses in incubators. The government can take on the role of industry in helping new businesses develop by finding programs and changing the legislation and investment climate. Industry can take on the role of universities in developing human resources through training and research, often at the level of the universities. Through network relations within the Triple Helix relatively autonomous institutions change their structure through interdependent spheres.

The redefining of public/private divide in the knowledge-based economy is inevitable because academic knowledge is a public good, and entrepreneurship requires access to private property. The government’s role in improving the role of universities in the Triple Helix is important, but not dominant. Possible difficulties in cooperation in the innovation system advocated by the Triple Helix include difficulties with coordination of jurisdiction, progress reports, conflicts of interest and potential conflicts over funding. In his exploration of the Swedish Region Värmland, Säll (2008) notes that the interaction between the Triple Helix actors could present a problem due to the government's multi-level perspective. It has been shown, he points out, that horizontally and vertically fragmented institutional framework hampers cooperation between different institutions and actors. Triple Helix concept is powerful, but difficult to implement because it is fuzzy. Achieving cooperation is often easier said than done. Local authorities deal with local issues and are often in conflict with or subordinated to national authorities, who are focused on national priorities. National economic objectives are sometimes in conflict with the local ones. In spite of that, there is no better alternative to the Triple Helix model in terms of the key factors of regional competitiveness.

In considering the role of institutions in the Triple Helix model, it is especially important to mention the fact that it does advocate that institutions abandon their original roles and identities. The aim is to encourage their cooperation which should reinforce other institutional

roles they perform. Although a university may establish an incubator on the basis of its endogenous capacities, incubation is most productively organized as a cooperative venture between one or more universities, a local government authority, and a consortium of financial institutions interested in enhancing the local innovation environment. The growing role of the university in the new economy is a result of providing industry and the government with trained personnel which, by engaging in research can ensure the development of industry. An interesting application of the Triple Helix is definitely the "story" of smart specialization. According to the OECD report (OECD, 2015), smart specialisation's approach combines industrial, educational and innovation policies to suggest that countries or regions identify and select a limited number of priority areas for knowledge-based investments, focusing on their strengths and comparative advantages. European Commission (2015) defines smart specialization as a new innovation policy concept designed to promote the efficient and effective use of public investment in research. Its goal is to boost regional innovation in order to achieve economic growth and prosperity, by enabling regions to focus on their strengths. Smart specialisation is not a planning doctrine that requires a region to specialise in a particular set of industries. Instead, it aims at exploring and discovering new technological and market opportunities and at opening thereby new domains for constructing regional competitive advantages. Specifically, the crucial question is whether that region would benefit from and specialize in certain research and development and innovation projects in some lead activities. According to Foray (2009), the basic characteristics of smart specialization are the following: the creation of large research and innovation areas, allowing unrestricted competition as an essential condition for specialization; an entrepreneurial process in which the new knowledge produced relates to the pertinent specializations of the region; the specific properties of General Purpose Technologies (GPT) to clarify the logics of smart specialization for both regions that are at the technological frontier and those that are less advanced.

3.1. Triple Helix "in the field" – what is the actual level of cooperation?

Although there are studies in the field of regional policy of the Republic of Croatia, this area is still relatively new if one considers recent international research on the Triple Helix, spillover effect and the concept of learning regions. Consequently, the research was difficult due to methodological issues. In-depth interviews were used to interview respondents from the five counties of Slavonia and Baranya, categorized using the Triple Helix model, so as to gather the opinions of individuals who are daily faced with the issues of regional development. Branković (2007) points out that qualitative research seeks to provide a layered and nuanced description of immediate reality, which often resists generalisation ... all of these reasons are enough, he continues, to reject prejudices about qualitative methodology 'not being scientific' and to do away with the opinion that qualitative and quantitative approaches are mutually exclusive. As already mentioned, conducting research in this area is difficult due to methodological issues as it is a relatively new field in scientific circles. Quantitative research methods cannot provide answers to many questions in this type of research. It is difficult to measure the intensity as well as a unique pattern of phenomena in this area. As Branković (2007), Hamersveld and Bont (2007) and Boyce and Neale (2006) notes, the purpose of qualitative research methods is to objectively describe and explain social phenomena, preferably identify the cause-effect relationships and prove them. It is more interested in phenomena that remain far beyond the reach of categorisation and research tools. Therefore, its main goal is not an objective description and explanation of social phenomena, but understanding their purpose and meaning that people attach to them. A qualitative method of in-depth interview was used, which, for the purpose of this research, was semi-structured, because of the respondents' different background, experiences and views on the subject of

research. In view of that, some interviews were open and flexible to allow respondents to talk freely and spontaneously and give their own interpretation of events, cause-and-effect relationships, etc. Bearing in mind the method of research used in this paper, there is no concrete or simple answer as to the adequate size of the sample pool. It is generally assumed that the sample size is adequate when no new information is forthcoming from new interviews. It is typically considered that ten interviews are enough to reach the ‘saturation point’ if the right persons have been interviewed. Following this practice, nine persons were interviewed, which proved enough for making the necessary conclusions. The survey included the following respondents:

- 1) **University** - five representatives of “science” (university/polytechnic/business school) - selection criteria: research in the field of regional policy / research into the role and importance of entrepreneurship and innovation / research into industrial policy but also active personal cooperation with business on the local and national level;
- 2) **Industry** (and so-called “supporting institution”)- two representatives of high-growth industrial enterprise - metal-processing industry and ICT according to NACE 2007 - selection criteria: export performance / realized profit / number of employees and a growing sector (director / manager / owner / board member / legal representative) and one respondent representing the interests of employers (Croatian Employers’ Association, CEA, General Director’s Office, which participates in solving the problems of employers at the local and national level);
- 3) **Regional government** - two representatives of local and regional government (Head of Department of economic affairs / regional development issues and EU funds – research in the field of regional policy, science and practice in planing, promoting and activities).

All respondents were asked the same questions. Below is the summary of conclusions from in-depth interviews grouped according to the respondents’ answers (Table 2).

Table 2. Key problems that inhibit development of the Triple Helix cooperation on the regional level

	University	Industry	Regional government
I. The reasons for regional disparities in the Republic of Croatia, in the five counties of Slavonia and Baranya¹ (from most important to less important factors)			
1	war and the destruction caused by war and inadequately conducted privatization post-war;	irresponsible and inconsistent actions of the legislator but also bad existing development programmes;	politically acceptable individuals lacking competence are put in leadership positions, there is lack of accountability for the wrong actions or inactions; corruption;
2	degradation of expertise and qualifications; politically acceptable individuals lacking competence are put in leadership positions, there is lack of accountability for the wrong actions or inactions;	lack of the system of responsibility in public sector; slow pace in efficient implementation of laws and reforms;	inadequate regional fiscal policy; financial problems for co-financing projects on local/regional level;
3	atmosphere of pessimism, depression and indifference to proactive action;	poor transport links and high transport costs;	frequent lack of understanding of “regional development”; lack of coordination in development programme; lack of strategic thinking;

¹ Virovitica-Podravina County, Osijek-Baranya County, Požega-Slavonia County, Vukovar-Srijem County and Brod-Posavina County

Note I: It is interesting to note that only one respondent from "science" identified over-centralization as an obstacle to regional development.			
II. Barriers for the transformation of the Croatian's relatively technologically outdated and focused on low-technology manufacturing industries with lower added			
1	generation length (education least one generation of new professions and retrainings);	financial and administrative complexity of the restructuring and the inertia that comes from it;	the lack of capital, teaching staff and research activities;
2	positive developments in the EU funds and the availability of knowledge - university spillover;	positive developments in the EU funds and the availability of knowledge - university spillover;	lacking the cooperative environment and entrepreneurial culture; "mess of individual interests" and "vanity";
3	Promotion of good practice and university-industry cooperation;	"sluggishness" in business as a result of negative/slow/ inadequate and ineffective legislation;	-
Note II: Positive developments in the EU funds and the availability of knowledge - university spillover was not mentioned by "regional government"!			
III. Concrete ways to improve the investment climate on regional level			
1	the restructuring does not depend only on financial resources but also on continuous restructuring of the mindset and innovation that must be woven into all aspects of activities;	an efficient and effective justice system, measurable outcomes, elimination of administrative / bureaucratic obstacles;	continuity of tax policy; elimination of administrative / bureaucratic obstacles;
2	"there" must be a vision, passion and desire for positive change by people in leadership positions; this change should not be "cosmetic" or change per se, but meaningful;	avoiding frequent tax but also wider range of legislation changes;	reduce the impact of local politics and local politicians by allowing investors access to higher levels of government;
3	it is not necessary that all parts of the company are high-tech; however, other functions in the company must be highly competent and innovative (manufacturing the old way, but with an innovative approach);	the need to change the mindset of public employees so that the public sector truly "serves" the citizens and the business sector, and to introduce innovative administrative procedures;	local citizens "mindset change" – potential investor is not "bad person" but contributor to the strenght of local economies;
Note III: Reduce the impact of local politics and local politicians by allowing investors access to higher levels of government - interestingly enough, this issue was highlighted by "government";			
IV. The local and regional governments are ready and willing to "learn" from others and generally improve the quality of their cooperation with local economic actors			
1	regional and local government plans are usually shorter than those at the national level – who is responsible for it? (no one);	regional and local governments are generally willing to cooperate, but there is no added value and cooperation; the only exception is cooperation on EU funds	regional and local governments are generally willing to cooperate; the good example is cooperation through EU funds;
2	there is a practice of hiring people who lack competence for positions that require highly competitive individuals, while competent individuals work in less paid jobs resulting in the loss of productivity;	The high economic cost of "bad government"; centralization (capital, human etc. in Capital City Zagreb), but also too many local and regional governments, which opens the possibility of "unnecessary" employment;	-
3	there is a lack of innovation and creativity and a lack of social interest and accountability;	-	-
Note IV: Regional and local government/authorities usually (or too often) do not take responsibility for the results of the local economy (they take a passive role in local or regional economic policy)			

V. The main reasons for long-lasting separation of universities and industry, and recommend ways of intensifying cooperation			
1	the necessity to organize gatherings, joint meetings, and round tables as a platform for mediation between, and channelling of the needs and demand;	the flexibility of the curriculum, encouraging students to do internship, work on real-life projects and start spin offs;	political decisions, instead of making them based on knowledge, and therefore it is not in their interest to engage university capacities for the purpose of development;
2	distrust with regard to the competence, abilities and interest;	‘traditional’ way of thinking and slow change in the way of thinking of some university professors who are not associated with industry and are reluctant to accept change;	lack of strong, innovative industries that need knowledge and innovation;
3	lack of awareness and insufficient promotion of successful joint projects;	-	lack of motivation and demotivating political climate;
<i>Note V: The flexibility of the curriculum (ect.) was not mentioned by “university”; It is crucial to motivate all stakeholders, eliminate the negative perception and mitigate the negative political climate but also to create efficient measuring methods of public sector.</i>			
VI. Distinguished guidelines of the future regional development (and recommendations for the Triple Helix cooperation)			
1	it is necessary to clearly identify persons responsible for communication and monitoring of activities, as well as promote positive experiences as much as possible;	activities that are of common interest must be coordinated, provided that only competent professional staff are engaged;	it is necessary to work together and start putting the public interest before personal and political interests;
2	reform of the state and regional/local administration;	consistence in conduct of strategies regardless of political options;	attraction of productive investments;
3	change in thinking and comprehension of the role of the government in economy;	-	-
<i>Note VI: “University did not mentioned problems with “publishing just to publish” practice; “government” did not mentioned smart specialization policy/clusters or other innovative ways of cooperation; also responsibility for fostering the cooperation on local/regional level; “industry” is still “self-oriented”(which is not surprising); positive changes in short time are “unattainable” (and we are already “behind”)</i>			

Towards the end of the interview, respondents were asked to describe their view of the worst and best-case scenario for the future of their region. Best-case scenarios included the development of a profitable environment in which the fact that a region is lagging behind is turned into an advantage by developing green technology, agro-processing and tourism projects through the Triple Helix cooperation. Worst-case scenarios are mostly associated with the continuation of the current economic and social climate/policy that will further impoverish the development base (demographic and economic).

4. INSTEAD OF A CONCLUSION

Any region can become the “learning region”, depending on the innovative environment. If the regional government “fails”, the university can take on the role of creating investment and innovative environment in the region, which then creates a regional dimension of the development policy. In theoretical concepts such as clusters, innovative milieus and regional innovative systems, regional innovative differences are no longer the result of location parameters, but depend on the ability of key stakeholders at the regional level to establish intra- and interregional information and production networks, participate in network

integration and make profit from those networks by means of collective learning processes. There are cases where companies from manufacturing industries are looking for opinions and scientific studies from faculties, but there is no cooperation between faculties and the university, in particular no cooperation that could result in new interdisciplinary scientific fields or knowledge that could enhance economic development. Out of all existing "certain strategies", there is not a single one which would comprise key goals and determine "a certain" course of development. Currently the productivity of scientific work at university is measured in the number of published articles in well-known journals, not taking into consideration the real value, impact and their contribution to socio-economic development. Putting the number of published articles as one of the key requirements for being promoted to a higher academic rank is encouraging "publishing just to publish" without encouraging publishing of research-based scholarly work that could contribute to social and economic development. Technological excellence does not necessarily lead towards regional economic benefit. Not many industrial companies have managed to survive those unfortunate times and those that did, invest little in research and development in their own departments. Without engaging in joint research projects it is not possible to create a stimulating environment for technological transfer, research commercialization, and for spin-off formations. Creating stimulating environment for research, technology transfer and start-up firms represents a challenge, especially when there is a lack of financial resources.

The empirical research indicates that all three actors in the Triple Helix are aware of the existing aggravating circumstances that limit regional growth and development. Although the answers differ in some aspects, it was particularly interesting to learn that all respondents agreed about sensitive issues and even about their authority. In spite of being based on an extremely small sample size, the results may indicate a mild positive trend of growing awareness, which, if continued, could result in positive changes at the regional level. The results of theoretical and empirical research can, to a large extent, promote and advance the theory both in scientific circles and beyond. Moreover, the research can be used as a source of information and ideas by large professional organizations, expert teams, and associations in the institutional setting, directing their activities towards increasing the efficiency, competitiveness and productivity aimed at overall economic growth and prosperity in the region in which they operate. The insights gained through this research can be used in transferring knowledge to students, as an impetus for future research, or as a motivation to consider the importance of innovative and entrepreneurial way of thinking and acting, and taking responsibility. Recommendations for higher education institutions focus on changing the landscape of teaching and learning in higher education through engaging faculty members in new innovative practice, stimulating those who engage in such a practice and review existing organizational boundaries and linkages. Recommendations for policy makers address the need for clear regulatory frame for online learning, quality assurance, clarifying the funding implications, intended outcomes and timescale for the innovation.

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MODEL-BASED SUPPORT TO EU POLICYMAKING: EXPERIENCE OF THE RHOMOLO MODEL ¹

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ABSTRACT

RHOMOLO is the dynamic spatial general equilibrium model of the European Commission. It is developed by Directorate-General Joint Research Centre (DG JRC) and used in cooperation with Directorate-General for Regional and Urban Policy (DG REGIO) for policy impact assessment and provides sector-, region- and time-specific model-based support to EU policy makers on structural reforms, growth and cohesion policies. The current version of RHOMOLO covers 267 NUTS2 regions of the EU27 Member States and each regional economy is disaggregated into NACE Rev. 1.1 industries. Goods and services are consumed by households, government and firms, and are produced in markets that can be perfectly or imperfectly competitive. Spatial interactions between regions are captured through trade of goods and services (which is subject to trade costs), factor mobility and knowledge spillovers. This makes RHOMOLO particularly well suited for analysing policies related to transport infrastructure, human capital, R&D and innovation.

¹ The author is solely responsible for the content of the paper. The views expressed are purely those of the author and may not in any circumstances be regarded as stating an official position of the European Commission.

1. INTRODUCTION

The geographical distribution of the gains from economic integration has been a concern of decision makers since the early beginnings of the European Union (EU). The Cohesion Policy is the EU's instrument for reducing regional disparities and stimulating the economic development of regions that are lagging behind (Cohesion Report, 2014). EU support to regions is provided as a financial contribution to programmes negotiated with the Member States. The Structural and Cohesion Funds amount to roughly one third of the EU budget, which means that between 0.3% and 0.4% of the EU's GDP is redistributed over Member States and regions through the EU Cohesion Policy. At the receiving end - for the less developed regions - the inflow of funds can be a very substantial part of regional income even though there is a maximum of about 4% of GDP to the funding received by any Member State in a given year.

The EU Cohesion Policy supports a wide range of activities, ranging from the building of motorways to training programmes, such as for instance helping new magistrates to improve their knowledge of EU law. The multitude and diversity of the projects and inter-dependencies between regions make it difficult to evaluate the effects of the Cohesion Policy at any aggregate level. Nevertheless, this is what EU policymakers are required to do in order to be able to compare the returns on different types of investment, taking into account the externalities which would justify making the public investment at the EU level. How the funding assists the regions in increasing their capacity for growth and to what extent the impact spreads across regions are major issues of Cohesion Policy evaluation, for which a general equilibrium modelling approach with a spatial dimension is required.

In this study we present a dynamic spatial general equilibrium approach to policy impact assessment. In order to demonstrate the strengths of the approach, the paper takes the example of one broad category of investment -- infrastructure (INF) -- and looks at possible impacts on EU regions. In doing so, it addresses a point made in the 6th cohesion report that, even though the infrastructure connecting the EU15 - the Member States forming the EU before the enlargement in 2004 - had largely been completed, there is still a great need to improve transport links to the EU13 - the thirteen Member States which joined in the last rounds of EU enlargement.

The objective of this simulation exercise is to demonstrate how the adopted dynamic spatial general equilibrium approach can improve the understanding of the impact of EU transport infrastructure policies on short-, medium- and long-term development in the regional economies. Due to the complexity of regional economies, non-linearities in the policy impacts, and the induced network effects, the total short-, medium-, and long-run effects of transport policies are difficult to determine a priori. Therefore policy makers have to rely on modelling tools that are able to predict how the direct and indirect effects of specific policies might affect regional economies over time.

Usually, transport investment proposals are subject to cost benefit analyses at the national and EU level to determine whether the present value of total net benefits including environmental impacts exceeds the cost. However, several important policy issues remain unresolved in standard evaluation procedures. One question is whether the so-called direct measurement of user benefit, which consists in quantifying changes in surplus of the users of the transport system, captures all welfare effects in the economy? A related question is how the gains (or possibly losses) of transport policies are distributed between regions, sectors, and individuals?

Running simulations with the 2014-2020 Cohesion Policy expenditure data for infrastructure investments until 2025, we show how the approach taken in RHOMOLO can help to identify both the direct and indirect effects of policy interventions at the regional level and the shift of the pattern of the impact between regions and sectors over time. In order to assess the possible impact of investments in infrastructure over time, the RHOMOLO model is used in combination with the Commission's QUEST model. The sophisticated dynamics and inter-temporal optimisation in a multi-country setting of QUEST allows for inter-temporal calibration of RHOMOLO with respect to the macro-dynamics of QUEST.

2. OVERVIEW OF THE RHOMOLO MODEL

RHOMOLO is the dynamic spatial general equilibrium model of the European Commission. It is developed and used by Directorate-General Joint Research Centre (DG JRC) in cooperation with Directorate-General for Regional and Urban Policy (DG REGIO) for policy impact assessment and provides sector-, region- and time-specific model-based support to EU policy makers on structural reforms, growth and cohesion policies. The current version of RHOMOLO covers 267 NUTS2 regions of the EU27 Member States and each regional economy is disaggregated into NACE Rev. 1.1 industries. Goods and services are consumed by households, government and firms, and are produced in markets that can be perfectly or imperfectly competitive. Spatial interactions between regions are captured through trade of goods and services (which is subject to trade costs), factor mobility and knowledge spillovers. This makes RHOMOLO particularly well suited for analysing policies related to human capital, transport infrastructure, R&D and innovation. RHOMOLO is built following the same micro-founded general equilibrium approach as the QUEST model of Directorate-General for Economic and Financial Affairs (DG ECFIN), and is often used in combination with it.

In the tradition of Computable General Equilibrium (CGE) models, RHOMOLO relies on an equilibrium framework a la Arrow-Debreu where supply and demand are influenced by a system of prices subject to macroeconomic constraints. Policies are introduced as shocks to the existing equilibrium driving the system towards a new equilibrium by clearing all the markets after the shocks. Therefore, CGE models have the advantage of providing a rigorous view of the interactions between all the markets in the economy. Given the regional focus of RHOMOLO, in addition to input-output links between economic sectors, a particular attention in RHOMOLO is devoted to the explicit modelling of spatial linkages, interactions and spillovers between regional units of analysis. For this reason, models such as RHOMOLO are referred to as Spatial Computable General Equilibrium (SCGE) models. In addition, a richer market structure has been adopted to describe pricing behaviour in imperfectly competitive sectors, as RHOMOLO deviates from the standard large-group monopolistic competition a la Chamberlin (1890).

Each region is inhabited by households, whose preferences are captured by a representative consumer with a love for variety (Dixit-Stiglitz 1977). Income is derived from labour (in the form of wages), capital (profits and rents) and transfers (from national and regional governments). The income of households is spent on savings, consumption and taxes.

Firms in each region produce goods that are consumed by households, government or firms (in the same sector or in others) as an input in their production process. Transport costs for trade between and within regions are assumed to be of the iceberg type and are sector- and region-pair-specific. This implies a $5 \times 267 \times 267$ asymmetric trade cost matrix, which is derived from the DG JRC transport model TRANSTOOLS (<http://energy.jrc.ec.europa.eu/transtools/>).

2.1. Product markets: segmentation and differentiation

Each region hosts sectors with and without scope for product differentiation between varieties. Hence, the six different sectors of each regional economy are therefore split into two categories: homogeneous-good-producing perfectly competitive sectors and imperfectly competitive sectors supplying the differentiated goods. Firms in perfectly competitive, constant-returns-to-scale sectors produce undifferentiated commodities and price at marginal costs. Firms in the imperfectly competitive differentiated goods sector produce specific varieties under increasing returns to scale. These firms can price-discriminate their export markets and, given the small-group monopolistic competition structure, can set different levels of mark-ups in the different destination markets. The number of firms in each sector-region is empirically estimated through the national Herfindahl indices, assuming that all the firms within one region share the same technology. The main intuition is that firms with higher market shares are able to extract higher mark-ups from consumers than their competitors because of their higher weight in the price index. Since market shares vary by destination market, also mark-ups vary by destination market.

Perfectly competitive sectors are characterised by undifferentiated products produced under constant returns to scale technology. Consumers can distinguish the different origins of the product, so that the standard Armington assumption is respected, but they cannot distinguish individual providers of the good, which means that firms compete under perfect competition and the resulting price equals the marginal costs of production. This means that the production of such goods does not yield any operating profits to the producers, whose number is irrelevant to the model given their constant- returns-to-scale technology.

As for the imperfectly competitive sectors, they are instead populated by a finite (though possibly high) number of firms producing differentiated products, whose specific characteristics are visible to consumers. Consumers, who are able to distinguish both the geographic origin of the product and the characteristics associated with each individual producer, enjoy variety in consumption. Consumers' perception of heterogeneity between variety pairs is captured by the elasticity of substitution parameter, which is the same for all variety-pairs, so that all varieties enter consumer preferences symmetrically.

Regional markets are assumed to be spatially segmented, which implies that firms can optimally choose a different price in every regional market served. Under the standard monopolistic competition assumptions, in models where preferences are described in terms of constant elasticity utility functions à la Dixit-Stiglitz (1977), the elasticity of substitution would suffice in determining the mark-ups and pricing of each firm in every destination market. Firms apply the same Free On Board (FOB) export prices to all destination markets, including a constant mark-up that depends only on the elasticity of substitution, and difference in observed Cost, Insurance and Freight (CIF) import prices depend only on differences in iceberg transport costs, abstracting from taxes and subsidies.

However, one critical assumption of the monopolistic competition framework is that firms in the market are sufficiently small to treat market aggregates as exogenous in their pricing behaviour. Therefore, RHOMOLO adopts a more general description of the market structure and allow firms to behave strategically. Given the potential presence of large firms in small regional markets, the assumption of atomistic firms of negligible size has been relaxed in favour of a more general small- group monopolistic competition framework (Baldwin et al., 2011). Following the literature on non- atomistic firms, in RHOMOLO firms' market power increases with their market share. Besides resulting in a more realistic description of firm

behaviour, one key reason to depart from a large-group monopolistic competition assumption in favour of a small-group monopolistic competition structure is rooted in the regional focus of RHOMOLO, which implies that large firms may compete in small regions, arguably resulting in non-negligible market shares of competitors. This market structure implies that, in determining their equilibrium prices or quantities, firms take into account their impact on the price index, which grows with their market share.

2.2. Labour markets: unemployment and migration

Unemployment in RHOMOLO is modelled through a wage curve. A wage curve implies that wages are set above the market clearing level, resulting in unemployment. As in Blanchflower and Oswald (1995), the wage curve in RHOMOLO is 'empirical law' that negatively relates individual real wages to the local unemployment rate (controlling for a set of interpersonal productivity characteristics, such as education, sex, age, etc.). From a theoretical perspective, the wage curve can be interpreted as a reduced-form representation of various complete structural models of imperfect labour markets, such as union wage bargaining models, efficiency wage models, or matching models. The existence of a wage curve has been documented extensively in the literature (Blanchflower and Oswald, 1995). In the context of RHOMOLO, an important advantage of modelling labour markets via a wage curve is its combination of operational applicability and sound micro-foundations, which make it an ideal choice for a high-dimensionality model with representative agents in each region. In addition, it is the standard approach followed in CGE models to model unemployment (see, for example, Boeters and Savard, 2013).

Additional channels of labour market adjustment, such as labour migration, participation, human capital accumulation, etc. are elaborated in a specific labour market module (see Brandsma et al 2014; and Persyn et al 2014). The labour market module is being activated in those RHOMOLO simulations where significant impact on labour markets can be expected.

2.3. Modelling innovation: R&D and knowledge spillovers

RHOMOLO models R&D as one sector of the economy producing innovation. The three main agents involved in the innovation process are: an R&D sector, high-skill workers and final (intermediate) demand of firms. The national R&D sector sells R&D services to firms in all the sectors of the economy located in the same country and uses a specific high-skill labour factor.

The production (and purchase) of R&D services generates positive spatial knowledge spillovers. In line with Leahy and Neary (2007), any innovative activity has an information component that is almost completely non-appropriable and costless to acquire, an idea dating back to Marshall (1920) and Nelson (1959). The introduction of this idea in general equilibrium models, though, is more recent, splitting research activities into an appropriable and non-appropriable knowledge, as for example in Goulder and Schneider (1999) in the context of climate studies, or Diao et al. (1999) based on a theory of endogenous growth, or based on the extension of product varieties (Romer, 1990; Grossman and Helpman, 1991; Aghion and Howitt, 1992).

In RHOMOLO, there are spatial technology spillovers in the sense that the national R&D sector affects the total factor productivity of the regions within each country, which results in inter-regional knowledge spillovers from the stock of national accumulated knowledge. This

positive externality derived from the accumulation of a knowledge stock in the country can benefit all regions to a different extent through sector-region specific spill-over elasticities.

2.4. New Economic Geography features

The structure of the RHOMOLO model engenders different endogenous agglomeration and dispersion patterns of firms by making the number of firms in each region endogenous (for details see Di Comite and Kancs, 2014). Three effects drive the mechanics of endogenous agglomeration and dispersion of economic agents: the market access effect, the price index effect and the market crowding effect. The market access effect captures the fact that firms in central regions are closer to a large number of consumers (in the sense of lower iceberg transport costs) than firms in peripheral regions. The price index effect captures the impact of having the possibility of sourcing cheaper intermediate inputs because of the proximity of suppliers and the resulting price moderation because of competition. Finally, the market crowding effect captures the idea that, because of higher competition on input and output markets, firms can extract smaller mark-ups from their customers in central regions.

Whereas the first two forces drive the system of regional economies towards agglomeration by increasing the number of firms in core regions and decreasing it in the periphery, the third force causes dispersion by reducing the margins of profitability in the core regions. However, in addition to these effects, which are common to theoretical New Economic Geography models with symmetric varieties, the specific characteristics of spatial CGE models, such as RHOMOLO, implicitly add some stability in location patterns by calibrating consumer preferences over the different varieties in the base year. Through calibration, the regional patterns of intermediate and final consumption observed in a given moment of time are translated into variety-specific preference parameters, which ensure a given level of demand for varieties produced in each region, including peripheral ones. Therefore, it would be impossible to obtain extreme spatial configurations in terms of agglomeration or dispersion because firms in the regions with very low number of firms would enjoy very high operating profits due to the high level of consumer marginal provided by their relative scarce variety and thus would attract more firms in the region.

2.5. Recursive dynamics and equilibria

Due to its high dimensionality, RHOMOLO is solved following a recursively dynamic approach. It contains a sequence of short-run equilibria that are related to each other through the build-up of physical and human capital stocks. The extensive regional disaggregation of RHOMOLO implies that the dynamics have to be kept relatively simple. In contrast to QUEST, which is a fully dynamic model with inter-temporal optimisation of economic agents, RHOMOLO is solved recursively, implying that the optimisation problems in RHOMOLO are inherently static, the different periods being linked to each other through the accumulation of stocks in the economy. In each period the households make decisions about consumption, savings and labour supply in order to maximise their utility subject to budget constraint.

3. SCENARIO CONSTRUCTION: INPUT DATA INTO SIMULATIONS

In the 2014-2020(+3) financial programming period the EU Cohesion Policy will spend around 162 billion EUR on infrastructure (European Commission, 2014). However, there are large inter-regional differences in the Cohesion Policy expenditure on infrastructure ranging from 1.3 million EUR to 5263 million EUR per region. In line with the overall objectives of

the Cohesion Policy, the largest amounts are allocated to *less developed regions*. The Cohesion Policy expenditures on infrastructure are considerably lower in the *more developed regions* and in the transition regions, which are either on their way to pass the 75% of the EU average GDP per capita benchmark or have fallen below that mark for statistical reasons.

In order to simulate the Cohesion Policy infrastructure investments in RHOMOLO, the expenditure in EUR needs to be 'translated' into adjustments in (exogenous) model parameters. In the case of transport infrastructure investments, these are reductions in transport costs (which can be taken together in the calculation of an indicator of regions' accessibility). Figure 1a shows the total impact of the Cohesion Policy investments in transport infrastructure on regions' accessibility, whereas Figure 1b shows the marginal impact per 1 EUR invested.

Figure 1a suggests that the pattern of accessibility improvements is similar to the pattern of the Cohesion Policy expenditures. Figure 1a also reveals that there are significant differences in transport cost reductions between regions. In line with the expenditure pattern of the Cohesion Policy, the largest transport infrastructure improvements will take place in the *less developed regions* (dark shaded regions in Figure 1a).

Figure 1a: Total impact on accessibility

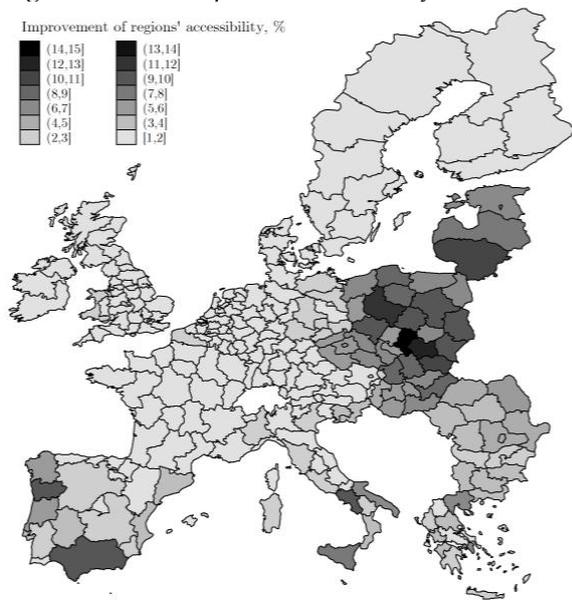


Figure 1b: Marginal impact on accessibility

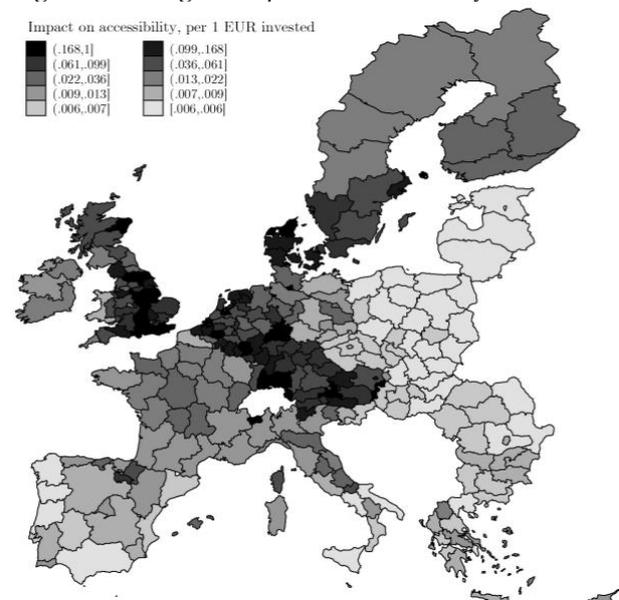


Figure 1b shows that 1 EUR investment in transport infrastructure has a larger marginal impact in the *more developed regions* (dark shaded regions). The reason for differences between the two maps is that transport cost reductions in the *less developed regions* improve accessibility also of the *transition regions* and the *more developed regions*. Even if there would be zero investment in the *more developed regions*, they still would benefit from improved access to markets in the *less developed regions*, making their marginal impact per 1 EUR invested much higher compared to the *less developed regions*.

4. SIMULATION RESULTS²

This section reports simulation results of the RHOMOLO model, which for the purpose of these simulations has been aligned with the QUEST model. Figures 2a and 2b report the total GDP impact and the marginal GDP impact, respectively. Not surprisingly, the results reported in Figure 2a suggest that the impacts of the Cohesion Policy investments in transport infrastructure differ considerably between EU regions. Generally, the pattern of the Cohesion Policy impact on GDP reported in Figure 2a is similar to Figures 1a and 1b, showing that those regions which receive a lot of the Cohesion Policy support for infrastructure improvement are among the largest beneficiaries in terms of GDP growth. Particularly, regions located in the Eastern and Southern parts of the EU benefit from the Cohesion Policy investments.

However, the spread between the top regions and the bottom regions is considerably lower in Figure 2a (ranging from 0% to 3.5%) compared to Figure 1b (ranging from 1% to 15%). Figure 2a shows some spreading of the positive effects to other regions than the ones benefiting most from the Cohesion Policy investments, notably in Romania, Italy and Spain. This can be explained by inter-regional linkages (trade of goods, movement of factors and firms) and spillovers.

Figure 2b reports the marginal impact on real GDP in 2030 per 1 EUR of infrastructure investment. Figure 2b suggests that centrally located (core) regions of the EU gain more from 1 EUR invested in transport infrastructure than peripheral regions. This can be explained, e.g., by inter-regional differences in the marginal impact of infrastructure investment on regions' accessibility (Figure 1b). Larger marginal GDP gains per 1 EUR of infrastructure investment reported in Figure 2b are in line with larger marginal gains in accessibility per 1 EUR of infrastructure investment reported in Figure 1b.

Figure 2d reports the marginal impact on real GDP in 2030 per 1 % accessibility improvement (reduction in trade costs). Whereas the normalisation we use in Figure 2b takes out only the inter regional *differences in investment*, the normalisation we use in Figure 2d goes a step further and takes out also the inter-regional *differences in accessibility improvements*. Hence, it shows solely those inter-regional differences in the impact on GDP, which are produced endogenously within the model. Generally, Figure 2d suggests that the largest marginal benefits are in the *less developed regions*. In the Northern Europe British Isles and Scandinavia would benefit the least in marginal terms. This may be explained, e.g., by their already high level of infrastructure development.

² The simulations presented in this paper were performed with the RHOMOLO model, which was calibrated to 2007 base year data. In the next updates of the base year RHOMOLO will be extended to include also Croatia. See <https://ec.europa.eu/jrc/rhomolo> and <http://rhomolo.jrc.ec.europa.eu> for the latest version of the RHOMOLO model and base year data.

Figure 2a: Total impact on real GDP

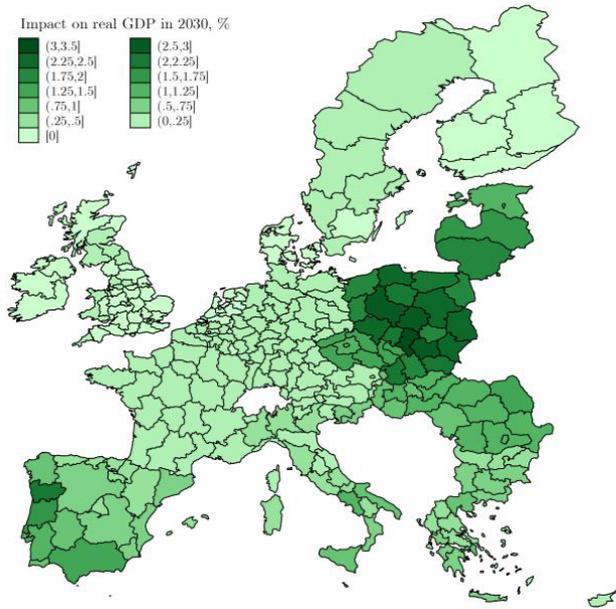


Figure 2b: Marginal impact on real GDP

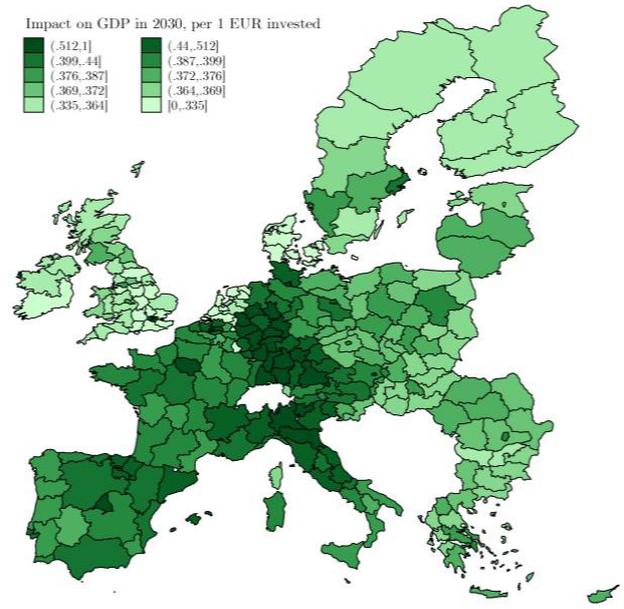
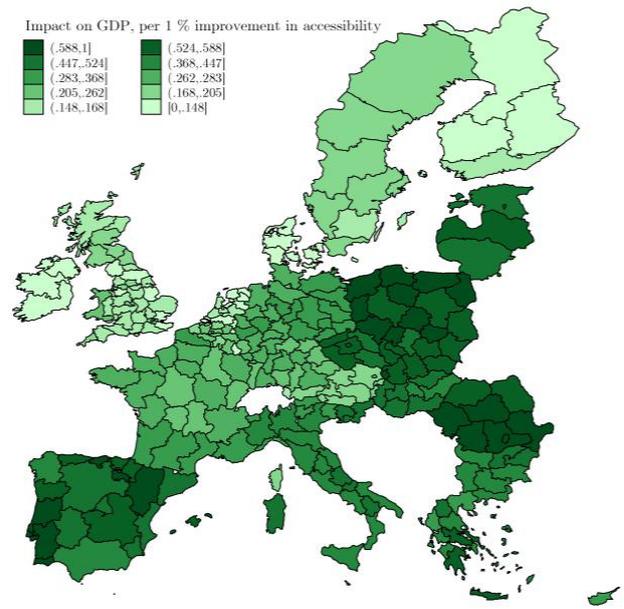
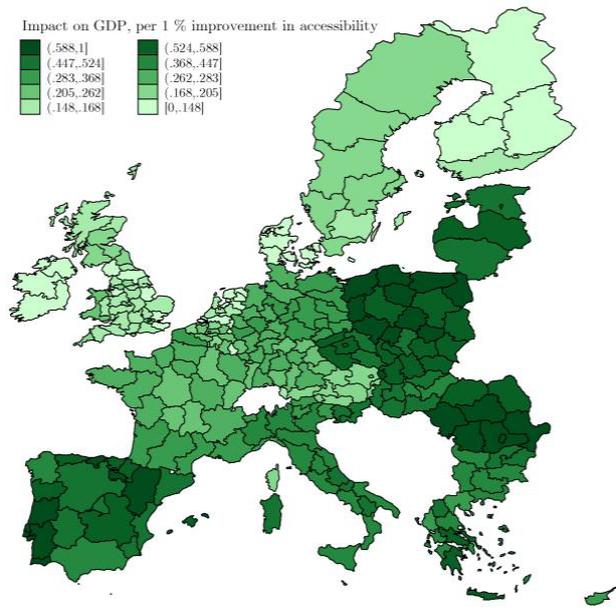


Figure 2d: Marginal impact on real GDP



Figures 3a and 3b compare the input (Cohesion Policy investments in transport infrastructure) with the impact (policy-induced GDP growth) between the *less developed regions* and the *more developed regions*, respectively. In both Figures X axis measures the development level of regions: the *less developed regions* are on the left, the *more developed regions* are on the right. Y axis measures the Cohesion Policy share in GDP: in Figure 3a the share of infrastructure investment in regions' GDP, in Figure 3b the change in real GDP due to the Cohesion Policy investments in transport infrastructure. The size of the squares/circles is proportional to the size of Cohesion Policy investments in million EUR.

Figures 3a and 3b tend to confirm the results reported in Figures 1a - 2b. Figure 3a reports that, on average, the *more developed regions* (red circles in Figure 3a) receive a lower share of the Cohesion Policy investment in infrastructure in terms of GDP than the *less developed regions* (green squares in Figure 3a). On average, green squares are considerably larger than red circles, implying that the *less developed regions* not only invest more in transport infrastructure (in terms of GDP), but invest also higher amounts in EUR compared to the *more developed regions*.

Figure 3a: Marginal input: Share in GDP

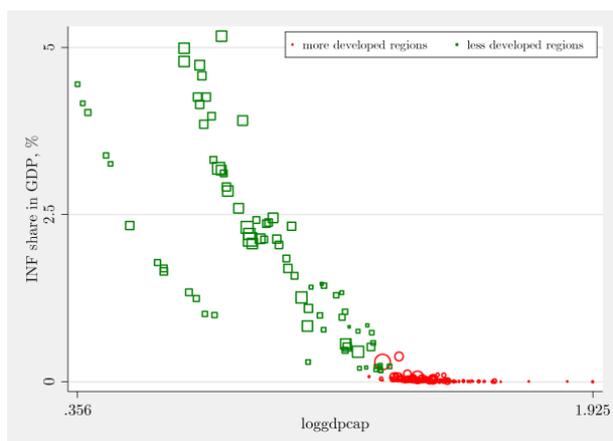
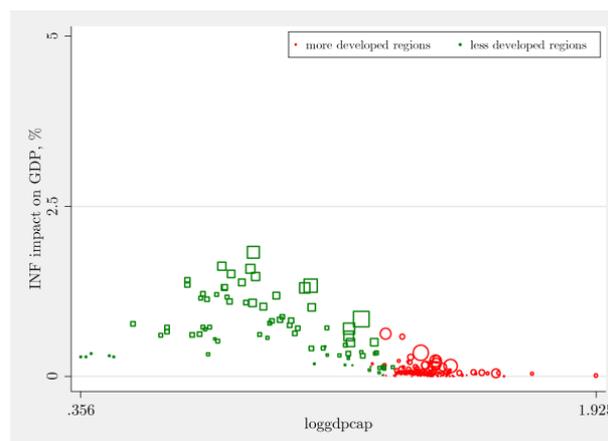


Figure 3b: Marginal impact: Share in GDP



Similar to Figure 3a, Figure 3b suggests that the *less developed regions*, most of which receive a larger share of the Cohesion Policy investment in transport infrastructure than the *more developed regions* (y axis in Figure 3a), tend to benefit more also in terms of GDP (y axis in Figure 3b). Compared to Figure 3b, the vertical distribution of scatter plots is more equal in size when compared to Figure 3a. Once more, this shows that the policy-induced welfare gains (Figure 3b) are spread between the *less developed regions* and the *more developed regions* more equally compared the funding assigned (Figure 3a). Hence, while on the whole Cohesion Policy investment in transport infrastructure fosters convergence between the regions in the EU, of the effects on growth in the more developed regions are positive.

Figure 3b suggests an inverse U-shaped relationship between the returns from transport infrastructure investment and the level of regions' development and competitiveness. Again, this result can be explained, e.g., by inter-regional differences in the marginal impact of infrastructure investment on regions' accessibility (Figure 1b). Larger marginal GDP gains per 1 EUR of infrastructure investment reported in Figure 2b are in line with larger marginal gains in accessibility per 1 EUR of infrastructure investment reported in Figure 1b.

The inverse U-shaped relationship between the returns from transport infrastructure and the level of regions' development and competitiveness could be explained also by the economic geography forces underlying the RHOMOLO model. Reducing trade costs between regions, increases access of a region to other regions' markets. On the other hand, other regions have better access to consumers in the region, which increases the competition for domestic firms. Given that firms are mobile in RHOMOLO, firms located in the *less developed regions* may be less productive and hence less competitive. This suggests that in the *less developed regions* the latter effect likely will be stronger than the former effect.

Given the peculiarities of EU regions (the particular level of increasing returns to scale, localised externalities, imperfect competition and accessibility of each region), the agglomeration and dispersion effects determine the location choices of economic agents (workers and firms) in the RHOMOLO model. In the RHOMOLO model a particular set of economic agents' location choices, where no economic agent has an incentive to change his location, is referred to as a *spatial equilibrium*.

A policy intervention, such as a transport infrastructure improvement, disturbs the spatial equilibrium, by affecting the accessibility and hence the relative competitiveness of regions. For example, improving the accessibility (reducing transportation costs) from a region to all other regions would increase the profits of firms and utility of workers located in the particular region, because of increase in firm output, decrease in average production costs, lower prices for final demand and intermediate goods. This would trigger firms and workers from other regions to relocate to the particular region, until market crowding effects (increased competition on input and output markets) would drive the inter-regional differences in firm profits and worker utility in the particular region with respect to other regions to zero.

5. CONCLUDING REMARKS

Regional development in the EU and regions of the Member States shows an uneven geographic pattern which shifts with time. European Cohesion Policy provides the means for partially offsetting the adverse effects of economic integration and for assisting the less developed regions. In negotiating the allocation of funds, and even in selecting the categories of investment to be supported, the Member States attempt to maximise the benefits of belonging to the single market. Politically, it is almost inevitable that the negotiations will focus on the expected direct effects and financial benefits and on the desired shifts in demand. From the EU point of view, however, the interest is much more on assessing how much in the long term the EU economy as a whole benefits from the advantages of the single market and on making sure that, while further opening the market, the development potential and innovation capacity of all regions is fully exploited, leaving no regions behind. For the purpose of being able to calculate and show the indirect and long-term effects of EU funding as well as the effects of EU policies at the regional level, this paper presents a spatial general equilibrium model in which the economies of all NUTS2 regions are linked through international trade, factor mobility and spatial knowledge spillovers.

The simulation exercise with the RHOMOLO model highlights what is at stake. In the simulation exercise, the reduction in transport costs resulting from the investments in transport infrastructure financed with contributions from the Structural and Cohesion Funds are carefully assigned to the regions and to all bilateral connections between them. Even though, the largest part of the funding in the category of infrastructure is directed towards the Member States that joined the EU in the past decade, it can be shown that the Cohesion Policy investments have positive effects on the more central regions as well, precisely because they benefit from improved connections with so many of the regions to which the funds are allocated. This reinforces the point that, although with the enhanced mobility of capital and firms it may be difficult to simulate where the demand and shares of profits will end up, it could in principle be possible to find a redistribution of the benefits of greater economic integration that leaves all regions better off.

Our simulation results also suggest that, through inter-regional linkages, e.g. trade of goods and services, the positive impact on GDP spills over from the 'treated' regions to other

regions, which do not directly benefit from transport infrastructure investments. The spatial spillovers tend to increase over time, suggesting that in the long-run all regions, even those regions where the infrastructure investments do not take place, would benefit from transport infrastructure investments. Hence, our results indicate that the indirect spatial spillover effects are important, which underlines the necessity for a holistic approach to policy impact assessment.

As a conclusion, from a policy point of view, it should be stressed that the availability of Structural and Cohesion Funds enables individual regions to develop their capacity for improving both productivity and the standard of living. The closer the investments are directed at remedying the structural impediments and removing the bottlenecks to regional development, the greater will be the potential for reaping the benefits of economic integration. The strategic choices of the Member States and regions are increasingly scrutinised and the model presented in this paper may help to cope with the interactions and show which scenarios of public investment support would be most beneficial for the EU economy.

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FOREIGN EXCHANGE INTERVENTIONS AS AN (UN)CONVENTIONAL MONETARY POLICY TOOL: MID-TERM EVALUATION¹

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Key words: *FX interventions, Exchange rate pass-through, Zero lower bound, Central bank loss*

ABSTRACT

The zero level of interest rates constitutes a limit of this standard monetary policy instrument. On the example of the Czech Republic we argue that in such a situation foreign exchange interventions represent a meaningful monetary policy tool for small open economies with abundant liquidity. We provide an overview of the evidence of the functioning of FX interventions and the exchange rate pass-through to consumer prices. Finally we provide an evaluation of the Czech Republic experience with the use of exchange rate tool in 2013.

¹ Theoretical ex-ante part of the paper is based on Lízal and Schwarz (2013).

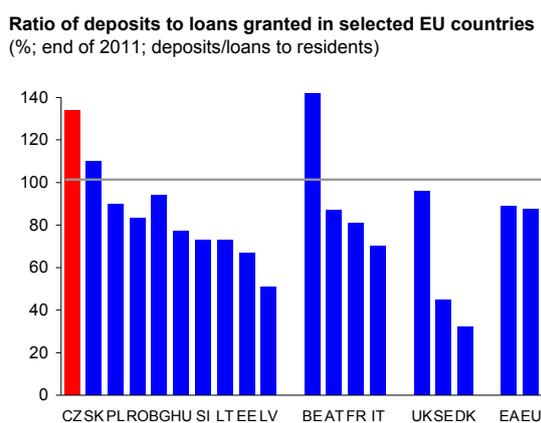
1. INTRODUCTION

The latest, but lasting, economic difficulties have prompted a prolonged period of monetary easing worldwide. A significant number of (important) central banks have lowered their rates in response to the crisis in order to mitigate its consequences and meet their monetary (and other) goals and have announced that they expect rates to be at low levels for a significant period of time. The dismal status of the financial sector has also prompted the use of other, unconventional tools in order to boost the liquidity and maintain the stability of particular segments of the financial sector.

The long-lasting economic stagnation has thus left a number of central banks facing the limits of the standard monetary policy instrument – policy interest rates are often approaching the zero level. Depending on the particular situation of their economy and financial sector, central banks have turned their attention to various unconventional monetary policy measures, such as a negative interest rate on deposits (as used, for example, by the National Bank of Denmark and the Swedish Riksbank, and lately followed by the ECB or the Swiss National Bank), various forms of liquidity provision through quantitative or qualitative easing, and foreign exchange interventions.

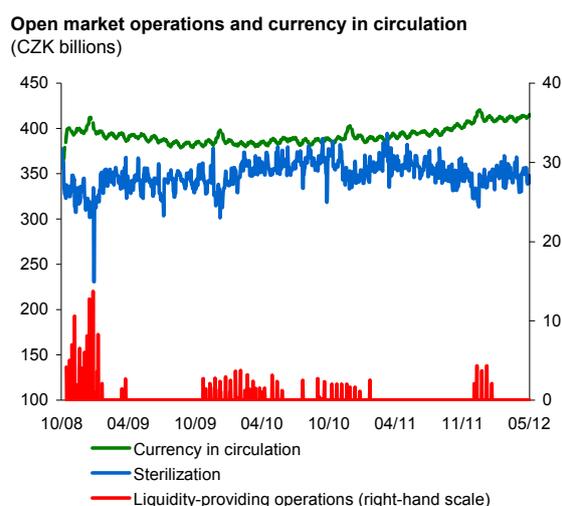
The Czech National Bank (CNB), an inflation-targeting central bank, has also approached the zero level. However, the position of the CNB and the situation of the Czech financial system are rather dissimilar to those faced by the Fed, the BoE, or the ECB. The major difference determining the choice of another monetary instrument in the Czech Republic is neither the size of the economy nor the magnitude of the economic downturn. Whereas most economies have been hit by a severe liquidity crisis and a subsequent credit crunch as a result of the global financial crisis, the Czech financial system is characterized by an abundance of liquidity. Its source was and is the inflow of foreign exchange into both the private and the public sector. Not only is the ratio of deposits to loans well above the EU average (see Figure 1), but total deposits exceed total loans. The significant excess liquidity is absorbed by the CNB using repo tenders.

Figure 1. Ratio of deposits to loans



Source: ECB

Figure 2. Open market operations



Source: CNB

In 2008, on the eve of the crisis, the CNB even introduced liquidity-providing repo operations, but they were used only very rarely (Figure 2) despite having an important psychological effect. However, due to the excess of liquidity, the introduction of a liquidity-providing program along Fed, BoE, or ECB lines cannot be expected to have a significant, if any, impact in the Czech economic situation.

Experience with negative deposit interest rates is still very limited and the economic consequences are in general unclear, in particular the lowest rate possible is not known and most likely country specific. Moreover, in some pieces of legislation in the Czech Republic, penalty interest is bound in a multiplicative manner to the discount rate. This may lead to severe legal complications if the rate is lowered below zero. In addition, the general legislation forbids negative interest rates in certain types of contracts.

As a consequence, given the abundance of free liquidity in the financial sector, foreign exchange (FX) interventions have been selected as the most appropriate monetary policy tool when interest rates hit the zero bound and cannot be lowered any further. Moreover, given that the Czech economy is very open and FX interventions are among the standard instruments of monetary policy, it seems only logical to choose them over the alternatives.

On November 1, 2012, the CNB lowered the two-week repo rate – its key monetary policy rate – to “technical zero” (0.05%). Following an internal debate about the other monetary policy instruments usable for further monetary easing outlined above, the Bank Board decided that FX interventions would be used where necessary to lower the value of the Czech koruna and decided to publicly communicate the choice of this instrument well in advance in order to transparently reduce the market uncertainty about the looming zero-rate threshold and to avoid a loss of ability to influence monetary-policy relevant inflation and inflation expectations in the event of a prolonged recession and a need for further monetary easing.

Under inflation targeting (IT), the monetary policy tool is the interest rate. The exchange rate is not a tool, but an endogenous variable affecting future inflation expectations. The crucial general issue when dealing with FX interventions is therefore the question of their compatibility with inflation targeting. Is influencing FX contradictory to IT? Leaving aside technical and procedural compatibilities, does it compromise the credibility and goals of the central bank? The theory also states that FX interventions can have an impact only through expectations about depreciation/appreciation of the currency or the risk premium of the country.

The IT theory gives very little, if any, guidance on FX interventions. On the contrary, it assumes and usually recommends pure floating with no role for exchange rate management, because in this framework monetary policy affects the exchange rate through the interest rate. The only way in which the exchange rate enters the whole process is through the future inflation forecast influencing the interest rate.

And it is exactly this implicit reaction of monetary policy to exchange rate shocks that leads one to question FX interventions under standard conditions. Why intervene in the FX market if we have another monetary variable, the interest rate, at hand? Such behavior cannot be credible, as it contradicts the fundamentals of IT.

Under standard conditions, an unexpected depreciation shock eases the monetary conditions. However, in such a situation the interest rate is increased in order both to prompt appreciation

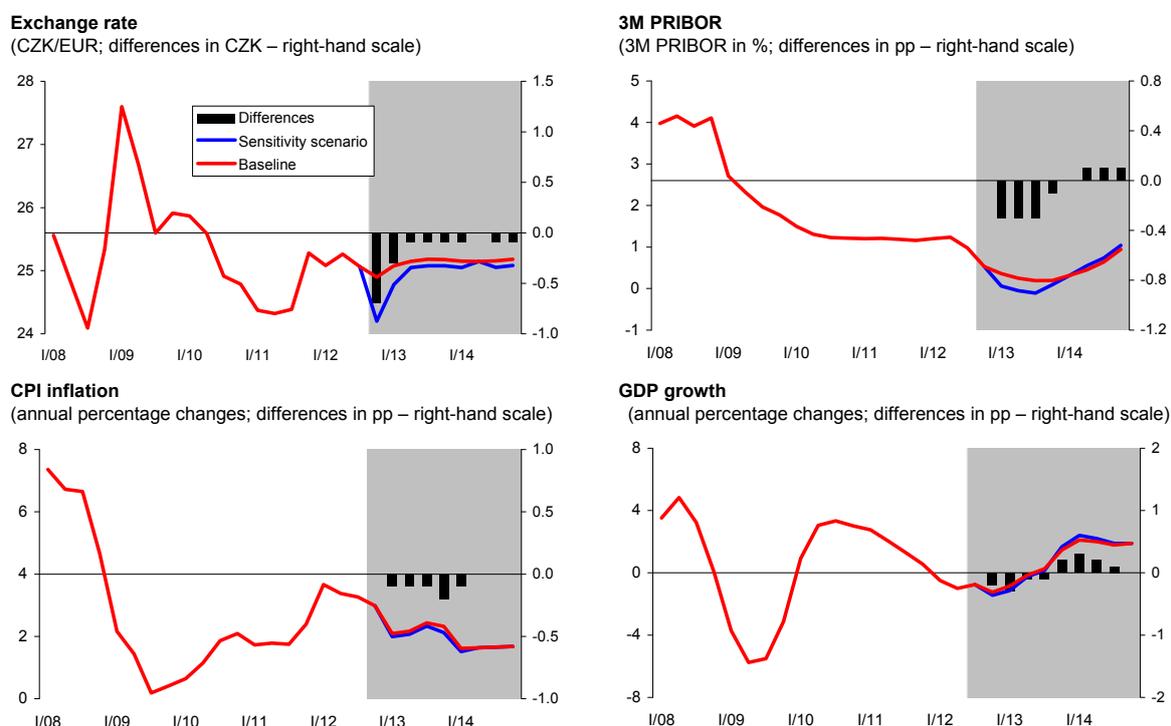
of the currency and to tighten the easier monetary conditions directly. The important consequences are that

- 1) the implicit reaction of the monetary policy instrument strongly affects our ability to estimate the true effects that FX interventions have on macroeconomic variables, and
- 2) in the situation of a zero lower bound, appreciation shocks cannot be accommodated by a standard interest rate cut to ease the tighter monetary conditions caused by the exchange rate shock.

Figure 3 shows an example of the effects of a 3% exchange rate shock under the standard situation (with no zero bound and hence with an accommodating monetary policy tool) on the Czech economy. This exercise is commonly used as a sensitivity scenario by the CNB in its inflation reports. The graphs reveal only a very modest reaction of both CPI inflation and GDP growth to the exchange rate shock.

The crucial question is to what extent do the results of the exchange rate fluctuations shown hold for the effects of FX interventions on the Czech economy if the need arises to use them to further ease monetary policy. What is the experience with FX interventions, and can we build on that experience? How does the zero lower bound on nominal interest rates change the situation? In the following sections we will try to shed some light on the issues inevitably brought up by such questions in line with the argument outlined above.

Figure 3. The CNB's exchange rate sensitivity scenario (a 3% appreciation shock)



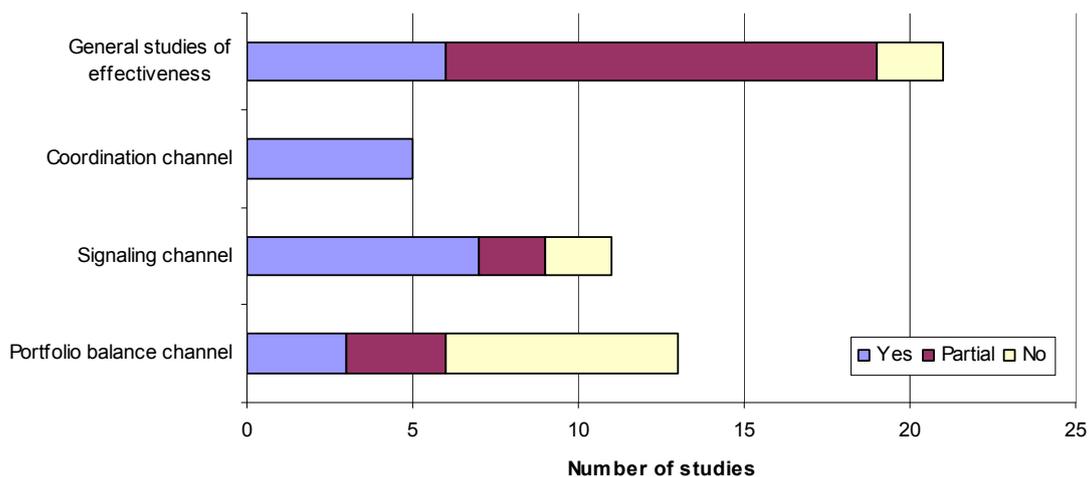
Source: CNB Inflation Report IV/2012

2. INTERNATIONAL EXPERIENCE WITH FX INTERVENTIONS

First, let us focus on the case of known interventions under the standard situation in actual practice. The number of official floaters is steadily increasing, but we still observe a “fear of floating” (Calvo and Reinhart, 2002), as many central banks in open economies do intervene regardless of their official position. According to the IMF’s classification, independent floating dominates among IT countries (with 19 countries as of April 2008), but managed floating coexists with this regime, too (10 countries). Moreover, many independent floaters do actually intervene at least occasionally, with interventions having been more common during the recent crisis: Brazil in October 2008, Chile in January 2011, Indonesia in October/November 2008, Israel in 2008–09, Mexico in 2009, New Zealand in 2007, Poland in April 2010 and from September 2011 to December 2011, South Korea in 2008–09, Switzerland since 2009.

Numerous proposals for managed floating regimes had already been put forward before the 2008 crisis (e.g., Bofinger and Wollmershaeuser, 2003; Goldstein, 2002). The core of the idea is that if the central bank was able to reduce exchange rate volatility, it could achieve a better trade-off between inflation and output variability. However, two important questions remain unanswered: Can the theoretically meaningful outcome really be achieved in practice? And can it be achieved without harming central bank credibility, the cornerstone of the inflation-targeting monetary policy regime? Cavusoglu (2010), reviewing studies which investigate the effectiveness of interventions, found that interventions have a significant short-lasting effect on exchange rates mainly through the signaling and coordination channels. But only a few studies have provided evidence that interventions have been effective in the longer term. Studies focused on the general effectiveness of interventions, not on any particular pass-through channels, give a very mixed picture. The findings are summarized in Figure 4.

Figure 4. Do interventions work?



Source: Cavusoglu (2010)

When we limit ourselves to cases where interest rates are close to zero, only two countries have experience with interventions – Switzerland and Japan. Both are, however, very specific cases (safe haven currencies and reserve currencies) where the central banks struggled to keep their currencies from further appreciating during periods of flight to safe assets.

Probably the best example of a country comparable to the Czech Republic with recent experience of large-scale interventions is Israel. Israel, like the Czech Republic, is a small open economy, the Bank of Israel (BoI) targets inflation, and the Israeli spot FX market is similar in size to the Czech one. However, the purpose of the interventions was different and hence has limited relevance from such a perspective: Israel's interventions were motivated by exchange rate policy considerations rather than by FX being a monetary policy tool. The first round of interventions took place in March 2008 with the primary goal of increasing Israel's FX reserves. At the end of March, the BoI started buying about \$25 million a day, and in July 2008 the average daily rate of purchases was increased to \$100 million. In August 2009 the BoI abandoned regular unidirectional interventions and introduced the possibility of ad-hoc bidirectional interventions, i.e., of buying and selling shekel at any time in the event of large movements in its exchange rate not only in the case of market failure in the FX markets, but also in situations where the development of the exchange rate was inconsistent with economic conditions. Between March 2008 and July 2012 the reserves of the BoI increased from \$29.4 bn to \$75.4 bn. During the period of interventions the FX reserves grew by 164% to more than 30% of GDP by the end of 2011. We can conclude that in the case of Israel a large volume of purchases was needed, but their impact on the exchange rate was not very clear, as numerous currencies depreciated during the observed period. Also, the fact that the BoI never officially terminated the interventions points to possible exit strategy difficulties.

3. CZECH EXPERIENCE

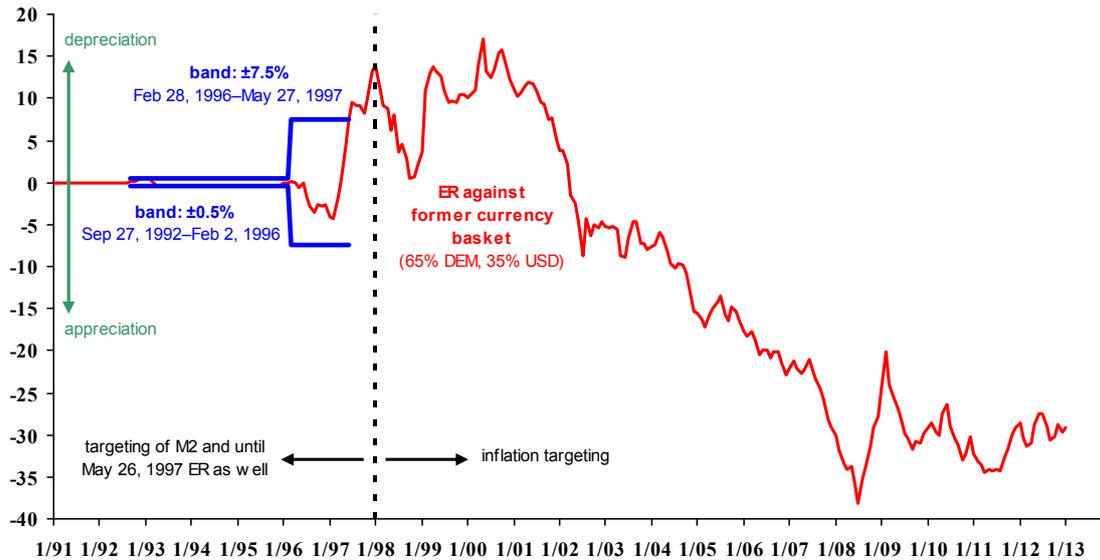
The Czech exchange rate regime shifted from a fixed to a floating one in 1997 (see Figure 5 for the evolution of exchange rate policy). Since then, the CNB has intervened in the FX market in three distinct periods, almost always against appreciation of the koruna. The first intervention period took place between February and July 1998, the second between October 1999 and March 2000, and the third between October 2001 and September 2002. But the evidence on the effectiveness of these interventions (see Figure 6), is mixed. Sometimes there was a visible immediate impact which lasted up to 3 months. In other cases the effect was less clear, was weak, or was transient. Of course, without knowing the counterfactual this evidence cannot be used to convincingly address the impact of the interventions in question. However, there are several studies that address the effect of the CNB's FX operations on the FX market.

Disyatat and Galati (2007) found that the interventions of 2001–2002 had some (weakly) statistically significant impact on the spot rate and risk reversal, but that this impact was small. They did not find evidence that the interventions had had an influence on short-term exchange rate volatility. Geršl and Holub (2006) found the interventions had probably played a minor role in influencing the exchange rate in the short run at best. According to them, the interventions contributed to increased volatility of the exchange rate, but only to a limited extent. According to Geršl (2006), the interventions had only a small short-term effect on the exchange rate level and to a certain extent contributed to increased conditional and implied volatility. And finally, Égert and Komárek (2006) conclude that from mid-1998 to 2002 koruna sales were effective in smoothing the path of the exchange rate for up to 60 days. This was not the case from 1997 to mid-1998.

In 2004 the CNB started selling a part of its yields on FX reserves (these sales were recently discontinued). Starting in June 2007, the previously discretionary approach to reserve sales, with the timing and size of sales not pre-announced, was changed to a regime of daily sales. Dominguez, Fatum, and Vacek (2010) analyze whether the euro-denominated reserve sales

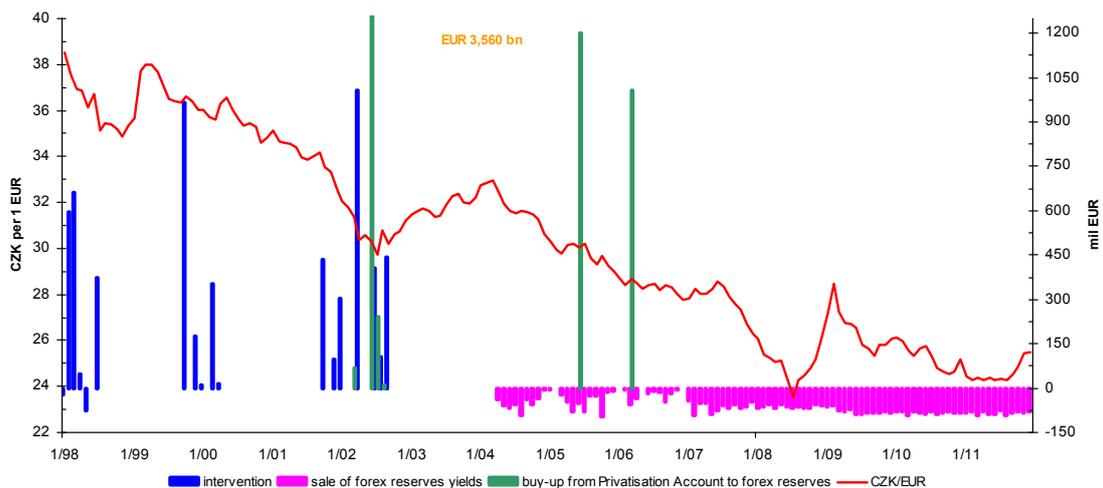
influenced the CZK/EUR rate and reach an interesting and slightly counterintuitive conclusion: over the period of the discretionary regime, there is little evidence that the sales influenced the koruna. However, starting in 2007, when the CNB sold euros every business day, the decumulation of reserves led to statistically significant appreciation of the koruna against the euro. One possible explanation is that in the ad-hoc regime the traders intentionally go against the market in order to minimize volatility, and the market trend dominates the effects of the sales.

Figure 5. Czech exchange rate and monetary policy regimes



Source: CNB

Figure 6. Past interventions and other operations on the Czech FX market



Source: CNB

4. EXCHANGE RATE PASS-THROUGH TO CONSUMER PRICE INFLATION

The existing international and Czech empirical evidence suggests that FX interventions have the ability to influence the exchange rate, even though this may not always be the case in the long term. Fatum and Pedersen (2009) made an interesting observation in this context when studying the effects of sterilized FX interventions of the Danish central bank. They found that interventions exert a significant influence on exchange rate returns only when the direction of intervention is consistent with the monetary policy stance. This is exactly the case when an FX shock is NOT accommodated, but rather fueled, by monetary policy inactivity. This also justifies FX interventions being used as a tool of monetary policy when the interest rate has reached the zero limit and further easing is necessary to meet the inflation target. When the interest rate can no longer be used or is insufficient to influence inflation expectations and achieve price stability, FX interventions become a viable option.

Knowing that FX interventions have the ability to influence the exchange rate and are not in contradiction with IT under the zero-level limit is only the first step toward their practical use as a tool for achieving the inflation target.

The next, practical step is to quantitatively assess the exchange rate tool. The question we need to address first is how exchange rate changes affect prices in the Czech Republic. In other words, we need to address the relevance of existing simulations of exchange rate pass-through.

The results of existing empirical analyses of the transmission of an exchange rate shock to Czech inflation lie in a relatively wide band of 0% to almost 80% (see Figure 7) and are hard to compare due to substantial differences in the methods, empirical specifications, and time series spans used. Also, a slight decreasing tendency in exchange rate shock pass-through over the last decade is apparent. One of the most recent estimates – an impulse response based on a vector autoregression (VAR) model estimated on quarterly data for 1998Q1–2012Q3 (depicted in Figure 8) – suggests pass-through of nearly 8%. We do not have any evidence on whether the decreasing trend in the pass-through is due to the methodology used, to better monetary policy adjustment fully compensating the exchange rate shocks, or indeed to a change in the characteristics of the underlying transfer channels.

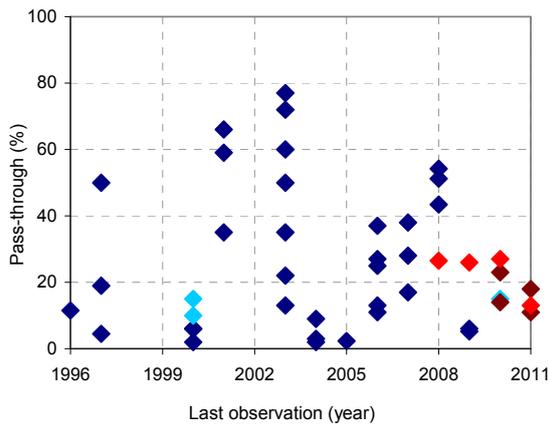
In the standard inflation-targeting regime, an exchange rate shock transmits through both a direct channel (import prices) and an indirect channel (economic activity), taking into account the endogenous reaction of all other variables, including interest rates. Through the direct channel of import prices the exchange rate change passes through to consumer prices almost immediately. However, exchange rate changes influence not only prices, but also, with some lag, real volumes of imports and exports, which consequently cause changes in the rate of growth of wages and employment. The labor market is thus the means of indirect pass-through of the exchange rate shock to consumer prices. This pass-through, however, is moderated by the reaction of interest rates. The movement of interest rates not only causes a correction in the nominal exchange rate, but also, by changing real interest rates, influences investment and private consumption.

Other estimates, based on Bayesian vector autoregression model (BVAR) and vector autoregression model with time-varying parameters (TVP-VAR),² published in Babecká

² Compared to standard VAR model, which is used to capture interdependencies among multiple time series, Bayesian VAR allows to impose a priori information on the model parameters and mitigate the over-

Kucharčuková et al. (2013) lie in the interval of 13–26% (see the red points in Figure 7). The reaction of consumer prices to a shock is rather quick, peaking after about four quarters. The impulse response based on the CNB's core dynamic stochastic general equilibrium (DSGE) forecasting model³ is very similar to the empirical evidence in both the strength and the timing of the pass-through. Analyses conducted in the CNB indicate that the strength of the response to an exchange rate shock gradually decreases along the distribution chain. The largest pass-through (over 50%) is observed for import prices; the transmission of the shock to industrial producer prices and to consumer inflation is an order of magnitude lower.

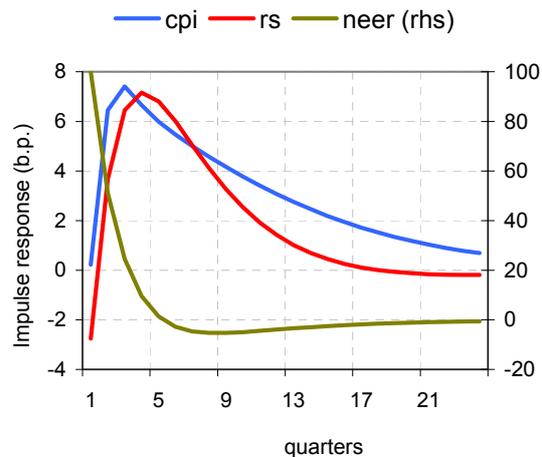
Figure 7. Exchange rate pass-through to Czech inflation based on a literature review



Note: The figure shows the reaction of consumer prices to an exchange rate shock of 1%. It summarizes 43 ERPT estimates for the Czech Republic collected from 22 papers and articles published in 2001–2012. Dark blue points represent time-invariant estimates. Light blue points are medians of time-varying estimates. Results based on Babecká Kucharčuková et al. (2013) are in dark red (VAR) or red (BVAR median and TVP-VAR for 2008Q1, 2009Q1 and 2010Q1).

Source: CNB

Figure 1. Impulse response of the CPI and the short-term interest rate to a Czech koruna depreciation of 1% (VAR model)



Note: The generalized impulse response is based on a VAR model estimated on quarterly data for 1998Q1–2012Q3. The vector of endogenous variables contains Czech GDP, the consumer price index (cpi), 3M PRIBOR (rs), the nominal effective exchange rate (neer), and monetary aggregate M2. The exogenous variables are the IFS All Primary Commodities price index, euro area GDP, and 3M EONIA.

Source: CNB

5. INFLUENCE OF THE ZERO LOWER BOUND ON PASS-THROUGH

As rates approach the zero lower bound (ZLB), the transmission of shocks to the economy may change, as we document using various instances of similar phenomena (one parameter fixed, decreased degrees of freedom). Take, for instance, Bayesian fan charts, which are used to predict the future development of an economy as it reacts to various exogenous shocks. During times of standard monetary policy, central banks do not explicitly address the issue of the ZLB on the nominal interest rate when constructing fan charts. However, there are several possible approaches to forecasting at the ZLB.

parameterization problem. VAR with time-varying parameters enables to capture changes in underlying structure of the economy.

³ The DSGE methodology focuses on explaining economic phenomena using macroeconomic models based on microeconomic foundations. Therefore, DSGE models should not be vulnerable to the Lucas critique.

First, forecasts can be conditioned on shocks that lead to a non-negative nominal interest rate. Second, forecasts can be conditioned on the interest rate itself, regardless of the shocks hitting the economy. And finally, the ZLB can be ignored completely.

Franta et al. (2014a) show on Czech data that, depending on which types of shock we exclude from the construction of the simulated density forecasts, we can introduce different types of bias. In the first approach, all shocks which directly or indirectly imply a decreasing interest rate are filtered out. For example, a negative demand shock, which usually leads to fall in output, inflation, and the interest rate, is also discarded by this approach when the economy reaches the ZLB. As a consequence, negative demand shocks are less likely to be included in the simulated density forecast than positive demand shocks.

The second approach imposes zero on all negative parts of the interest rate path, but constructs the density forecast using all draws of shocks. For example, a negative monetary policy shock, which is not possible at the ZLB, gets into the sample of forecasts from which the density is sampled. Even though such a shock does not have any impact on the nominal interest rate, it immediately affects the exchange rate and thus other variables in the following periods.

In the last case, not only all draws of shocks, but also possible negative lagged values of the nominal interest rate are used to construct the density forecast. We do not intend to discuss the question of the accuracy or usefulness of the individual approaches, but they do allow us to demonstrate the difference in forecasts, i.e., the theoretical responses of the economy to shocks when the zero interest rate limit is binding. As Franta et al. (2014a) demonstrate, the differences in the forecasts can be sizable (note the differences in the vertical scales). Not accounting for the ZLB at all leads to ex-post observed monetary-policy-relevant inflation being on the edge of the centered 95% of the distribution forecast. A similar result is observed if a zero nominal interest rate is imposed following the second approach mentioned above. Ignoring the ZLB also leads to an over-optimistic outlook for real output growth. These results highlight one important finding: the models we use in normal times will not necessarily work correctly as the economy approaches and hits the zero lower bound on nominal interest rates.

As shown by many authors (e.g., Portes, 1969), fixing one input or binding constraint in effect leads in general to higher responsiveness (or volatility) of the remaining variables, *ceteris paribus*. This is also true for the exchange rate pass-through with the ZLB binding. When monetary policy acts to stabilize the economy and reacts transparently to an exchange rate shock, the exchange rate pass-through to inflation is relatively small, as the above-mentioned empirical evidence suggests. But the transmission of an exchange rate shock changes as the central bank approaches the ZLB and interest rates cannot counteract the shock. Depending on how long economic agents expect monetary policy to operate in the ZLB regime, the pass-through of the exchange rate to inflation increases sizably. The first channel is import prices, which directly cause higher inflation without a stabilizing reaction of interest rates. The second channel is real interest rates: longer-term fixed nominal interest rates due to the ZLB and gradually increasing inflation push down real interest rates and thereby stimulate real economic activity, for instance private consumption. The two channels therefore work in the same direction.

It is not only monetary policy that is sensitive to the existence of the ZLB. Analogously, in a meta-analysis of fiscal multipliers Gerchert and Will (2012) show that the fiscal multipliers

are significantly higher in a ZLB regime regardless of the subsample of models chosen. We can therefore conclude that the existing studies estimating the size of pass-through are not all applicable in a situation of zero rates, and that the pass-through at the ZLB can be several times larger than past estimates.

6. COSTS OF FX INTERVENTIONS

A major impediment to conducting FX interventions might be their adverse effect on central banks' balance sheets. However, one has to keep in mind that when intervening with the goal of easing monetary conditions, no costly sterilization is necessary because in such a situation the monetary consequences of intervention are in line with the monetary policy objective. But that does not mean that FX interventions are costless. Long-lasting interventions against one's own currency usually lead to a sizable buildup of international reserves. With the local currency appreciating due to the economic convergence of the country, assets denominated in foreign currencies have to be revalued. And if the central bank holds more foreign currency assets than foreign currency liabilities, such revaluation creates financial losses.

As, for example, Stella (2008) and Stella and Lönnberg (2008) point out, the accumulation of losses may have a negative impact on the financial strength of the central bank and undermine the credibility of monetary policy. However, in order to correctly understand the degree of credibility risk, the central bank's balance sheet situation has to be put in the relevant macroeconomic context that the bank faces. Cincibuch et al. (2009) develop a formal framework for assessing the sustainability of the central bank's balance sheet. Taking the long-run trends from the CNB's forecasts and simulating the long-term development of the CNB's balance sheet, they show that the CNB should eventually get into a profit-making situation as economic convergence progresses, and the risk premium, as well as the real exchange rate appreciation trend, is likely to disappear. They conclude that the CNB will be able to repay its current accumulated loss out of future profits.

The long-term sustainability of the balance sheet and the central bank's credibility, therefore, will not necessarily be compromised even in situations of negative own capital if the losses stem from the economic convergence of the country. On the other hand, theoretical expectations are one thing, but the actual ability to pursue monetary policy objectives, such as stabilizing inflation expectations, may be harmed when the central bank becomes financially weak. To analyze the issue, Benecká et al. (2012) empirically address the link between central bank financial strength and inflation. On a panel of more than 100 countries between 2002 and 2009 they find that in a few cases there is indeed a statistically significant negative relationship between financial strength and inflation. But the results lack robustness with respect to the choice of alternative measures of financial strength and econometric technique. Also, there is some evidence that the relationship is non-linear, with only substantial financial weakness being associated with higher inflation, and the link exists only for countries with the lowest level of central bank legal independence and/or relatively high inflation rates.

In general, according to Benecká et al. (2012), the explanatory power of central banks' financial strength indicators is rather weak, while other inflation determinants seem to play a more important and robust role.

7. SITUATION OF THE CZECH ECONOMY IN LATE 2013

As mentioned earlier, the Czech economy experienced a sharp slowdown in 2008 in reaction to the global financial and economic crisis. After one year in deep recession, a gradual recovery in 2010 and 2011 took place while public finance reform was started. The credibility of the public finance reform manifested in low interest rates; the Czech government enjoys lower premium than Euro counterparts, e.g., France. However, in 2012 and 2013 the economy witnessed mild, however protracted, recession again. At this time the economy also started to lag behind its major trading partners as the roots of the slowdown were not imported from abroad, but stemmed from weak domestic demand, too. The EU also experienced period of amebic improvements, various new financial problems and many deep uncertainties. As a consequence, the domestic inflation was decreasing and hit the lower boundary of the tolerance band around the CNB's target by the end of 2013, in spite of VAT and other tax increases taking place in that year (see Figure 9). Monetary-policy relevant inflation was already around zero and also showed a decreasing tendency.

In addition, the so-called adjusted inflation excluding fuel prices, i.e. the indicator of core inflation, had been negative since 2009 due to deep decline in prices of tradable goods and services. Moreover, as Figure 10 reveals, in 2013, for the first time in Czech modern history, the growth of prices of non-tradables, i.e., the index that is the most closely related with domestic situation only, reflects prices of domestic services and gives hints about future wage pressures, got to zero level as well. As this index was historically the highest one, it has signaled very unusual circumstances, especially for a converging economy, and mainly reflected weak domestic demand, no wage growth and even expected wage decline. Together with still-falling prices of properties it was the edge of deflationary spiral forming in the economy.

Figure 9. Czech inflation – actual vs. targets

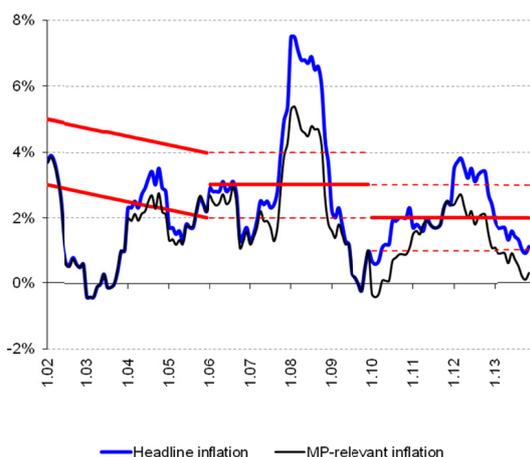
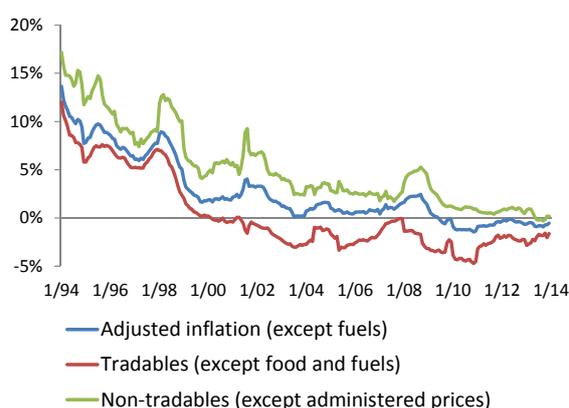


Figure 10. Core inflation – tradables and non-tradables



Source: CNB

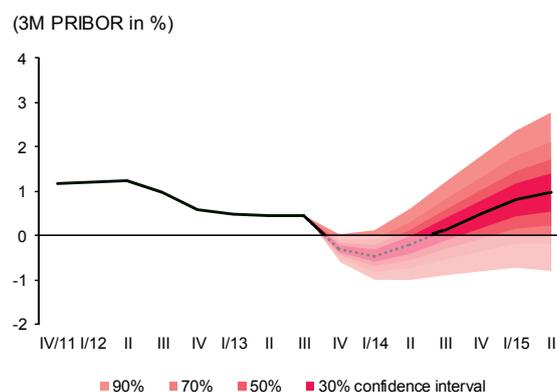
The CNB responded to this development by gradually lowering interest rates to “technical zero” (0.05% for the two-week repo rate and the discount rate, and 0.25% for the Lombard rate) on November 1, 2012. In order to further ease monetary conditions, the CNB communicated that it is prepared to use the exchange rate as an additional instrument if a need arises. Finally, the forecast published in the Inflation Report IV/2013 pointed to a need for clearly negative levels of market interest rate, followed by a rise in rates only at the end of

2014 (see Figure 11). Given the ZLB on interest rates, this pointed to a significant need to ease monetary policy using other instruments.

The baseline forecasting model showed that ignoring this need would have dire consequences for the Czech economy (see Franta et. al, 2014b, for detailed assessment of costs, risks and uncertainties). Moreover, Cook and Devereux (2013) show that the optimal reaction of foreign policy rates to home rates at the ZLB is an increase. Otherwise, the home currency starts to appreciate uncontrollably. However, the situation was complicated by the fact that, according to our reading of the economic development in the euro area, ECB has been expected to significantly ease the monetary policy in the (near) future as well. Therefore, the deadly appreciation spiral was not likely but almost certain to come.⁴

As historical note we add that the ECB indeed decreased its rates just 45 minutes after the Czech FX commitment was eventually announced. Without it, there would be further appreciation spree on the CZK, and consequent unsustainable tightening of monetary policy stance with deflation spiral further propelled by the appreciation.

Figure 11. Inflation Report IV/2013: Interest rate forecast



Source: CNB

8. EXCHANGE RATE COMMITMENT OF NOVEMBER 2013

On November 7, 2013, the CNB Bank Board decided to start using the exchange rate as an additional instrument for easing the monetary conditions. An alternative scenario constructed using the CNB core prediction model revealed that the optimal amount of monetary easing would be delivered by weakening the koruna so that the exchange rate is close to CZK 27/EUR. The exchange rate level was chosen to avoid deflation or long-term undershooting of the inflation target and to speed up the return to the situation in which the CNB will be able to use its standard instrument, i.e. interest rates. The exchange rate commitment was constructed as one-sided. This means that the CNB committed to prevent excessive appreciation of the koruna exchange rate below CZK 27/EUR. On the weaker side of the CZK 27/EUR level, the CNB allowed the exchange rate to move according to supply and demand on the FX market.

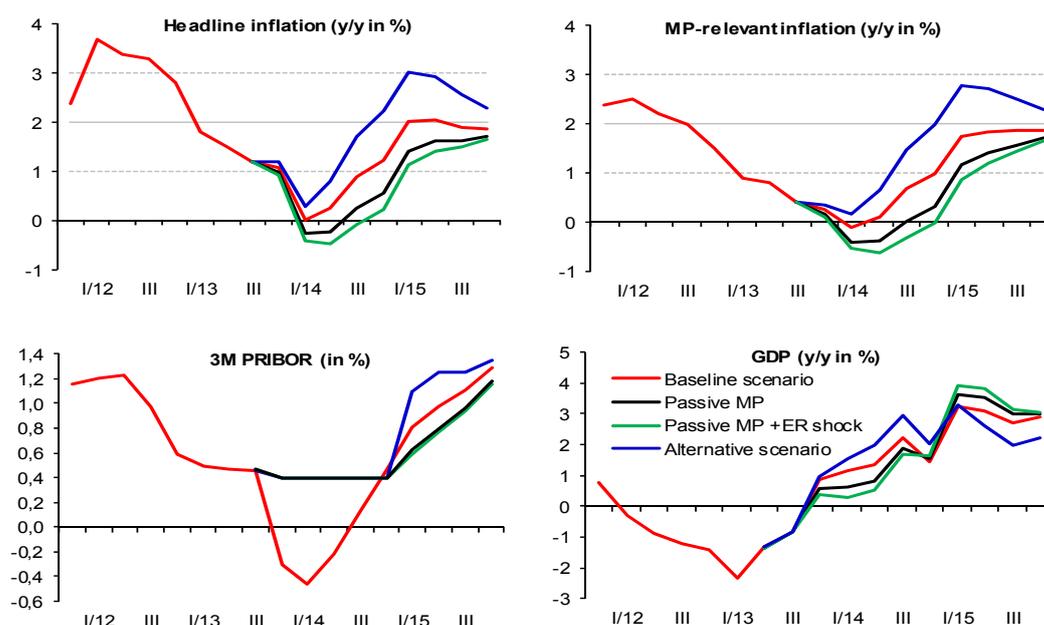
Using the exchange rate as an additional instrument at the ZLB was proposed mainly by McCallum (2000) and Svensson (2001), who proposes a "foolproof way" of escaping from a

⁴ The trading department of CNB, after long period of relative normal trading, indeed signaled development that was revealing of forming speculative positions on currency appreciation.

liquidity trap in an open economy. Svensson argues that such safe way consists of announcing a price-level target path corresponding to a positive long-run inflation target, a devaluation of the currency and a temporary exchange rate peg, which is later abandoned in favor of standard inflation targeting once the price-level target path has been reached. He further argues that “this will jump-start the economy by (1) a real depreciation of the domestic currency relative to a long-run equilibrium level; (2) a lower long real interest rate (since there must eventually be a real appreciation of the domestic currency, and expected real appreciation of the currency is associated with relatively low short and long domestic real interest rates); and (3) increased inflation expectations (since, with the exchange-rate peg, expected real appreciation is associated with expected domestic inflation).” (Svensson, 2001, 280–1)

Note, that Svensson’s (2001) proposal emphasizes the role of inflation expectations as well as the effect of decrease of real interest rate and does not rely on the portfolio-balance channel of foreign exchange interventions as previous authors. The exchange rate peg serves to handle the credibility problem in his approach, as it allows the central bank immediately and credibly demonstrate its commitment to higher inflation rate by means the exchange rate peg. The price-level target makes the temporary peg consistent with long-run inflation target and allows inflation to deviate in short run from its standard target.

Figure 12. Comparison of scenarios constructed using the CNB core prediction model



Note: Baseline scenario = CNB baseline prediction with no limits on interest rate; Passive MP = Active ZLB and no reaction of additional monetary policy tools; Alternative scenario = Active ZLB and FX interventions used as an additional monetary policy tool.

Source: CNB

Although the practical implementation of the CNB commitment is different from Svensson’s model, it has all the necessary features. In a similar manner, the inflation predicted to follow the CNB’s November 2013 FX commitment (see Alternative scenario line in Figure 12) was expected to overshoot the inflation target in order to offset the significant undershooting in 2014. That is, the chosen approach implicitly contained an element of temporary price-level targeting recommended by Svensson (2001).

The commitment to offset past deviations from the inflation target by future developments increases inflation expectations and through a decrease in ex ante real interest rates speeds up exit from the ZLB. However, this element of price-level targeting was implemented without an explicit regime change as assumed in Svensson. As Franta et al. (2014b) argue, the implemented approach is equivalent only from an ex ante perspective – but this was actually needed, the ex ante effectivity. The CNB also weakened the exchange rate as a one-off action and did not introduce a crawl, and announced that a future change of the exchange rate to a weaker level was possible in case of strong anti-inflationary pressures. In these technical aspects, the CNB's approach differed from Svensson's (2001) recommendations.

Actual interventions were quite massive (EUR 7,499 bn.) and resulted in increase in foreign exchange reserves in about 8% of GDP (in terms of the reserves they grew by one third), but took place only for a few days after the policy decision of the CNB. After the CNB's policy announcement, koruna reached CZK 27/EUR quickly, and had been moving at somewhat weaker levels since then (see Figure 13). The exchange rate volatility decreased significantly (both the actual one, and implied by futures prices) in 2014.

Figure 13. CZK/EUR exchange rate

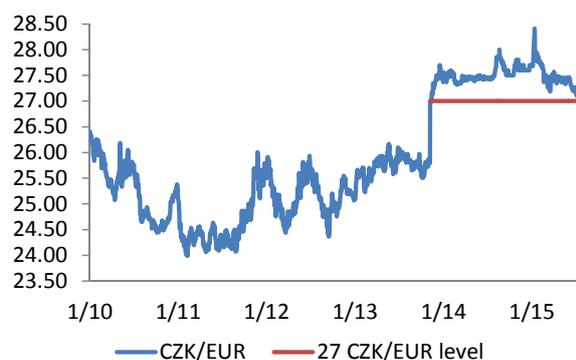
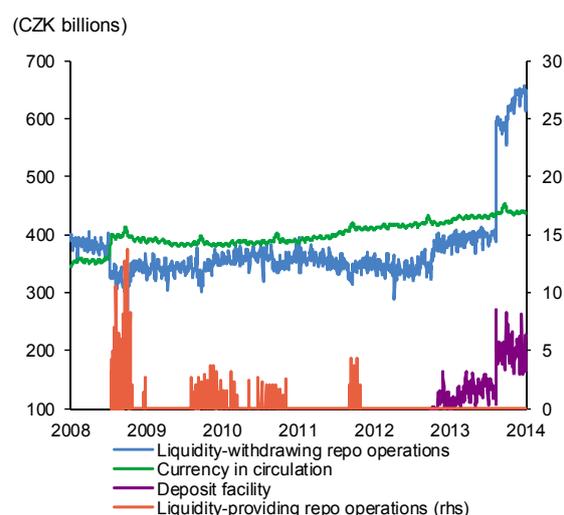


Figure 14. Open market operations and currency in circulation



Source: CNB

9. MID-TERM EVALUATION OF THE EFFECTS

For a long period of time, there was not enough data from the real economy to demonstrate how the FX commitment did help the Czech economy and what were the effects and their channels. Communication of the step and its consequences proved to be very complicated because model predictions were not sufficient to persuade the public. Only by the end of 2014, that is a year after announcing the FX commitment, we finally started to gather real statistical evidence of its longer term effects. Even now with the real economy data the communication is a daunting task.

Table 1 reveals that the development of majority of macroeconomic indicators between November 2013 and March 2015 was changed in a positive way, i.e., in accordance with CNB's predictions. However, one needs to distinguish between the effects of FX commitment from the other sources of changes, e.g., general economic improvement in the euro area.

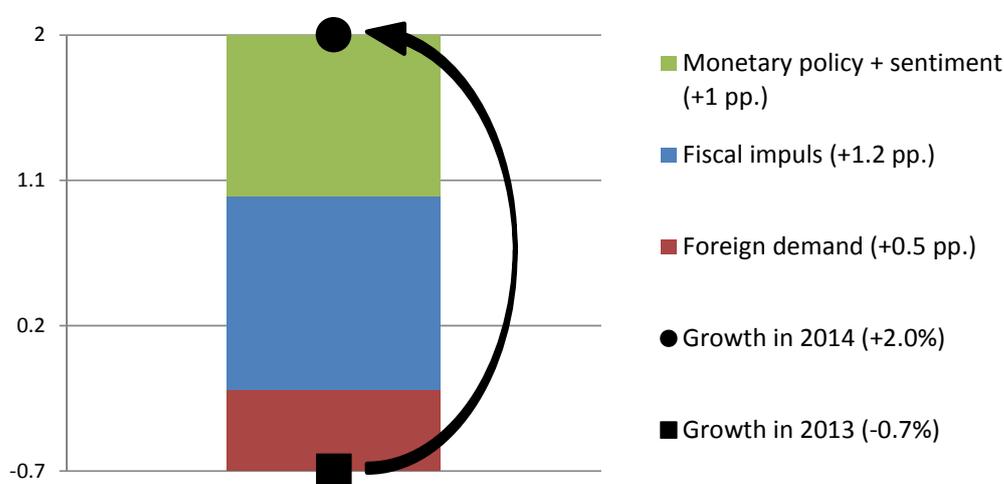
Table 1. Development since November 2013

	Annual percentage changes			
	Available on 7.11.2013		Available on 4.9.2015	
Gross domestic product (s.a.)	II/13	-1.3	II/15	4.4
Consumer price index	9/13	1.0	7/15	0.5
General unemployment rate (in %, s.a.)	9/13	7.1	7/15	5.2
Average nominal wage	II/13	1.2	II/15	3.4
Number of vacancies	9/13	39,040	7/15	98,100
Gross operating surplus of nonfinancial corporations	II/13	1.3	2014	13.3
Insufficient demand as a limit of production in industry (in %)	IV/13	52.0	7/15	45.0
Composite confidence indicator (index)	10/13	88.9	8/15	95.7

Source: Czech Statistical Office

The first assessment naturally uses the change in GDP development but all the factors mentioned in Table 1 provide complex picture. The post-crisis slowdown of the Czech economy had been exceptionally strong compared to other countries in the region. The Czech Republic had been consistently among the 10 worst-performing countries of the EU up to 2013. In the second quarter of 2013, the Czech economy fell by 1.3% vis-a-vis the same period of 2012. In 2014, the Czech economy already grew by 2% and the Czech Republic moved among the top 10 EU members.

Figure 15. GDP change decomposition



Source: CNB

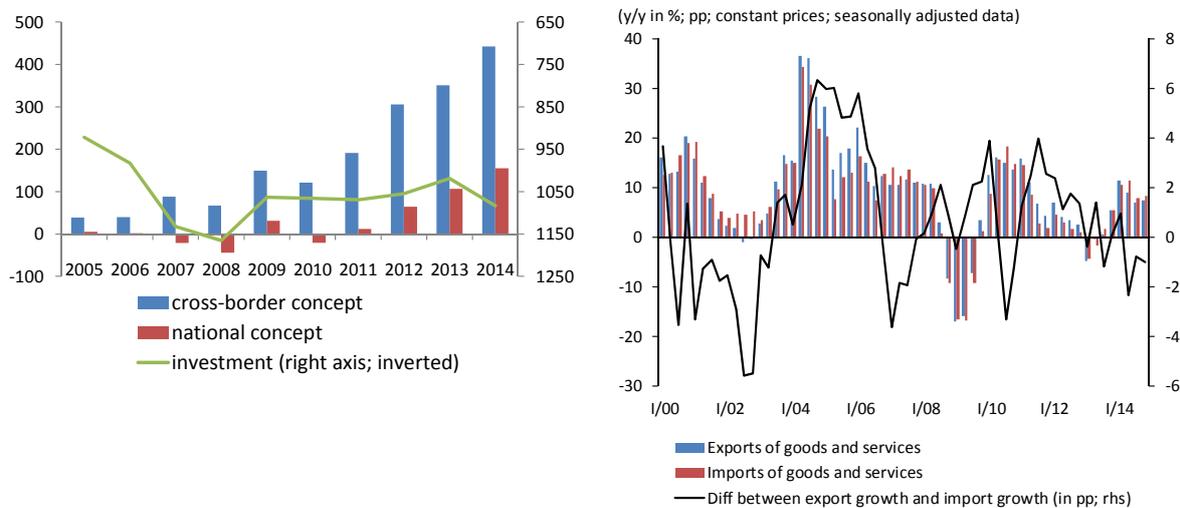
Figure 15 shows simple decomposition of the GDP change with respect to the main factors identified by the CNB's analyses. The change in dynamics of the Czech GDP reached 2.7 percentage points in 2014 (from -0.7% in 2013 to 2.0% in 2014). As we can see, the least important in effect had been the development of foreign demand which is often quoted as the most important factor. However, as the euro area witnessed only moderate recovery, the direct contribution of foreign demand to Czech economic growth was only about 0.5 percentage points, assuming unchanged linkages from the past. Actually more important has been the change in fiscal policy. Its total contribution is estimated at 1.2 percentage points. Note that fiscal policy changed from significantly restrictive in 2013 to slightly growth-enhancing one,

mostly via recovered government investments that have been seriously limited during the earlier fiscal consolidation years. The remaining 1 percentage point can be attributed to the monetary policy action (FX commitment) combined with improved sentiment of businesses and households (as these effects could not be directly separated without further assumptions or usage the main CNB model).

In a similar fashion, unemployment went down by more than 1 percentage point in 2014, the growth of nominal wages accelerated, the number of vacancies almost doubled, and the financial situation of nonfinancial corporations improved notably. These changes are in line with the GDP change, although the wage development has been slower, most likely due to lower inflation, which we will discuss later.

Figure 16. Trade balance surplus and investment

Figure 17. Exports and imports



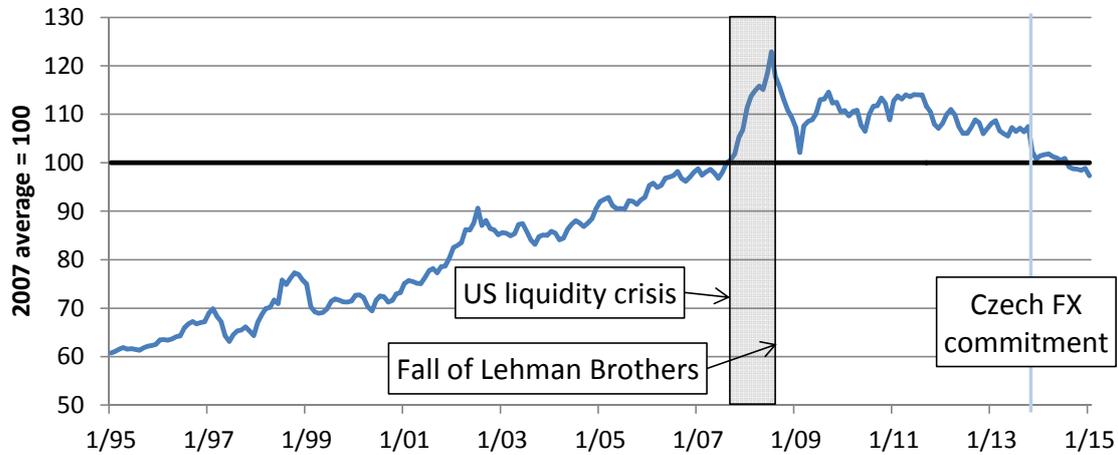
Source: CNB

Figure 16 and Figure 17 document the existing link between investments and foreign trade. As we see from the former figure, the investment was in period 2008-2013 severely reduced. As the investment is the most import-intensive activity, the decline has also affected the trade balance, which surplus has started to grow (the correlation of trade surplus and investment is high, about -0.9). Also when using the assumed import intensity of investment from DSGE (of 80%), we can explain almost all the newly generated trade surplus with the decline of investment. The perceived good results of trade surplus generated additional appreciation pressures, however, as the results of surplus were not caused by higher grow export activities but rather disinvestment, it lead to unsustainable appreciation – there is no economic reason why economy that does not invest into its future should witness long term appreciation tends due to “better prospects.” The appreciation is also visible in REER development as shown in Figure 18. That vicious linkage has been broken with the FX commitment.

In order to address the influence of FX commitment more rigorously and directly, a sensitivity scenario has been constructed using the CNB’s prediction model which compares the forecast from November 2013 with reality and a hypothetical counterfactual scenario had the koruna not weakened. The sensitivity scenario reveals two interesting facts (see Figure 19). First, both GDP growth and inflation would have been significantly lower had the CNB not decided to use FX interventions as an additional monetary policy tool. The difference in

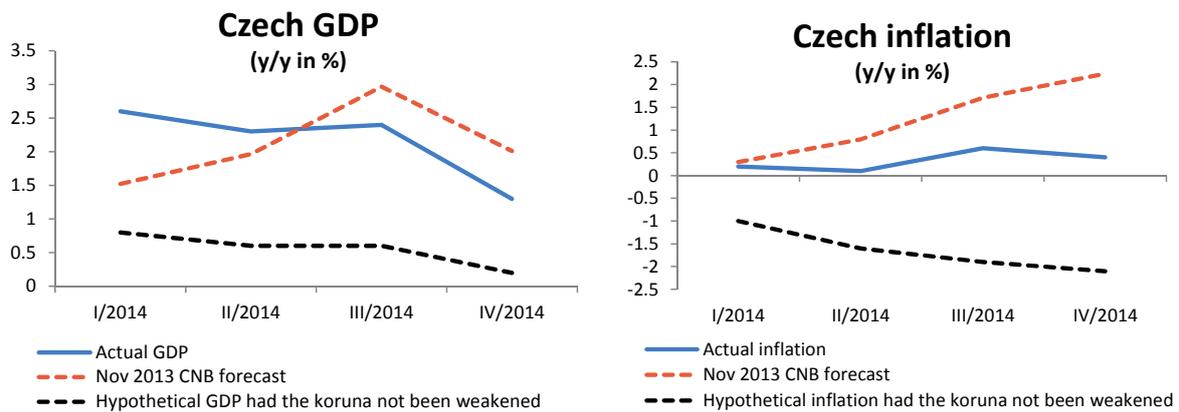
growth between reality and this no-intervention counterfactual is, indeed, close to 1 percentage point, as the simple decomposition provided above suggests.

Figure 18. Real effective exchange rate of the Czech koruna



Source: Bank for International Settlements

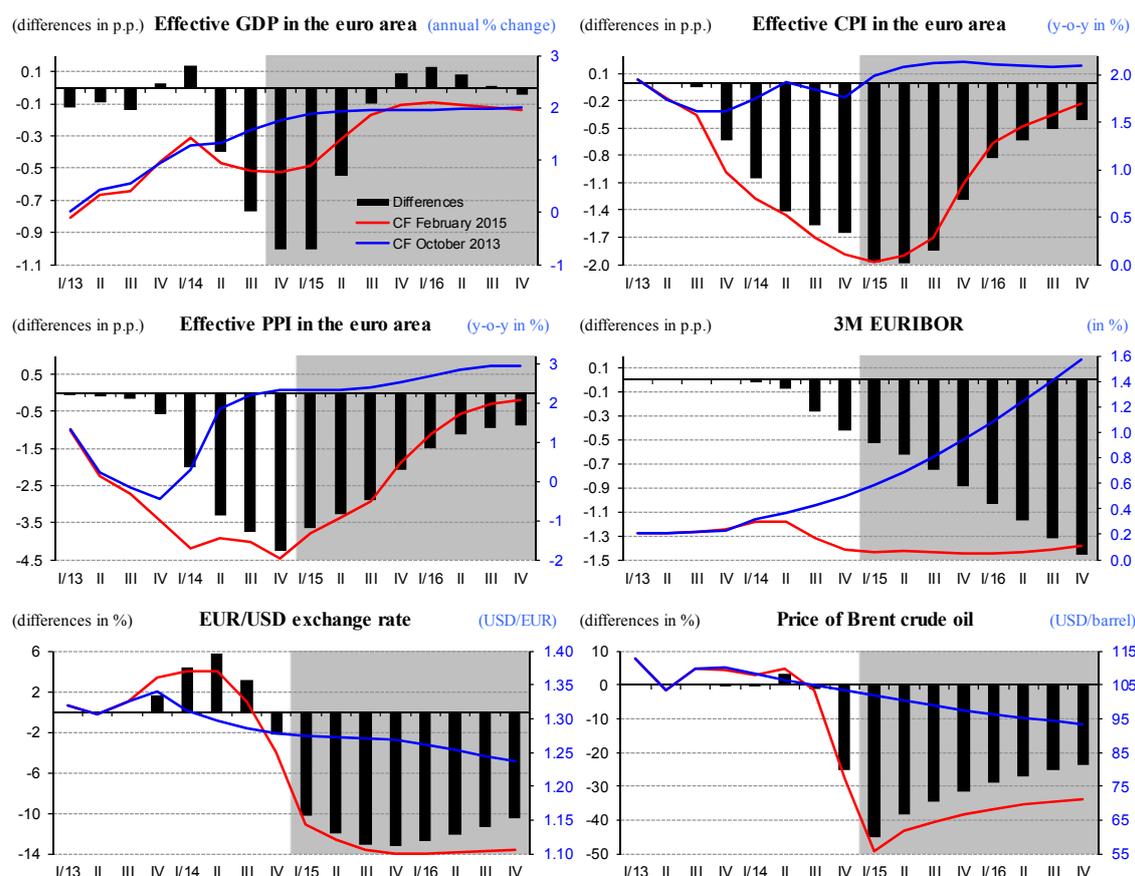
Figure 19. Sensitivity scenario: No interventions



Source: CNB

As the general economic development has been in line with the model predictions, why is the inflation path so different? Inflation seems not to react to the weaker koruna as strongly, as expected in the models. We show that the driver of the difference is indeed the external development. The major reason for inflation staying far from predicted levels and the inflation target are strong disinflationary pressures which the Czech Republic imports from the euro area. Figure 20 illustrates the differences between euro area consensus forecasts for main macroeconomic variables in November 2013, the actual path till February 2015 and forecast since then. Not only was the effective euro area (euro area members weighted by their share on foreign trade vis-a-vis the Czech Republic) GDP growth significantly lower than expected in 2013, but consumer prices growth practically stopped at the beginning of 2015, and producer prices growth was, instead of recovering its growth, further deeper in negative figures.

Figure 20. Euro area consensus forecast in November 2013 and February 2015



Source: Consensus Forecast, CNB

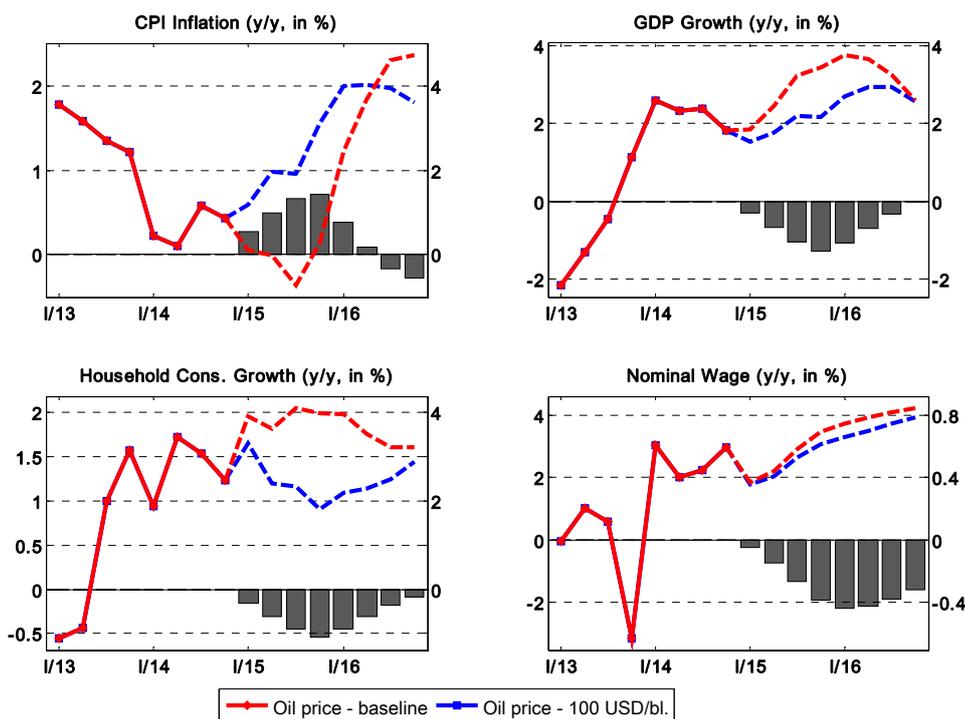
To assess the impact of lower oil prices on Czech inflation, the CNB constructed a sensitivity scenario with oil price fixed at the 2014 level. Figure 21 shows that with oil price around 100 USD/barrel, inflation would be on average 1 percentage point higher in 2015. But, predictably, the GDP growth and household consumption would suffer significantly.

Hence we conclude that the difference in inflation development from the predicted path can be attributed almost solely to factors outside the Czech economy that monetary policy has no effect on. The future development of inflation depends whether the firms that experience the windfall profit due low oil prices will pass part of it to wages and investment. Should the behavioral pattern not change, the secondary effects of low oil price should not lead to new deflationary dangers.

10. CONCLUDING REMARKS

The use of foreign exchange interventions to ease the monetary conditions in an open economy is a rational choice. First, this monetary instrument is used only when interest rates are at a zero level, i.e., when the standard natural tool is no longer available. Second, the power of the central bank when intervening against its own currency is not limited by the size of the reserves. Third, the depreciation helps net exports in the short run, which is a good side-effect stimulating the economy. In essence, in an economy with abundant liquidity in the banking sector, such as the Czech Republic, FX interventions are the only efficient way to implement monetary easing.

Figure 21. Sensitivity scenario: Higher Brent price



Note: Left-hand scale = Annual change in %; Right-hand scale = Difference in percentage points

Source: CNB

As far as the practical implementation is concerned, we firstly note that the implementation can indeed differ from the theoretical models in the literature but has to comprise all the necessary elements. Second, the FX commitment serves well even if the economic development changes, i.e., it showed to be both an efficient tool of monetary easing when needed as well as an anchor to inflation expectations in case the surrounding development would lead to unwanted monetary tightening.

Finally, we would argue that in such a situation FX interventions did not reduce the transparency and credibility of inflation targeting. The inflation target – including the tolerance band around it – remains unchanged and is publicly known in advance. On the contrary, if further easing is necessary the zero interest rate bound prompts questions of credibility due to the primary tool having been exhausted. The prediction of the market interest rate path, despite reflecting the zero level, remains publicly announced. However, the exchange rate itself is still not the target, but rather a new tool for achieving the target. Consequently, it is not meaningful to specify a “target exchange rate.” The desired policy exchange rate changes dynamically over time and is determined by the evolution of the forecasted economic conditions and the targeted inflation rate.

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ENDOGENOUS DEFAULT- WHY AND WHEN DO COUNTRIES WITH FIXED EXCHANGE RATE REGIMES DECIDE TO DEFAULT?

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ABSTRACT

In this paper, the authors try to explain why and when it is rational for the government of a country with an overvalued exchange rate to refuse gradual depreciation and to default. The model is based on the following assumptions. Policy makers seek to maximize (re)election probabilities by evaluating the utility functions of households and firms. In addition, to win the votes of households the government must also gain their trust and remain credible. The credibility is based on the government's ability to keep election promises which include: a fixed exchange rate, refraining from default, provision of public goods and maintaining reasonable tax rates. In a situation of budget deficit, government borrows from the international market. A growing need for financing increases the country's risk and raises the lending interest rates, which in turn reduces both the gross domestic product and the income of households.

The model suggests that policy makers decide to default when the probability of re-election is higher in case of default than in case of maintaining credibility. The model sets the basis for the above mentioned dynamics, which is in line with the stylized facts, and allows for comparative statics exercises.

1. INTRODUCTION

Literature on the history of sovereign defaults suggests that default is rather a policy choice than an inevitable consequence of hard credit constraints (Yong Kyun, 2013, Panizza, et al., 2009). This study aims to explain why and when countries with fixed exchange rate regimes decide to default. In other words, we seek to explain when it is rational for the government of a country with an overvalued exchange rate to refuse gradual depreciation and to default.

It must be stressed out that there is no unique definition of default. However, a sufficiently broad definition, which we follow, states that a default is a situation in which a country does not fully meet its obligations towards its creditors (Villemot, 2012). Like Villemont (2012), we use sovereign debt as a synonym for public external debt, since we assume that the government borrows exclusively from abroad. The latter assumption is based on the fact that a majority of debt in emerging economies is denominated in foreign currency (Asonuma, 2014).

The phenomenon of default has been widely analysed. The first theoretical and empirical model which deals with endogenous default dates back to 1981 when Eaton & Gersovitz tried to explain the paradox of the existence of sovereign debt. The paradox of foreign debt emerges from the fact that sovereign debt contracts are usually not collateralized, which makes their legal enforceability very limited compared to private debt contracts (Martinez & Sandleris (2011), Bulow & Rogoff (1989)). Our paper aims to contribute to current literature by adding a government credibility function which seeks to improve our understanding of sovereign defaults

We base our model on several assumptions. We assume that policy makers seek to maximize re-election probabilities by maximizing the utility of households and producers. To gain the voters' support the government has to retain the voters' trust and remain credible during its mandate. The credibility is based on the government's ability to keep election promises which include keeping the exchange rate fixed, avoiding the default, providing some minimum level of public goods and maintaining reasonable tax rate. When revenues raised from taxation are not enough to fund government's expenditures and to repay the debt from the last period, the government borrows from the international market. A growing need for external financing increases country's risk and raises its external and domestic lending interest rates. Through their negative impact on domestic investments¹, mounting interest rates reduce the gross domestic product and the income of households.

Higher level of sovereign debt-to-GDP ratio reduces income and decreases the utility of households and firms which in turn lowers government (re)election probability. When the government identifies potential (re)election probability losses, it compares net utility loss of lower investments and income as a consequence of higher budget deficit on one side, and credibility and import losses following the decision to default on the other side.

The model dynamics suggests that policy makers decide to default when the probability of re-election is higher in case of default than in case of maintaining credibility. The model sets the basis for the above mentioned dynamics and allows for comparative statics exercises.

¹ Firms have to borrow to pay for inputs; increases in the interest rate make their effective cost higher and reduce their demand (Neumeyer & Perri, 2004).

2. STANDING ON SHOULDERS OF GIANTS

Since it is hard to cover plentiful sovereign default literature, in this section we will try to provide a non-exhaustive review of previous research findings which inspired and encouraged us to explore the phenomenon of default. After the standard literature review we will describe our assumptions, stylized facts and model setting in the context of previous sovereign debt and default literature.

2.1. Literature Review – Stylized Facts, Assumptions and Conclusions

Most of the examined literature base is built within dynamic general equilibrium models. All these papers had the same idea – built a model based on realistic assumptions which successfully explains stylized facts about the main macroeconomic variables around the default. Due to the limited space, we will focus our literature review on decisive assumptions and success in explaining stylized facts.

While trying to explain how default occurs in equilibrium, Eaton & Gersovitz (1981), among other assumptions², assume that a defaulting country faces a permanent embargo on all future loans³. They conclude that there is a certain amount of sovereign debt which is sustainable, and credit market exclusion encourages debt repayment. They empirically proved most of their theoretical findings.

Similarly, Aguiar & Gopinath (2004) assume that if the government refuses to pay any part of the debt, the country defaults and is punished with financial autarky for a (exogenously set) period of time. While they emphasize the importance of permanent⁴ shocks to income process, the predictions remain under those obtained in the data⁵ when simulating the model for Argentina.

D'Erasmus (2007) builds his model on the already known assumptions adding another cost of default - a proportional output loss.. By introducing the combination of government reputation with endogenous periods of exclusion and debt renegotiation, he managed to produce "*a debt to output ratio at least 100% higher than in previous models*" when the model was calibrated to fit the data for Argentina. Moreover, his model successfully generated the main business cycle regularities of emerging economies.

Arellano (2008) added an assumption that the output cost of default is larger in booms than in recessions. Arellano (2008) showed that default incentives are higher when the economy has a large debt position (matches to this empirical fact) and that default happens in recessions (in contrast to some findings, default is more attractive in recessions). Her model successfully replicates stylized facts, or more precisely, business statistics in Argentina.

More recent contributions to endogenous default of sovereign debt can be found in Mendoza & Z. Yue (2011), Moussa (2011), Andreasen, Sandleris, & Van der Ghote (2013), Asonuma (2014). All these authors add some unique assumption depending on the selected feature of the economy that they wish to explain. Mendoza & Z. Yue (2011) provide a model setting in

² Indefinite alternation of periods of high and low income, outstanding debt increases the benefits of default, lenders are competitive and risk neutral.

³ Many authors build their models of sovereign debt and defaults on a similar assumption (e.g. Amador (2002) and Kovrijnykh & Szentes (2007)).

⁴ "*Trend shocks have a greater impact on the propensity to default*" Aguiar & Gopinath (2004)..

⁵ However, the predicted sign of the correlations of income, net exports, and the interest rate are in line with empirical findings.

which the quantitative dynamics of output and sovereign default are determined jointly (unlike exogenous output dynamics in most sovereign debt and default papers) and influence each other. When calibrated for Argentina, their model does well at explaining three stylized facts of foreign defaults. However, debt to GDP ratio in equilibrium (default) still can't pass the reality test.

Moussa (2011) and Asonuma (2014) deal with the connection between exchange rate regimes and movements, and default. Authors in both papers assume that devaluation increases the external debt burden and positively affects the probability of default. While Moussa (2011) expands his assumptions with sticky nominal wages and evaluates the welfare impact of abandoning a fixed exchange rate regime in the wake of a sovereign default crisis, Asonuma (2014) tries to replicate “*the empirical link between the real exchange rate depreciation and default risk (default decision)*”. Their models, calibrated for Argentina, offer acceptable explanation of the observed patterns in the data.

2.2. Endogenous Default Setting

Similar to Cuadra, Sanchez, & Sapriza (2010), the government is fully rational and aims to maximize its probability to be elected by maximizing the utility of consumers and producers). In every point of time, the government decides whether to repay its accumulated sovereign debt or to default on it. The decision is governed by comparison of net utility loss of these alternatives.

Our construction of a model in which the government has the choice to either tax households' consumption or to borrow from abroad as to finance required amount of public goods follows Aizenman, Gavin, & Hausmann (2000) and Cuadra, Sanchez, & Sapriza (2010)⁶. The markets are incomplete such as in Cuadra, Sanchez, & Sapriza (2010) and Aguiar & Gopinath (2004) in a sense that the only asset available to the government is a one period non-contingent bond⁷. We do not assume proportional output lost in the case of the default as D'Erasmus (2007) did since “*growth rates in the post-default period are never significantly lower than in normal times*” (Levy-Yeyati & Panizza, 2006).

When the government chooses to default, we assume, as Arellano (2008) did, that the debt is never paid back. However, unlike Arellano (2008), we assume that default is rather a policy choice than an inevitable consequence of hard credit constraints, since in a number of occasions Panizza, et al., (2009) and Yong Kyun (2013) write in terms of government's decision to default. Therefore, even if we are aware of it, we ignore other string of literature which indicates that most countries were credit constrained (for example Eaton & Gersovitz (1981) and Aizenman, Gavin, & Hausmann (2000)).

Secondly, we assume that government refuses gradual depreciation prior to default. In other words, we rule out the possibility of devaluation before default. This obviously contradicts assumptions and conclusions stated in Moussa (2011) and Asonuma (2014), as well as empirical evidence presented in Reinhart (2002) and Jahjah & Yue (2004). However, it is in line with conclusions stated in Popov & Wiczer (2010) We are not ignoring the possibility

⁶ Literature review does not cover these two papers since their goals differ from ours. However, they work with similar model setting and assumptions.

⁷ “*The government could easily obtain a constant tax rate if it traded state-contingent debt, that is, promises to the private sector that were conditional on the realization of future uncertainty. In reality, however, governments do not customarily issue state-contingent debt, perhaps because the involved contingencies are hard to describe and verify. Instead, governments almost exclusively issue non-contingent debt, or bonds whose payoff is independent of the realization of uncertainty.*” (Angeletos, 2002).

that currency crises sometimes triggers a default; however, our sample selection is based on the assumption that default triggers currency crises.

To be more precise, we were asking ourselves: why would a government stick to fixed and overrated exchange arrangements, beside already identified adverse⁸ effects of devaluation on foreign currency denominated sovereign debt and debt intolerance⁹. We utilised Cruces and Trebesch (2014 update) database, and selected countries which had (some kind of) fixed exchange rate regime according to Reinhart & Rogoff (2002) and Bubula & Otker-Robe (2002) and which have defaulted before currency crises occurred. Thus, our assumption does not diminish the validity of our conclusions for these countries.

Table 1: Sample selection

Country	Year of default	Reinhart & Rogoff (2002) <i>The Modern History of Exchange Rate Arrangements: A Reinterpretation</i>	Bubula & Otker-Robe (2002) <i>The Evolution of Exchange Rate Regimes Since 1990 Evidence from De Facto Policies</i>
Argentina	2001.	1992–2001 Currency Board/Peg to US Dollar	1991-2001 Currency board
Ecuador	1998/99.	1993-1997 De facto crawling band around US Dollar/Dual Markets	1994-1997 Forward looking crawling band
Honduras	1989.	1985-1990 De facto crawling band around US Dollar/Parallel Market	NA
Ukraine	1998.	1991-1996 Freely falling/Dual Markets 1996-1998 Dual markets ¹⁰	1996-1998 pegged within a horizontal band
Russian Federation	1998.	1996-1998 Pre announced crawling band around \$US	1995-1998 Forward looking crawling peg

Coming back to our central question, we felt that our answer lies somewhere between economic and political factors, or, as Cuadra & Saprizza (2006) put it: "Political economy factors are generally considered important determinants of interest rate spreads". Since a higher interest rate spread reflects increased default risk, political economy factors could be a relevant determinant of the default. What if the government sticks to promised policies as to increase its probability to be elected? In that case, if domestic consumers prefer imported to domestic goods, the government sticks with promised (fixed) exchange rate as long as possible. When the utility loss from non-existing imports and credibility loss from violation of election promises falls short of the utility loss from lower current investments due to interest rates hike, government chooses to default.

Since, in line with most of the literature presented here, we assume that after the default country experiences "autarky", the government can easily allow currency depreciation. In that moment, consumers are "doomed" to domestic goods.

⁸ Adverse means that devaluation increases domestic currency sovereign debt.

⁹ Reinhart, Rogoff & Savastano (2003) define debt intolerance as the inability of emerging markets to manage levels of external debt that are manageable for advanced countries.

¹⁰ In a dual exchange rate system, there are both fixed and floating exchange rates in the market. The fixed rate is only applied to certain segments of the market, such as "essential" imports and exports and/or current account transactions. In the meantime, the price of capital account transactions is determined by a market driven exchange rate (Reinhart & Rogoff, 2002).

We do not consider the costs of the exclusion from credit markets even if it is largely recognized cost in the literature¹¹. We believe that these costs are marginal in our static model since one year of capital markets exclusion could be a bearable cost. On the other hand, exclusion from capital markets which lasts for more than few years in dynamic models could drastically increase credit market related default costs.

3. THE MODEL

3.1. The world

The world consists of four types of participants: consumers, government and producers within the country, and foreign creditors outside the country. All the participants are completely rationally motivated. Time elapses in discrete points ($t \in \{0, 1, 2, \dots\}$).

Producers produce one homogeneous good, which is being sold on both domestic and foreign markets. Although companies' goals are of economic nature only (in our case, larger sales volume), they also take part in political sphere of the county by lobbying, publicly and financially supporting specific politician or party etc., and can therefore indirectly influence the outcome of the elections. The important thing is that company's support depends solely on their economic well-being (i.e. sales).

Consumers use their income to buy goods on both domestic and foreign markets. The only source of income are the wages they. Living in an open economy, people's preferences are somewhat inclined towards consumption of foreign goods. Consumers' political support depends on two things: their economic well-being (i.e. the amount of domestic and foreign goods they are able to buy with their income) and their political satisfaction, which comes from the fulfilment of policies promised by politicians. These policies include tax rate, government expenditure, and terms of international trade (i.e. availability and price of foreign goods) determination.

Politicians (government) are being elected by consumers at general elections. Their only goal is (re)election, so they chose policies in order to optimize their probability of being (re)elected. When in power, in the process of policy selection, politicians are to some point constrained by their political promises considering economic policies announced to people in the pre-election campaign. Those three elements (consumers and producers economic well-being, and political satisfaction), together with the relative importance politicians assign to each of them, completely determine the probability of (re)election and consequently the optimal policy.

Foreign creditors lend their funds to the government. The price of new debt (interest rate) depends on three variables: global capital market conditions represented by world zero-risk interest rate, country's indebtedness (sovereign debt to GDP ratio) and expected future debt burden (budget deficit to GDP ratio, which is a sign of irresponsible borrowing).

The core of our study are countries where general public preferences towards stronger currency (i.e. cheaper imports) combined with corresponding pre-election promises,

¹¹ Generally, authors have, as Sandleris (2008) puts it, "...suggested explanations which fall into two categories: sanctions and reputation." Support for trade and credit sanctions (reputation) explanations includes empirical findings of Richmond & Dias (2009), Sandleris & de Negocis (2012), Rose (2001) and Rose & Spiegel (2004) and Sandleris (2008). On the other hand, there are few papers which contradict those findings such as the evidence stated in Levy-Yeyati & Panizza (2006), Panizza, et al. (2009) and in Martinez & Sandleris (2011).

overcome economic reasons in favour of gradual exchange rate devaluation. As it will be clearer later on, this is characterized by relation $\frac{\partial P}{\partial E_t} < 0$ (where P stands for (re)election probability) coupled with foreign exchange market depreciation pressures. Our goal is to study how and when these assumptions lead governments' decision to keep exchange rate fixed all the way until the eventual default. Default is then followed by currency devaluation/depreciation. In other words, we are trying to find reasonable assumptions within a rational behaviour framework that lead to worst case scenario (both default and sharp depreciation) instead of always open possibility of gradual depreciation.

Additionally, we assume that crowding-out effect occurs, and is a strong one. Specifically, additional government expenditure raises total product in the first step, but also results in larger budget deficits and interest rate growth, which in turn decreases investment level enough to make the net impact on GDP negative.

3.2. Connections between the participants

1. The main equation in the model is politician's *probability of (re)election*:

$$P(\text{reelection}) = \alpha * U_C * V + (1 - \alpha) * U_P \quad (1)$$

or more precisely:

$$P(\text{reelection}; E_t, D_t, \tau_t, G_t) = [\alpha * U_C(\tau_t, w, Y_t, \beta, D_t, E_t) * V(\tau_t, G_t, E_t, D_t) + (1 - \alpha) * U_P(\tau_t, w, Y_t, \beta, D_t, w^*, \beta^*, Y_t^*, E_t)] \quad (1')$$

Here $\alpha \in [0,1]$ represents importance (weight) given to consumers¹² total utility when calculating (re)election probabilities. U stands for consumers (U_C) and producers (U_P) utility functions; V is government political credibility function in the eyes of consumers

Consumers' utility function consists of the part that arises from the consumption of domestic goods $((1 - \beta)wY_t)$ and the part that arises from the consumption of foreign goods $(\beta \frac{wY_t}{E_t})$, both subtracted by current consumption tax rate (τ_t);

$$U_C(\tau_t, w, Y_t, \beta, D_t, E_t) = (1 - \tau_t)[(1 - \beta)wY_t + (1 - D_t)\beta \frac{wY_t}{E_t}] \quad (1.1)$$

Here w denotes wages-to-GDP ratio, Y_t is real GDP, β stands for domestic propensity to import. $D_t \in \{0,1\}$ is binomial variable: if a country defaults than it takes the value of 1, and 0 otherwise. E_t stands for real exchange rate (direct quotation- real value of foreign goods in terms of domestic goods).¹³

Government's credibility depends on whether the promised (pre-election) policies are fulfilled:

$$V(E_t, D_t, G_t, \tau_t) = \gamma_1 I(E_t = \bar{E}, D_t = 0) + \gamma_2 I(\tau_t \leq \bar{\tau}) + \gamma_3 I(G_t \geq \bar{G}) \quad (1.2)$$

where $I("A")$ stands for truth function (1 if "A" is true; 0 otherwise). $(\bar{E}, D_t = 0, \bar{\tau}, \bar{G})$ is the vector of promised policies, while γ_i ($i = 1,2,3$) represent weights given the relative importance of policies in the eyes of consumers; $\gamma_1 + \gamma_2 + \gamma_3 = 1$.

¹² Relative to producers.

¹³ In the case of default ($D_t = 1$), there is no international trade.

In the pre-election campaign, politicians promise to keep the terms of international trade unchanged ($E_t = \bar{E}, D_t = 0$), taxes below some maximal level ($\tau_t \leq \bar{\tau}$) and government expenditure (schools, police, infrastructure etc.) above some minimal level ($G_t \geq \bar{G}$).

Producers' utility function depends solely on its economic prosperity- amount of goods sold on domestic and foreign market:

$$U_C(\tau_t, w, Y_t, \beta, D_t, w^*, \beta^*, Y_t^*, E_t) = (1 - \tau_t)(1 - \beta)wY_t + (1 - D_t)\beta^*E_tw^*Y_t^* \quad (1.3)$$

where w^* represents foreign wages-to-GDP ratio, β^* is foreign propensity to import (domestic propensity to export), and Y_t^* stands for foreign real GDP.¹⁴

2. The only instrument government can directly control to influence the state of economy is the *national budget*. Consumption tax (τ_t) and new debt (E_tB_t) being the only revenue (LHS), and government expenditure (G_t) and old debt repayment (including interest payment, $E_t(1 + q_{t-1})B_{t-1}$) being the only public expenditure (RHS), budget equation is given by:

$$\tau_t C_t + E_t B_t = G_t + E_t(1 + q_{t-1})B_{t-1} \quad (2)$$

where q_{t-1} is real interest rate at time $t-1$ and C_t stands for domestic consumption at time t . C_t is generally given by: $C_t = (1 - (1 - D_t)\beta)wY_t + (1 - D_t)\beta \frac{wY_t}{E_t}$ ¹⁵.

Rearranging (2) we get:

$$B_t = (1 + q_{t-1})B_{t-1} + \frac{G_t - \tau_t C_t}{E_t} \quad (2')$$

It is important to realize that, in case of default, budget equation (2') transforms into:

$$G_t = \tau C_t \quad (2'')$$

Acknowledging, from (2.1), that C_t is a function of Y_t , and inserting it into (2'') or (2''') we can see that the government has to take care of period's t final total product Y_t when planning the budget (i.e. variables G_t, τ_t, B_t) on the beginning of period t .

3. *Total product* (GDP) function at time t is given by:

$$Y_t = C_t + G_t + I_t + (1 - D_t)(Ex_t - Im_t) \quad (3)$$

Here $Im_t = \beta \frac{wY_t}{E_t}$ represents import at time t , and $Ex_t = \beta^* E_t w^* Y_t^*$ represents export at time t .

Investment function at time t is given by:

$$I_t = \delta Y_t - \varepsilon q_t \quad (3.1)$$

where δ stands for elasticity of investments on total product, while ε determines elasticity of investments on interest rate changes.

4. *Credit conditions* on foreign debt market are given by:

$$q_t = q_t^* + \rho_1 \frac{(1 + q_{t-1})B_{t-1}}{E(Y_t)/E_t} + \rho_2 \frac{B_t - (1 + q_{t-1})B_{t-1}}{E(Y_t)/E_t} \quad (4)$$

where $\rho_1, \rho_2 > 0$ stand for responsiveness of sovereign debt interest rate to current debt-to-expected GDP ratio ($\frac{(1+q_{t-1})B_{t-1}}{E(Y_t)/E_t}$ - current indebtedness indicator) and to net debt inflow-to-

¹⁴ See 12.

¹⁵ See 12.

expected GDP ratio $\left(\frac{B_t - (1+q_{t-1})B_{t-1}}{E(Y_t)/E_t}\right)$ - indicator of future debt-to-GDP path; long-term irresponsibility of borrowing). $E(Y_t)/E_t$ is county's real GDP that foreign market expects at time t .

The government can issue one-period bonds only. The whole debt burden from period $t-1$ has to be fully paid at period t , or else the country is considered defaulted (there is no partial payment possibility). In the second case, there is no new lending and the corresponding interest rate is unchanged ($q_t = q_{t-1}$).

3.3. Model dynamics

Confronted with existing foreign debt burden, promises given during pre-election campaign, and consumers' and producers' preferences, government tries to maximize its probability of (re)election in discrete time fashion.

0. At every point in time t , government is fully aware of values of fixed variables representing permanent features of the economy $\{w, \beta, \delta, \varepsilon\}$ and domestic preferences towards different policies $\{\gamma_1, \gamma_2, \gamma_3\}$, current debt characteristics $\{q_{t-1}, B_{t-1}\}$, and economic properties of the outside world $\{w^*, \beta^*, Y_t^*\}$.

In the political spectrum, both government and voters (consumers) are aware of previously promised vector of policies $(\bar{E}, D_t = 0, \bar{\tau}, \bar{G})$.

1. Since the government is rational and has access to perfect information about the state of the economy¹⁶, given q_t, G_t, E_t , it can precisely calculate the equilibrium total product Y_t using equations (3), (3.1) and definitions of C_t, Im_t and Ex_t .

Thus, knowing the mechanisms of foreign debt market (equation (4)), the government can precisely calculate the equilibrium total product Y_t , given τ_t, G_t, E_t (and, of course, D_t).¹⁷

The higher is the level of government expenditure, the higher is the total product of the economy. On the other hand, higher level of government expenditure leads to higher budget deficit, which implies a bigger interest rate and consequently lower investment level and lower total product.

2. Knowing all of the above, the chosen set of policies (E_t, D_t, τ_t, G_t) uniquely determines the probability of (re)election P in (1). Thus, a rational government chooses the policy levels consistent with the highest attainable P .

To sum up: government has perfect information about economic and social conditions, foreign debt market functionalities and, obviously, its promises made to citizens (step 0). Aware of given constraints (national budget equation, deficit-interest rate link etc.) and all the consequences of alternative policies, government chooses a vector of policies (step 1) in order to maximize the probability of (re)election (step 2).

¹⁶ Unlike foreign creditors who have to estimate the outcome- that is where $E(Y_t)$ in (4) comes from.

¹⁷ Why do we call it "equilibrium total product"? The reason is that this product is the equilibrium solution of a system:

- 1.1. Given the total product Y_t , government choses a vector of economic policies (E_t, D_t, τ_t, G_t) . Having chosen the policies, new external debt level B_t is uniquely determined using (2') or (2''), depending on the value of $D_t \in \{0, 1\}$. As already mentioned, one should notice that the income side of national budget equation depends on the value of Y_t (precisely, $C_t = f(Y_t)$).
- 1.2. Given the level of previous debt burden and interest rate $(1 + q_{t-1})B_{t-1}$, foreign debt market determines the new interest rate value q_t for every given pair of coefficients ρ_1, ρ_2 and new debt level B_t . When doing so, foreign creditors use the estimation of this period total product $E(Y_t)$.
- 1.3. Using (3.1), newly calculated interest rate q_t determines the new level of investment I_t , which in turn determines the new level of total product Y_t (back to step 1.1.).

3.4. Calculating the equilibrium total product and optimal (re)election probability

First of all, we recall that our goal is to study policies of the government which faces incentives to keep the exchange rate fixed. Specifically, we assume $\frac{\partial P}{\partial E_t} < 0$ ¹⁸ coupled with foreign exchange market depreciation pressures, which make exchange rate fall impossible. That is why governments keep exchange rates fixed- it maximizes their probability of (re)election within all feasible values of E_t (current value of E_t or higher).

Another assumption we have to recall in order to rationalize governments' behaviour is the existence of crowding-out effect. More specifically, we assume $\frac{\partial Y}{\partial G_t} < 0$ ¹⁹, which, as it will soon be obvious from (7), is equivalent to $\frac{\varepsilon\rho_2}{E(Y_t)} > 1$. Last thing we conclude, examining (1), is implication $(\frac{\partial Y}{\partial G_t} < 0) \rightarrow (\frac{\partial P}{\partial G_t} < 0)$, i.e. $(\frac{\varepsilon\rho_2}{E(Y_t)} > 1) \rightarrow (\frac{\partial P}{\partial G_t} < 0)$.

No default case

First, let us find equilibrium total product when default does not occur ($D_t = 0$).

We start by inserting defining equations for C_t and Im_t , and (3.1) into (3), so we get:

$$Y_t = (1 - \beta)wY_t + \beta \frac{wY_t}{E_t} + G_t + \delta Y_t - \varepsilon q_t + (Ex_t - \beta \frac{wY_t}{E_t})$$

Solving for Y_t gives:

$$Y_t = \frac{G_t - \varepsilon q_t + Ex_t}{1 - \delta - (1 - \beta)w} \quad (5)$$

On the other hand, inserting (2') into (4), we obtain:

$$q_t = Q + \rho_2 \frac{G_t - \tau_t C_t}{E(Y_t)} \quad (6)$$

where $Q = q_t^* + \rho_1 \frac{(1+q_{t-1})B_{t-1}}{E(Y_t)/E_t}$ is fixed for fixed E_t .

Combining the defining equation for C_t with (6), and imbedding it into (5), after simple algebraic manipulations, we find:

$$Y_t = \frac{G_t - \varepsilon Q - \varepsilon\rho_2 \frac{G_t}{E(Y_t)} + Ex_t}{1 - \delta - \left[\left(1 + \frac{\varepsilon\rho_2}{E(Y_t)} \tau_t \right) (1 - \beta) + \frac{\varepsilon\rho_2}{E(Y_t)} \frac{\tau_t \beta}{E_t} \right] w} \quad (7)$$

It is now easy to see that the probability of (re)election P for chosen vector of policies $(E_t, D_t = 0, \tau_t, G_t)$ is uniquely given by (1)²¹, where Y_t is calculated from (7):

$$P(\text{reelection}; E_t, D_t = 0, \tau_t, G_t) = \left[\alpha * (1 - \tau_t) \left(1 - \beta + \frac{\beta}{E_t} \right) wY_t * \right. \\ \left. * V(\tau_t, G_t, E_t, D_t = 0) + (1 - \alpha) * [(1 - \tau_t)(1 - \beta)wY_t + Ex_t] \right] \quad (8)$$

Among all possible vectors of policies where default does not occur, we set $(E_N, D_N = 0, \tau_N, G_N)$ to be the one that maximize the (re)election probability P .²²

Default case

¹⁸ Wherever the derivation exists.

¹⁹ See 17.

²⁰ Bolded variables in (7) are those under direct control of the government. E_t remains fixed, as explained before.

²¹ Using defining equations (1.1), (1.2) and (1.3).

²² As discussed before, $E_N = \bar{E}$.

Now let us consider the case of default ($D_t = 1$). As explained before, in this case there is no international trade and interest rate remains the same as in previous period ($q_t = q_{t-1}$).

Same as in the first case, we start by inserting defining equations for C_t ($C_t = wY_t$ when default occurs), (3.1) into (3). Now, endorsing equation (2''), and using it to substitute the term G_t in (3), we can solve the newly derived equation for Y_t to find:

$$Y_t = \frac{\varepsilon q_{t-1}}{(1 + \tau_t)w + \delta - 1} \quad (9)$$

Using (1), it is now easy to see that that the (re)election probability P for chosen vector of policies ($E_t, D_t = 1, \tau_t, G_t$) is uniquely given by:

$$P(\text{reelection}; E_t, D_t = 0, \tau_t, G_t) = \frac{(1 - \tau_t) \frac{w\varepsilon q_{t-1}}{(1 + \tau_t)w + \delta - 1} * [\alpha(\gamma_2 I(\tau_t \leq \bar{\tau}) + \gamma_3 I(G_t \geq \bar{G})) + 1 - \alpha]}{(1 - \tau_t) \frac{w\varepsilon q_{t-1}}{(1 + \tau_t)w + \delta - 1} * [\alpha(\gamma_2 I(\tau_t \leq \bar{\tau}) + \gamma_3 I(G_t \geq \bar{G})) + 1 - \alpha]} \quad (10)$$

Among all possible vectors of policies where default does occur, we set ($E_Y, D_Y = 0, \tau_Y, G_Y$) to be the one the one that maximizes the probability of (re)election P .²³

3.5. Optimal policy

Having derived explicit formulas which connect the chosen vector of policies with equilibrium total product and (re)election probability, it is possible to determine which one of all feasible vectors of policies maximizes (re)election probability P . In terms of previous section, we conclude that defaulting on foreign debt is optimal when $P(\text{reelection}; E_Y, D_Y = 0, \tau_Y, G_Y) > P(\text{reelection}; E_N, D_N = 0, \tau_N, G_N)$.

Other than assumed relations $\frac{\partial P}{\partial E_t} < 0$ and $\frac{\partial P}{\partial G_t} < 0$, it is useful to detect as many properties of optimal policy as possible. In that light, we start with the case of $D_t = 0$ and observe that, since $\frac{\partial P}{\partial G_t} < 0$ ²⁴, the optimal policy is attained for $G_t \in \{0, \bar{G}\}$ (functions P and V have discontinuity at $G_t = \bar{G}$). The sign of connection of P and τ_t cannot be easily determined a priori.

In the case of $D_t = 1$, we first use (2'') to find the tax rate $\tilde{\tau}$ associated with $G_t = \bar{G}$ ($\bar{G} = \tilde{\tau}C_t = \tilde{\tau}wY_t$). After that, we can use (9) and (10) to conclude that $\frac{\partial P}{\partial \tau_t} < 0$ ²⁵. Using this, and the fact that function V is a decreasing function of τ_t with discontinuities at $\{\bar{\tau}, \tilde{\tau}\}$, we conclude that optimal policy is attained for $\tau_t \in \{0, \bar{\tau}, \tilde{\tau}\}$.

Finally, in the case of default, it is clear from equations (9) and (10) that exchange rate E_t does not enter the equation of this period probability of (re)election. Thus in this case a rational government stops all efforts aimed to keep the exchange rate fixed. This leads to sudden and sharp exchange rate depreciation.²⁶ The absence of the term E_t in determining the probability of (re)election P following a default is important to our understanding of why exchange rate depreciation follows immediately after the default.

²³ See 21.

²⁴ See 17.

²⁵ See 17.

²⁶ We assumed that our country deals with foreign market depreciation pressures, and current exchange rate needs to be defended in order to keep it fixed.

3.6. Constructing a case where it is rational to default and then depreciate

In order to prove that it is possible to rationally explain government's decision to default and to devalue immediately after, rather than presenting a fairly complicated general calculation, we give an example of such a setting. It is very important to notice that coefficients used in our example are set to more or less reasonable and commonly used values.²⁷

Another important remark is that the only purpose of our example is to offer a proof of the existence of a solution where defaulting is the most rational solution. Therefore, our example does not exhaust all possible solutions. Regarding that, the existence of other (better justifiable) settings is an additional option.

$$\begin{array}{llll} \delta = 0.7 & \gamma_2 = 0.3 & Ex_t = 36.2\% E(Y_t) & E_t = 1 \\ w = 0.8 & \gamma_3 = 0.2 & q_{t-1} = 20 & \\ \alpha = 0.7 & \bar{\tau} = 0.3 & Q = 6.6 & \\ \beta = 0.55 & \tilde{\tau} = 0.1^{28} & \varepsilon = 0.065 E(Y_t) & \\ \gamma_1 = 0.5 & \bar{G} = 8\% E(Y_t) & \frac{\varepsilon \rho_2}{E(Y_t)} = 1.1 > 1^{29} & \end{array}$$

Let us first consider the case $D_t = 1$. Because $\tilde{\tau} < \bar{\tau}$ and function P is a decreasing function of τ_t , we conclude that $\tau_Y \in \{0, \tilde{\tau}\}$. Using (9) and (10) we calculate that $Y_t(\tau_t = \tilde{\tau}) = \frac{\varepsilon q_{t-1}}{(1+\tilde{\tau})w+\delta-1} = \frac{1.3}{1.1*0.8+0.7-1} E(Y_t) = 2.24E(Y_t)$ and $P(\tau_t = \tilde{\tau}) = 1.049E(Y_t)$. Similarly, $P(\tau_t = 0) = 0.915E(Y_t)$. We can now conclude that $P(\text{reelection}; E_Y, D_Y = 1, \tau_Y, G_Y) = 2.24E(Y_t)$.

Alternatively, if $D_t = 0$, we undertake some subtle bounding in (7) to obtain:

$$Y_t(G_t = \bar{G}) = \frac{\bar{G} - \varepsilon Q - \varepsilon \rho_2 \frac{\bar{G}}{E(Y_t)} + Ex_t}{1 - \delta - \left[\left(1 + \frac{\varepsilon \rho_2}{E(Y_t)} \tau_t \right) (1 - \beta) + \frac{\varepsilon \rho_2}{E(Y_t)} \frac{\tau_t \beta}{E_t} \right] w} = \frac{0.06}{[(1+1.1\tau_t)0.45+1.1*0.55\tau_t]0.8+0.7-1} E(Y_t) = \frac{0.06}{[1.1\tau_t+0.45]0.8-0.3} E(Y_t) \leq \frac{0.06}{0.45*0.8-0.3} E(Y_t) = E(Y_t).$$

Consequently: $P(G_t = \bar{G}) = \alpha * U_P * V + (1 - \alpha) * U_C \leq \alpha * U_P + (1 - \alpha) * U_C = 0.777E(Y_t)$. Similarly, $P(G_t = 0) \leq P(G_t = \bar{G}) * \frac{0.068}{0.06} = 0.881 E(Y_t)$. We can now conclude that $P(\text{reelection}; E_N, D_N = 0, \tau_N, G_N) \leq 0.881 E(Y_t)$.

Thus we conclude $P(\text{reelection}; E_Y, D_Y = 1, \tau_Y, G_Y) > P(\text{reelection}; E_N, D_N = 0, \tau_N, G_N)$, and the existence of a setting in which defaulting on sovereign debt is the optimal policy is shown.

4. Fitting the Model to Data

Our model suggests that the government's decision to default is rational and can be explained with credibility considerations. We now confront our assumptions and conclusions with the data and check how well it mimics the reality. Since we have already explained our sample selection we will start with the reality check of our model's assumptions and predictions by comparing them to data observed in Argentina, Ecuador, Honduras, Russian Federation and Ukraine immediately before and after the default.

²⁷ One will find useful to reread our discussion in the previous section to justify the reasonability of some of our less obvious choices.

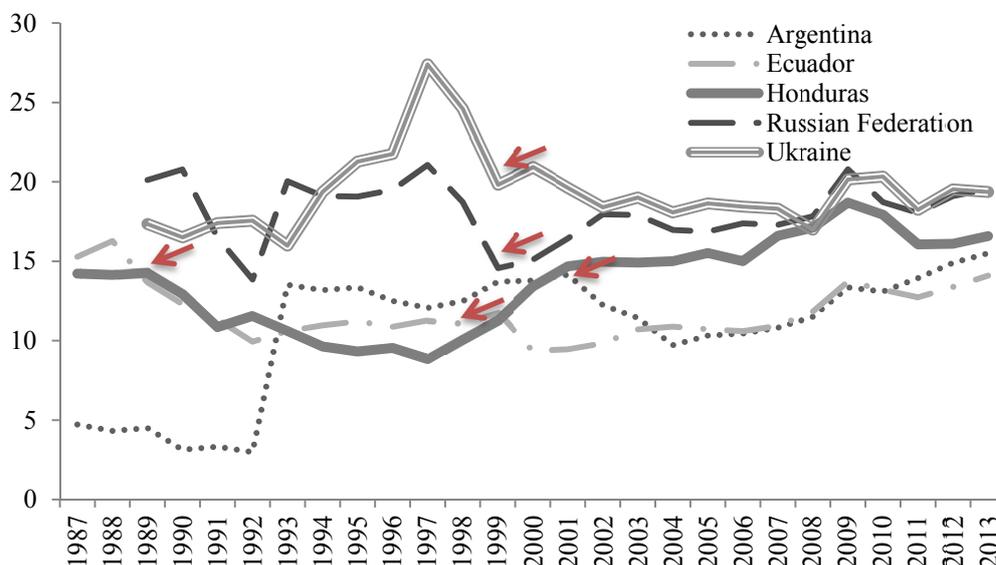
²⁸ Associated with \bar{G} in the case of default ($D_t = 1$).

²⁹ Crowding-out condition.

Let us start with "domestic package of policies" from our credibility function. Basically, what we are saying is: if our assumption matches the reality, governments will be reluctant to increase consumption tax rates (we equate them to value added tax rate) and lower government expenditures after the default episode. Regarding the taxes, data available at CIAT (2014) and in Pogorletskiy & Söllner (2002) and Bird (2006) indicate a stability of tax rates. While taxes in our Latin American countries certainly remained unchanged few years prior and after the default according to CIAT (2014) data, we cannot claim the same for Russian Federation and Ukraine due to the lack of reliable evidence. For example, in Ukraine, Russian Federation and Argentina, value added tax rates (by which we can approximate our "reasonable" tax rate) amount to presumed 20% in our example (CIAT, 2014, Pogorletskiy & Söllner, 2002 and Bird, 2006). Average tax rate in Ecuador and Honduras are significantly lower than our model suggests (from 1977-2014 these tax rates amount to 9.7% and 8.2% on average, respectively).

Government consumption should either stay unchanged, or increase after the default (since the government chooses to default rather than to increase taxes and to decrease its purchases). As it can be seen from the following diagram, except for Argentina and Honduras, other countries reach the lowest point of the government consumption to GDP ratio exactly in the year of default. This is in line with our assumption that when faced with the need to lower government expenditures (to prevent interest rate hikes) our government chooses to default in order to maintain some "minimum level" of public goods. Average government consumption to GDP ratio in our countries exceeds 8% assumed in our example, and lingers around 15%. However, at the time of default government consumption to GDP ratio in Honduras was around 11%, which is slightly above presumed value.

Figure 1: Government Consumption to GDP ratio (1987-2013)



Source: World Bank

"Foreign package of policies" in our credibility function assumes government's unwillingness to devalue and to default. Default is generally seen as unfavourable outcome and we think that this feature of our credibility function needs no further explanation. However, our assumption of government's reluctance to devalue needs an explanation since it is crucial for understanding why governments are unwilling to devalue prior to default.

We could just assume some utility function form which suggests that consumers prefer foreign goods, and in that case we would easily confirm our hypothesis. However, this would be hardly verifiable. Instead, we assumed that our consumers largely rely on imported goods. This assumption is embodied in our β coefficient, i.e. we assume that $\beta \geq 0.5$. We tried to approximate β for our countries, and the results are presented in the following table. While Argentina does not satisfy this criterion, Ecuador and Russian Federation are close. Ukraine and Honduras are definitely above our threshold. In our example $\beta = 0.55$, which is the average of our sample. We are aware that here presented estimates of consumer's propensity to imported goods overrate its real value since consumers are not the only demanders of foreign goods. However, we believe that they create the majority of demand.

Table 2: Import/Export to GDP ratio

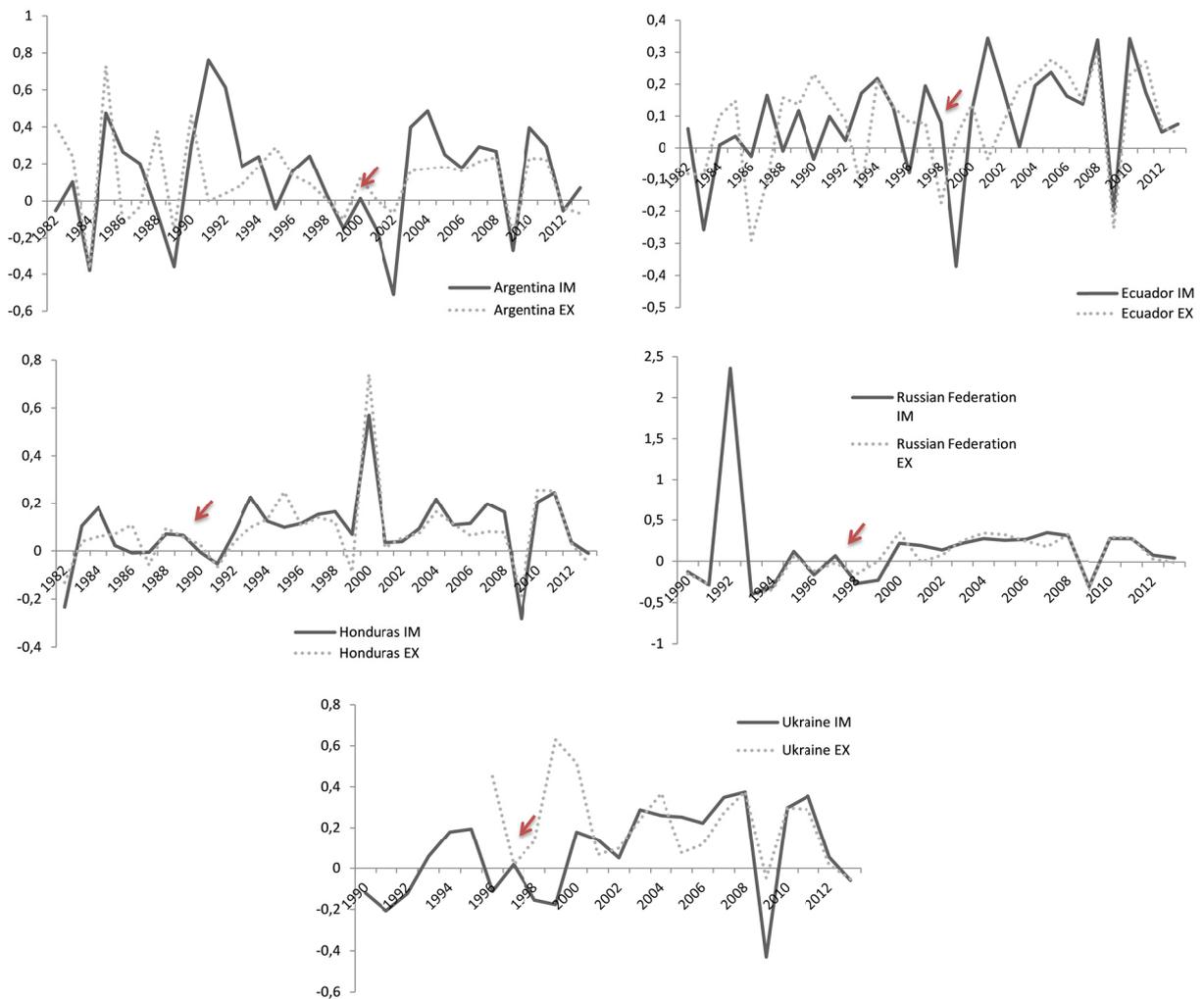
Country	Year	Household final consumption expenditure [%GDP]	Imports of goods and services [%GDP]	Beta	Exports of goods and services [%GDP]
1	2	3	4	6=4/3	7
Argentina	Average 2001-2013	66.45	14.23	0.21	0.18
Ecuador	Average 1998/99-2013	66.11	28.76	0.44	0.28
Honduras	Average 1989-2013	71.79	59.89	0.83	0.49
Ukraine	Average 1998-2013	57.81	46.35	0.80	0.5
Russian Federation	Average 1998-2013	50.47	22.73	0.45	0.31
Average				0.55	0.35

Source: World Bank, authors' calculations

On the other hand, we assume that producers can satisfy foreign demand. In our model we assumed that export to GDP share equals 0.35 since it is the average value of export to GDP ratios in our sample countries.

Additionally, we assume that after the default country experiences “autarky”. In this case we should see large import drop at the time of the default. Figure 2 verifies our assumption in most cases. Exports should have the same tendency, and in most cases it really does (see Figure 2).

Figure 2: Imports of goods and services (current US\$)

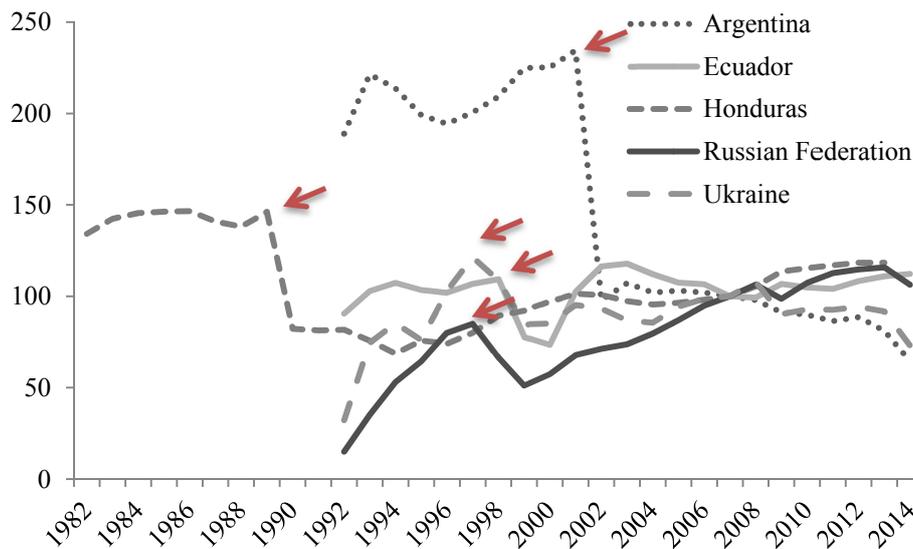


*Note: Because of large export swings in Ukraine from 1990-1996, which we cannot explain, we do not show the data in the diagram.

Source: World Bank

Now it is perfectly clear why governments decide to devaluate after the default. Since import has already been phased out, consumers have already switched to domestic substitutes and do not require stable and overrated exchange rate. We can confirm our conclusion by looking at the Figure 3.

Figure 3: Real effective exchange rate (CPI-based, $REER = EP/P^*$)



*Calculated for 172 trading partners except for Honduras (67 trading partners)

**Here REER decline presents devaluation.

Source: Darvas (2012a)

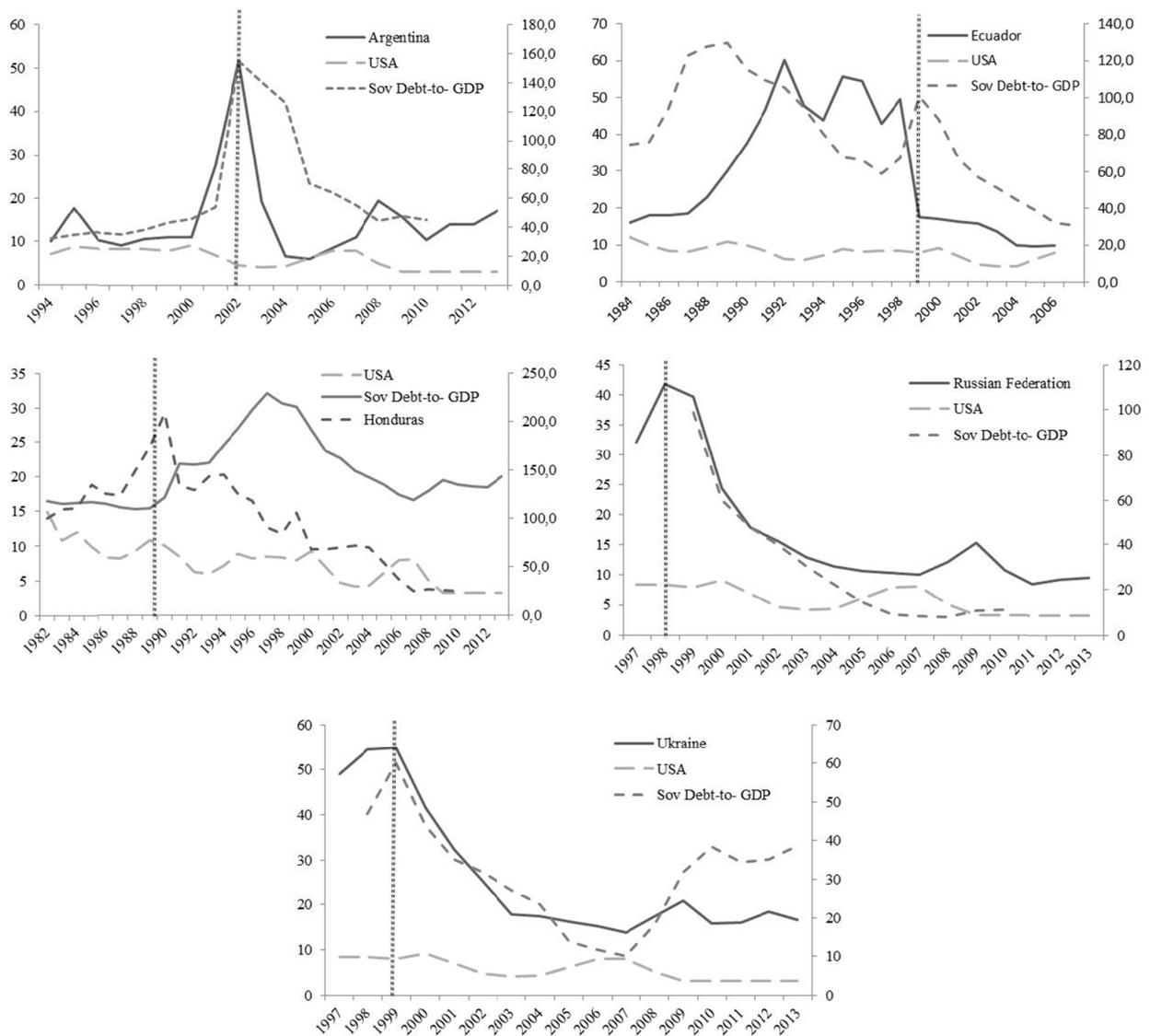
It is now left only to give some comments on the assumed relative importance of deviations from announced policies. Foreign and domestic packages of policies are given the same weight, since we do not see the reason to treat them differently. However, inside of domestic package, we give more weight to government consumption than to taxes. This assumption is driven by the premise that voters would be more prone to allow taxes increases than to suffer from the loss of some basic public services (hospitals, schools, courts etc.).

Other important features of our model include positive correlation between lending rates³⁰ and sovereign debt to GDP ratio, and strong negative correlation between investment level and lending rates. The latter is particularly important since the government's decision to default arises from the lower investments (and consequently income) in the wake of interest rates hikes. Our model suggests that when finally defaulted, country will not go through any significant GDP drop.

The data evidence is provided below. As it can be seen from Figure 4, lending interest rates peak at about same time as sovereign debt to GDP ratio, with Honduras being the only less obvious example. Both peaks coincide with the year of default as our model suggests. Also, at the time of default, lending interest rate spread between our countries and the USA lending rates (risk-free interest rate) is at its maximum, as our model indicates.

³⁰ Lending rate is the bank rate that usually meets the short- and medium-term financing needs of the private sector. This rate is normally differentiated according to creditworthiness of borrowers and objectives of financing. The terms and conditions attached to these rates differ by country, however, limiting their comparability.

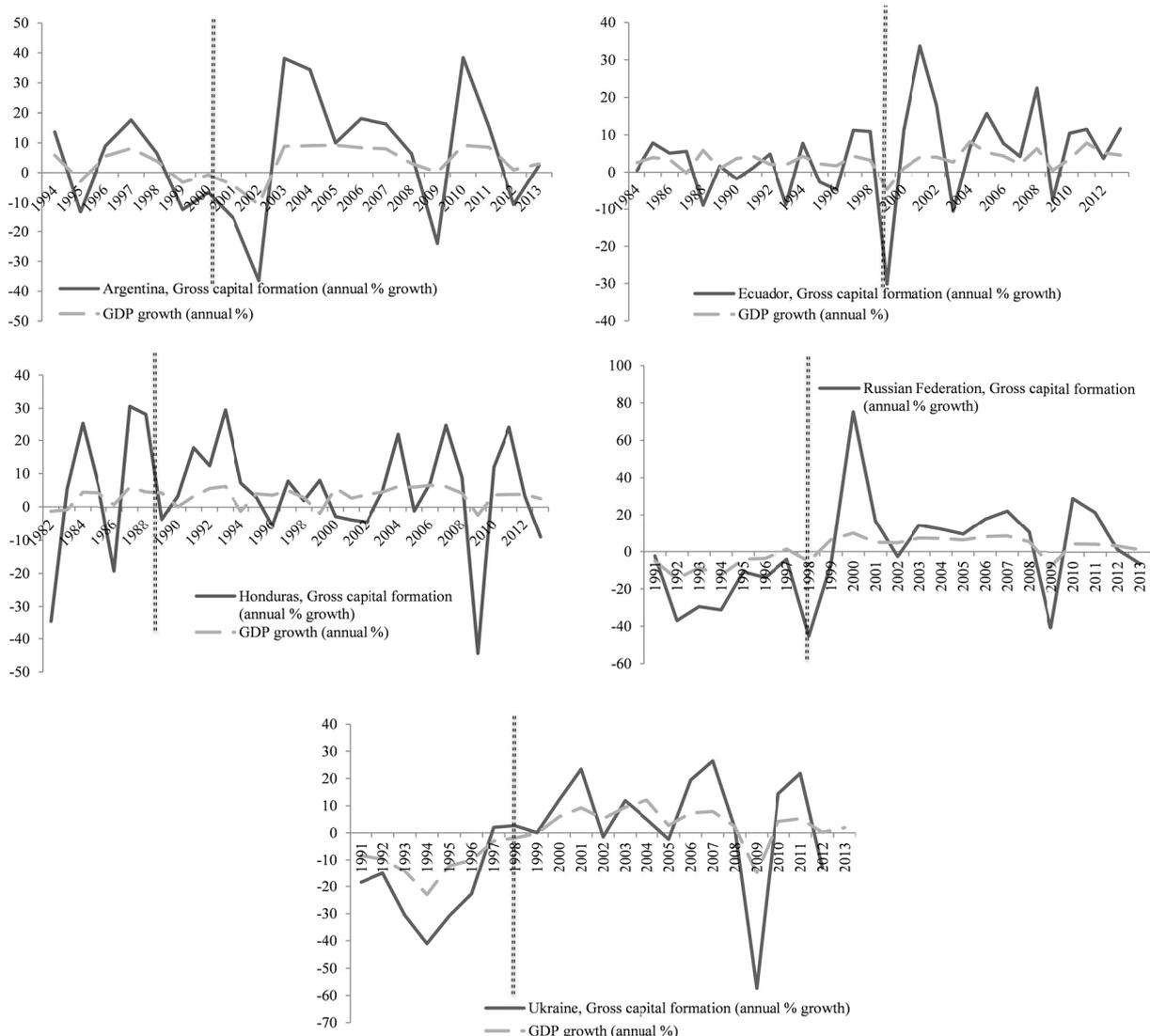
Figure 4: Lending interest rates (RHS) vs Sovereign debt to GDP ratio (LHS)



Source: World Bank, International Monetary Fund, International Financial Statistics and data files

Figure 5 confirms our hypothesis that the interest rate hikes in the wake of the default induce significant investment meltdown, while GDP growth rates show much lower variability in most cases, as it is assumed and is regular feature in an economy.

Figure 5: Gross capital formation (annual % growth) vs GDP growth (annual %)



Source: World Bank

One more assumption is exposed to a reality check. Namely, in our calibrated model we assumed that labour income share (wage share) equals 0.8. Depending on the measure, some countries are close to meet this assumption (Honduras and Ukraine), while others are not. However, we do not see a problem here, since it can be argued that our assumption that the only available source of consumers' income comes from wages is not entirely realistic. In that case, our wage share should be seen as corrected for other possible sources of income.

Table 3: Labour input shares

Country	LS1	LS2	LS3	LS4	LS5	LS6
Argentina	0,37	0,48	0,53	0,44	0,52	0,49
Ecuador	0,28	n/a	n/a	n/a	n/a	n/a
Honduras	0,6	0,73	0,8	0,75	n/a	n/a
Russian Federation	0,56	n/a	n/a	n/a	0,61	0,6
Ukraine	0,65	n/a	n/a	n/a	0,75	n/a

Source: Guerriero (2012)

5. CONCLUDING REMARKS

Our model is kept plain and simple enough to have numerous flaws and omissions. First of all, some of our conclusions rely on approximations of behavioural parameters which makes our model vulnerable to Lucas critique (Snowdon & Vane, 2006). This problem is amplified by the fact that we do not offer a sensitivity analysis of our conclusions in the context of assumed parameters. However, we will leave this shortcoming open to further discussion and future research.

The same goes for omitted dynamics concerns, credit market exclusion costs of default and the statistically non-rigorous (and non-robust) method of fitness of our model to the real world data check. However, eye-introspection based conclusions suggest that we could be on the right track, and that credibility concerns really do matter. We assume that our future work will go towards a more robust check of our conclusions.

Furthermore, we could test the validity of our assumption that governments give more weight to consumers than to producers ($\alpha > 0.5$). This could be easily done by examining whether the ruling governments in sample countries were left or right oriented at the time of default. Generally, we could use and explore comparative statics possibilities of our model much more than we did in this paper. In addition, there are many other political (political uncertainty, reputation constraints etc.) and economic (e.g. the output cost of default) constraints that our model omits.

Our model could also be expanded with typical producers' profit maximization and heterogeneous agents' assumptions. We believe that extension of our model with heterogeneous agents' assumption could have interesting and important implications for our conclusions. For example, we assumed that there is only one taxation possibility available to the government – taxes on consumption. This is a regressive tax. In that context, our imaginary government is more prone to default as it is proven in Andreasen, Sandleris, & Van der Ghote (2013). Moreover, our ignorance of the income distribution concerns ignores the empirical fact that "*all Emerging Economies have levels of income inequality significantly higher than the OECD average*" (OECD, 2012). In that context, the imaginary government is more reluctant to default than it would be if we assumed a positively skewed income distribution. However, this is a rather hard task for us at the moment.

We will end this list of shortcomings and recommendations for further research with our assumption that the elasticity of sovereign debt interest rates on expected future debt burden (budget deficit to GDP) is unaffected by sovereign debt to GDP ratio. Future research could include some threshold value of sovereign debt to GDP ratio after which the elasticity of sovereign interest rates to budget deficit to GDP ratio increases, as it is suggested in (Belhocine & Dell'Erba, 2013).

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TOURISM PLANNING IN THE REGION OF ISTRIA AND KVARNER: HISTORICAL OVERVIEW AND FUTURE PROSPECTS

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ABSTRACT

The aim of this paper is to present a historical overview and current trends in tourism planning and development in the coastal area of Istria and Kvarner, with particular reference to the seaside resorts of Portorož and Opatija now parts of Slovenia and Croatia respectively, but sharing a history of changing states and borders. Ever since its beginnings tourism has been an important industry in the area and the article brings the light to the impacts of changing political regimes and powers on tourism in the last 150 years. The main research question we tackled was how the constant socio-political changes influenced and transformed tourism development and planning and how they shaped the current tourism situation in Istria. The paper represents a part of one of the first comprehensive analyses in this field that was produced within an IPA cross border cooperation project between Slovenia and Croatia: *Tourism as a common (cultural) heritage in the coastal part of the Istrian peninsula (HISTUR)*.

1. INTRODUCTION

The region of Istria and Kvarner has been historically a turbulent area characterised with change - changing borders, changing rulers, changing regulations...all of which considerably influenced different areas of social and economic development of the region. Tourism as an important activity in the region was not exempt from these processes. Since its beginnings under Austro-Hungarian monarchy up until today, the tourism in Istria and Kvarner was significantly influenced and altered by the two world wars, in between period of Italian rule, the disagreements between Italy and Yugoslavia over borders after the WW2 and the period of A and B Zones under Free Territory of Trieste, socialistic Yugoslavia, and its dissolution, a period of independence of Slovenia and Croatia, and finally nowadays processes when both countries are also part of wider European Union as well as importantly influenced by integration and globalisation processes.

How did all these changes influence the region of Istria and Kvarner (Opatian Riviera) in terms of tourism development? Through the historical overview of tourism development and planning, we analyse how tourism was shaped by each political change and power and try to tackle the question how it influenced and transformed tourism development and planning and how they shaped the current tourism situation in the region. The paper represents only a part of one of the first comprehensive analyses in this field that was produced within an IPA cross border cooperation project between Slovenia and Croatia: *Tourism as a common (cultural) heritage in the coastal part of the Istrian peninsula (HISTUR)*.

2. THE BEGININGS OF CONTEMPORARY TOURISM IN INSTRIA AND KVARNER

While travellers visited Istria before contemporary tourism (see for example Kavrečič, 2011), the foundation for current tourism in Istria and Kvarner was set by Austro-Hungarian monarchy when Istrian cities of Opatija and later Portorož became a renowned health resorts in the monarchy and the Austrian Riviera (*Österreichisches Küstenland*), one of the crown lands of Austrian Empire. That was a period of large development and extensive infrastructure investments.

The beginnings of tourism in Opatija date to 1844 when Villa Angiolina was built and the area recognised for excursion and tourism purposes. In 1884 hotel Kvarner was built by Southern Railway Company and first guest statistics was recorded, while in 1889 Opatija was proclaimed the first seaside resort. The Southern Railway Company was an important driving force in development of Opatija as a winter residence of the Austrian gentlemen (Blažević, 1987; Kavrečič, 2011). As a tourist resort Portorož began its development at the end of the 19th century when it was recognised for its geographic position and mild climate and therefore attracted guests. In 1897 Portorož was formally recognised as a health resort, so investments in numerous smaller hotels and villas begun. The period of more extensive tourism development in Portorož was in the period between 1908-1912 when Hotel Palace was built (Blažević, 1987; Brglez et. al. 2005; Kavrečič 2011).

An important influence on tourism development in Istria had the Southern Railway connection of Vienna with the seaport of Trieste (1857) and later Rijeka (1872) and Pola (1876) (Studen, 2006: 62) that enabled regular connections of Austrian Riviera to Central Europe. Good transport links were an important basis for the successful development of tourism in Istria and Kvarner at that time, as well as through history. Lloyd for example, in

September 1944 established regular excursion boat (steamship) on relation between multicultural Trieste, Austro-Hungarian primary port, and Rijeka stopping also in other Western Istrian towns, such as Piran, Novigrad, Poreč, Rovinj and Pola (Blažević, 1987: 38). Later, when the sea transport and tourist trips became more widespread, numerous shipping companies offered transport on the northern and western Istrian coast (see Medvešček 1962, Lamut 2013). Tourism development and new travel possibilities also stimulated the expansion of printed promotion material, such as timetables of trains and steamboats as well as numerous tourist guides. Besides giving practical information, they were also promoting tourist places on the Austrian Riviera and their offer (Contento 1892, Furlani 1910; Bayer and Krbalek 1909, Abbazia: Landesverband für Fremdenverkehr im österreichischen Küstenlande, 1913 etc.). For example, a guide of Piran and Portorož issued in 1910 by Furlani was designed primarily for foreigners who have been in Portorož looking for health and relaxation. Starting in 1911 four times a year (for every season one number) *Indicatore di Portorož* was issued by the Commission spa providing information for tourists, such as: fees, price lists, programs of events, possibilities for walks and trips and much more. They also printed leaflets with the program of events to Portorož offer tourists (Pucer, 1985; Furlani 1910). Similar guides were issued for Opatija (Glax, 1902; Landesverband für Fremdenverkehr, 1913). Between 1906 and 1914 the tourists of Opatija were informed about timetables, events and activities through the weekly news *Kur – und - Bade-Zeitung der Österreichischen Riviera* (The health and bathing gazette of the Austrian Riviera) (Blažević: 1987).

From the perspective of tourism planning, Vienna as a centre of Austro-Hungarian Empire put a lot of effort into systematic tourism development and the promotion of the Austrian Riviera as an elite destination. In 1907 the Regional Association for the enhancement of foreigners traffic in the Austrian Riviera was established (*Landesverband zur Hebung des Fremdenverkehrs für das Österreichische Küstenland*) in Opatija, under the sponsorship of prinz Konrad Hohenlohe focusing on the area of Istria and Kvarner. Among other things it worked on transport connections with Opatija, since it established a bus line between Trieste and Opatija and planned to establish a direct train service between Munich and Opatija. An important part of their work was participating with promotion material on exhibitions across Europe – in Berlin, Dresden, Edinburgh, Vienna, and Sant Petersburg, Warsaw and Koper (Blažević, 1987: 113). Here it is worth to mention the exhibition in Koper in 1910 which was the first organised Istrian exhibition, in the framework of which also the promotion of Istrian bathing establishments took place as a part of the pavilion *Sea bathing resorts and sport*. The exhibition catalogue brought information on accommodation, restaurants, transport and safety (Osrednja knjižnica Srečka Vilharja, 1910). At the exhibition Portorož and Opatija were promoted through Health Commissions (Kurkomission) – at that time central information and promotion points, always mentioned also in various tour guides (Baxa, 1912, 1914, 1925; Landesverband für Fremdenverkehr, 1913; Woerl, 1913). Austrian Riviera tourist towns were promoted also through newspapers. In 1904, for example, a publication intended for the promotion of tourism in Istria and Dalmatia was established *Illustrierte österreichische Riviera Zeitung* (Illustrated News of Austrian Riviera). The newspaper included information on history, ethnography, possibilities for healthcare, natural beauties of Istria and Dalmatia, sport, culture and numerous advertisements and was distributed on passenger boat lines of European shipping agencies (Dobrić, 2015).

In 1913, provincial and regional offices were joined in the Austrian Association for the enhancement of foreigners' traffic (Blažević, 1987: 13). Besides national, regional and provincial efforts, development and promotion of Istria and Kvarner as part of Austrian

Riviera was also in the hands of a number of local embellishment societies that had the task to provide a decent reception of foreigners/tourists, to embellish the place, promote the place and provide necessary information for foreigners/tourists (Turistična zveza Slovenije, 2015). The section of Austrian tourism in Opatija club was established already in 1885, they for example worked on coastal promenade (lungo mare) Volosko-Opatija Lovran and hiking trails to Učka (Blažević, 1987: 61).

In the period between mid19th Century and the beginning of 20th Century towns of Opatija and Portorož developed in important Austro-Hungarian health and bathing resorts. This period was also characterised with investments and building of numerous hotels villas etc. By the end of 19th century Opatija became the centre of mundane Austro-Hungarian Riviera and an important summer and winter resort hosting many prominent names, among others Kaiser Franz Joseph with the family (Blažević, 1987, Kavrečič 2009). In 1909 Opatija hosted 39410 guests and in 1913 49187 (Blažević, 1987: 183). While Portorož never achieved the development of Opatija, it also became an important health resort in the monarchy and its numbers grew significantly, particularly after the construction of the Hotel Palace in 1910. According to Baxa between 1909 and 1913 the number of visitors grew from 3102 to 7250 (Baxa, 1914: 33).

Soon, however, the First World War broke out and importantly changed the course of successful tourism development in Istria and Kvarner.

3. TOURISM IN ISTRIA AND KVARNER BETWEEN THE TWO WORLD WARS

After the end of the 1st world war 1918 Istria and Kvarner fell under the jurisdiction of Italy (with Italo-Yugoslav agreement, Treaty of Rapallo in 1921) and from tourist perspective this was the period of stagnation of tourism in Istria. In this after war period, later joined with the world economic crisis (1929-1933), investments were scarce and Portorož and Opatija became less important resorts in Italy, as well as gradually repositioned from health to “sun and sea” destinations and from elite destinations to destinations for wider public. This is evident from the promotion material from that period aimed at wider public, highlighting the pleasant climate, sports and cultural activities.

With regard to the tourism planning and organisation, in 1919 Italy established a state tourism authority based in Rome (ENIT) - *Ente Nazionale Industrie Turistiche* with the aim to promote Italy for tourism. Its main tasks were to collect and process statistical data, information and news on tourism in Italy, its colonies and abroad, to promote tourism industry by financing hotel industry and creating hoteliers schools; to promote tourism culture and activities in Italy and abroad, to open information and ticket offices abroad (Gazzetta Ufficiale 22 Novembre 1919 n. 276, 1919). It was the main authority that influenced the organisation and planning of tourism in the region of Istria and Kvarner. Later, in 1936 also on a regional level, a number of such authorities were established and in 1936 such authority was established also in Istria - *Ente provinciale per il turismo per la Provincia dell' Istria* (Blažević, 1987: 191, 249) that had important influence on the region of Istria. Also influential for tourism in the region was the regional authority in Trieste *Ente provinciale per il Turismo Trieste* which along with many other private offices was responsible for tourist information and similarly was *Ente Provinciale per il Turismo Pola*.

ENIT was responsible also for tourist promotion; therefore national or regional offices published a number of publications (tour guides, brochures, leaflets etc.) in various languages promoting Istria (English, German, French, Croatian) as a tourist destination, such as for

example the brochures *Italian State Railways. The health-giving waters of Italy*. (1921) *Spas and sea bathing resorts Benvenuto/Willkommen/Bienvenu/Welcome!* (1937) or *Julijska krajina Trst Opatija, Brioni, Grado, Portorose, Postojnske Špilje, Gorica-Ratišta, Mali Lošinj, Sistiana Upute za turiste* (1937) describing towns of Istria and Kvarner and giving information on accommodation, information offices, discounts, sports activities, events etc.

Also characteristic for the period between the wars is the strong influence of politics on tourism planning and activities reflected in politically coloured newspapers, such as *Istria Redenta* in which tourism activities are presented in an ideological manner. (*L'Istria redenta*. 25. November 1922, *L'Istria redenta* 09. December 1922)

Touring club Italiano was another important actor in development and promotion of tourism activities in Italy. Established in 1894 by a small group of cyclists with intention to promote values of practical cycling and grew to 477.000 members in 1937. They installed first tourism road signs and published several tourist and gastronomical guides. Between 1933 and 1937 it published *Guida pratica al luoghi di soggiorno e di cura di Italia* (practical guides to resorts and spas in Italy). The guide includes also descriptions of Istrian towns, with the information on seasons, accommodation, sport activities and transport (Touring club Italiano, 2015; Touring club Italiano, 1933).

By becoming a part of Italy, coastal towns of Istria and Kvarner lost the central position they had within Austro-Hungarian monarchy and had to compete with many Italian coastal resorts. It is therefore not surprising that in between war period Istrian towns of Opatija, Lovran, Portorož, Brioni, Mali Lošinj did not achieve the maximum number of guests from the period of Austro-Hungarian rule (Blažević, 1987: 305). Generally, Italian government in Istria and Kvarner did not invest in their economic development (Darovec, 2008), therefore the whole area was economically stagnating.

Still, there were some initiatives to improve the competitiveness of the region. For example *Il Consiglio della Sezione Alberghi e Turismo della Federazione Fascista dei Commercianti* (The Council of the Hotel and Tourism Section of the Fascist Federation of merchants) tried to keep up with the competition of neighbouring Yugoslavia therefore in 1930 decided to establish *La zona franca del Carnaro* (free Kvarner zone) that included also Opatija (besides Rijeka, Volosko, Lovran, Mošenička Draga) the prices of tourism services could be significantly lower than outside this zone (by 10 % to 20 %). This, however, did not significantly help tourism, since for Opatian Riviera these was the period of deep crisis (Blažević, 1987: 218) Similarly, not even prosperous Cosulich family that tried to revive tourism in difficult post war years in Portorož was successful in this aim. They did, however, take over the management of Hotel Palace and took advantage of the vicinity of Trieste and attracted some guests also between the wars (Brglez et. al., 2005). In 1922 they established airline company S.I.S.A. (*Societa Italiana Servizi Aeronautici*) that started operating in 1926 and established a regular airline with Trieste, Grado, Venice, Pavia, Torino and other cities (Gombač and Brezovec, 2007; Blažević, 1987: 205).

Compared to the pre-war time the structure of guests changed significantly in favour of Italian guests that represented a significant number in Istria as a whole (Provinica di Pola); in 1923 for example out of 33715 tourists, 16715 were Italians which represents almost half of all tourists (Blažević, 1987: 193, 195). Good transport connections with Trieste enabled also development of daily or short- term tourist excursions between Trieste and coastal towns of Istria and Kvarner. The leaflet of the steamboat company "Istria-Trieste", for example promotes *gite di piacere* (pleasure trips) from Grado to Portorož – Sunday half - day trips,

offering round tickets for 8 liras. (Istria-Trieste S.A. di Navigazione). The multilingual booklet *Benvenuto/Willkommen/Bienvenu/Welcome!* (1937), as many others from that period, gives information about daily connections of Trieste with Portorož by steamboat, railway and hydroplanes as well as highlights short and picturesque drive by car. At that time the main forms of tourist transport in Istria were trains or steamboats, however also transport by car and later also bus became more interesting. In 1933 in Istria there were 659 cars and 44 buses, while Trieste had 3065 cars and 71 buses (Blažević, 197: 235).

In relation to tourism transport there were numerous actions, particularly in the period of recession, aiming to improve the unfavorable situation in tourism, many of which promoted by ENIT. Below are some examples:

- From 1926 onwards Italian railways offered 50 % of discounts for return tickets for foreign tourists for those wanting to visit Istrian and Kvarner towns of Opatija, Pula (Brioni), Poreč, Portorož and Piran or some other northern Adriatic towns (Blažević, 1987: 205)
- Foreigners and Italian citizens living abroad and staying in Italy at least 6 days had the following discounts: 50% for individual railway travels, 70% for group railway travels and for those who owned at least 12 hotel vouchers (that could be bought in ENIT) had 60 % of discount for travel in the 1st class and 55 % for travel in the second class („Benvenuto/Willkommen/Bienvenu/Welcome!“)
- In 1929 Italian ministries have adopted the regulation according to which foreign bathing tourists were exempt from paying tourist tax (Blažević, 1987: 216)
- In 1933 the steamboat society Istria-Trieste offered 30% of discount for the members of the Touring Club Italiano if a group was consisted of at least 20 members. The discount was offered on the following lines: Trieste-Piran-Umag-Poreč-Rovinj-Pula; Trieste-Zadar; Trieste-Treviso and some others (Blažević, 1987: 231)

While tourism in Istria and Kvarner never reached the numbers as before the war, the numbers of tourists that were really low in the first post war years (1919-1923), in the later years significantly increased (Table 1).

Table 1. The number of tourists between the two wars in Opatija (since 1919) and Portorož (since 1931)

Year	The number of tourists	Year	The number of tourists	
	Opatija		Opatija	Portorož
1919	728	1930	40013	/
1920	1765	1931	32493	6194
1921	3806	1932	24404	/
1922	7502	1933	25000	/
1923	18351	1934	28795	3698
1924	32159	1935	30022	1390
1925	42723	1936	35238	4270
1926	37287	1937	41610	5354
1927	28722	1938	37308	4997
1928	31514	1939	24239	3409
1929	36487	1940	13324	1603

Source: Blažević, 1987 (286, 289-290)

Gradual recovery of hospitality and tourism that in 1941 for example represented the second largest industry in the Slovenian part of Istria (Rogoznica, 2005: 396) was stopped by the WW2.

4. TOURISM IN ISTRIA AND KVARNER IN SOCIALISTIC YUGOSLAVIA

During the war, tourism declined and many tourist capacities were destroyed and devastated. Immediately after the WW2 tourism Istrian territory was marked by political tensions related to the agreements about the border between Yugoslavia and Italy. After the Treaty of Peace with Italy from 1947 the Free territory of Trieste was formed comprising the part of Istria from Trieste to Novigrad, while the rest became part of Yugoslavia. This territory was divided in Zone A under the control of the Western Allies and Zone B under the control of the Yugoslav army. With London memorandum in 1954 the whole territory of Istria became part of Yugoslavia (Rogoznica, 2005; Darovec, 2008). All these (political) issues influenced the development of tourism in the area of Istria and Kvarner.

With regard to the tourism industry, as a part of planning economy, in the Zone B it was under the influence and control of *Istrski okrožni ljudski odbor* (Istrian county peoples committee) and the *Vojaška uprava Jugoslovanske armade* (Military administration of the Yugoslav army.) The beginnings of tourism development were difficult, particularly due to the need for reconstruction of the infrastructure, lack of trained staff, international market, food products, suppliers etc. (Rogoznica, 1996: 14). The company Riviera Turist Hotel had a special role in the reconstruction of tourism, including the role of managing of hotels, restaurants and bars, entertainment, maintenance etc. (Rogoznica, 2005; SI PAK KP 24, t.e. 137, a.e. 351; SI PAK KP 24, t.e. 121).

The after war period in Istria and Kvarner was characterised with the re-building of touristic infrastructures and orientation towards domestic tourism, particularly excursion tourism and union tourism in line with socialistic ideology of equality and unity. In 1949 for the first time workers from Zone B could spend holidays in union holiday homes in Slovenia, while workers from mainland of Slovenia came to Portorož, Fiesa and Savudria (Rogoznica, 2005; Rogoznica, 2009; SI PAK KP 24, t.e. 137, a.e. 351, Repe 2008). After 1954 and London memorandum, when whole territory of Istria became part of Yugoslavia, tourist development became more intensive and similarly as all other economic activities it was centrally planned. At the beginning it was oriented towards domestic market and vacations for workers. As a part of social tourism strategy a number of workers' holiday centers were renovated and constructed along the Istrian coast.

In the 50is Yugoslav Tourist Association was formed with the tasks to coordinate the work of the associations at the level of Republics, to create possibilities for the tourism development, information and propaganda and to cooperate with international tourist organisations. Similar tasks (with the exempt of international cooperation) had the associations at the level of Republics (Repe, 2008). Promotion activities were partly decentralised - republican and locally based associations could produce their promotion material, while Yugoslav Tourist Association, also centrally financed, conducted promotional work of a non-commercial nature in the interests of the federation as a whole. (Tchoukarine, 2010). Tourism associations printed tourist journals, magazines, and brochures, and shot tourist films. They also organized large exhibitions on tourism and leisure, with both "promotional and educational character" (Duda, 2010: 54). Tourism became a more important economic activity even if sometimes it was still a little drew back by two ideological prejudices – fear of rapid enrichment of population and the idea that hospitality business is humiliating for locals serving foreigners and not in line with socialistic ideology. Yugoslavian crisis in the 60is changed this view of tourism, since foreign currency inflow was particularly important (Repe, 2008).

According to Rogoznica (1996: 17) an important turning point in Yugoslavian tourism development represented the 4th plenum of the Central Committee of the League of Communists of Yugoslavia in 1962, since it clearly evaluated its meaning in the future socio-economic development of the country. The newly established tourism organisations, such as Council of tourism at the Chamber of Commerce of the Republic of Slovenia recognised the importance of cooperation in the wider region of Istria and Kvarner. Building of new accommodation facilities and infrastructure as well as education of employees in tourism industry (for example opening of the higher school for Hospitality and Tourism 1960 in Opatija) became more intensive.

Coastal towns of Istrian peninsula were slowly opening for foreign tourism and Istria gradually oriented towards sun-sand-sea mass tourism, promoting itself as financially favourable destination. As a Mediterranean holiday destination catering to low-income tourists, Yugoslavia benefited from the European boom in mass tourism in the 1950s and 1960s (Taylor and Grandits, 2010). Istrian peninsula became attractive and due to good geo-strategic position and expansion of automotive industry also accessible tourist destination. Until 1970s and 1980s Istria became and remained one of the main Yugoslav workers' holiday centres, and an important summer meeting point for Yugoslav tourists in general, as well as for millions of foreigners (Duda, 2010). Besides through workers' holiday centers and construction of numerous private holiday homes as well as camping amenities, this was enabled through construction of numerous hotel resorts on the western shores of the Istrian peninsula – Portorož, Poreč, Umag, Pula, Vrsar, Rabac. Portorož was facing intensive development and investments and was completely restructured in that period. Between 1965 and 1985 accommodation amenities more than doubled and the number of guests tripled (Balazič, 2010). In this period also in Opatija and its Riviera (Volosko, Ičići, Ika and Lovran) few large hotels with congress facilities were built, similarly orienting it toward mass tourism. The main feature of the intensive tourism development in Istria and coastal part of Kvarner was that it was based on masses, its accommodation amenities were main element of tourism development and the main motive for tourism visit were sun and sea.

Particularly in the period of mass tourism development, Istria was seen as one, interdependent area which was reflected also in the close cooperation of Slovenian tour operators and travel companies and Croatian accommodation facilities. Kompas Yugoslavia and Globtour were the most important travel agencies in the Istrian market, linking foreign tour operators and local accommodation offer, while Slovenian Slavnik Koper was the most important transport company in Istria (Gosar, 1989 in 2014). As highlighted by Gosar (2014) regionalistic tendencies and common history played an important part in good cooperation in Istria.

Another border change and significant influence for tourism happened after 1991 and independence of Slovenia and Croatia.

5. TOURISM PLANNING IN ISTRIA AND KVARNER AFTER 1991

After the disintegration of Yugoslavia in 1991 and independence of Croatia and Slovenia former borders between republics were transformed into national borders. The national border significantly changed lives of those living along the border and became an obstacle to cross – border cooperation (Pipan, 2007). Previous close cooperation between Slovenia and Croatia in the field of tourism ended almost instantly and each country adopted their own laws and strategy of tourism development. Both countries began the processes of transition from

central planning to market economy and privatisation of formerly mainly state owned tourist infrastructure and amenities as well as gradual diversification of tourist offer.

Immediately after the independence both countries recorded a major decline in tourist activities. Due to the war in Yugoslavia there was a significant decrease in tourist arrivals and overnight stays. The tourism in Istria and Kvarner was influenced also by the Croatian homeland war between 1991 and 1995. For Slovenian part of Istria this was reflected in the increased number of domestic tourists. For security reasons Slovenian tourists avoided popular holiday destinations in Kvarner, Croatian part of Istria and Dalmatia and stayed in Slovenia. This trend was evident until the end of the war in 1996 when once again there were less domestic visitors in Slovenia (Brezovec and Pak, 2011). After the stabilisation of political situation, the number of arrivals and overnight stays in Istria gradually increased accounting for 2 980 663 arrivals and 19 445 130 nights and 582.370 arrivals and 2.009.298 nights in 2013 for Croatian and Slovenian Istria¹ respectively (Croatian Bureau of Statistics, 2015; Statistical Office of Republic of Slovenia, 2015). Guests prevalently come from neighbouring countries and regions (Italians from nearby regions, Austrians, Hungarians, Czech, Slovaks, Bavarian Germans and Slovenians) (Gosar, 2014).

Soon after the independence both, Slovenia and Croatia adopted various documents of tourism development, influencing also the tourism development in Istria. Both countries developed their tourism strategies: Slovenia in 1992 –*Strategy of tourism development in Slovenia* (Širše et. al, 1993) and Croatia in 1993 - *Development strategy of Croatian tourism*. In the Strategy of development of Slovenian tourism 2012-2016 (11) that period was described as follows: “After 1991 key tasks were primarily focused on the restructuring of the tourism economy, privatisation of the hotel sector, reconstruction of housing, the creation of new tour operators and travel agencies, airlines, complete openness to foreign markets and also to destinations abroad for Slovenian tourist.”. Similarly, the main aims highlighted in the of *Development strategy of Croatian tourism* from 1993 were twofold: a) reconstruction, complete evaluation and protection of tourism potential and b) the construction of a new identity and market positioning of Croatia as one of the leading tourist countries in Europe and the Mediterranean. Both countries tried to (re) position on the tourism market.

Besides national strategies, such as the current *Croatian Tourism Development Strategy until 2020* or *2002 – 2016 Slovenian Tourism Development strategy* and their previous versions, various regional or local (short – term) strategies were adopted. With reference to tourist development in Istria, for Croatian part the foundation of The Istria Tourist Board in December 1994 was particularly important. Its main task is to support, maintain, improve and promote of all the county’s existing tourist resources and potential and to create a strong and recognizable brand for Istria, all in line with sustainable development principles (<http://www.istra.hr/hr/pr/tzi/o-nama>, 2015).

The most important document with the aim to reposition Croatian Istria from 3S destination to diversified tourist offer in accordance with natural and acquired comparative advantages was the *Tourism Master plan of Istria (2002-2010)*. Different parts of Istria were divided to six coastal tourism clusters and inland cluster as a special cluster and differently positioning, from destination of active holiday and sport (Umag) to gastronomy and traditional life style destination (central part of Istria), cultural heritage and active experiences (Poreč), cluster characteristic for its history and culture as well as aimed as a destination for families based on

¹ Coastal municipalities of Koper, Izola and Piran.

natural values (Pula/Medulín) etc. Cluster Vrsar/Funtana as a fishing town for nature and art lovers, Rovinj as a romantic cultural Mediterranean town and Labin/Rabac focusing on natural heritage and art. Opatija is not part of Istrian region, but similarly tries to reposition itself as a mundane Mediterranean Riviera. It is interesting that the current *strategy of tourism development in the municipality of Piran 2009 – 2015* includes also comparison of destination Portorož/Piran with Opatija in which it is recognised as a “leading Croatian tourist destination for organisation of congresses, seminars and conferences that in the last years developed also a wellness product”, which had positive impact on the season of this once pronounced summer seaside resort (Strategija razvoja turizma v občini Piran 2009 – 2015, 4)

Slovenian Istria does not have a comprehensive Master plan, covering Slovenian Istria as a whole, but partial strategies for different municipalities, such as for example current *Strategy of tourism development in the municipality of Piran 2009 – 2015* and *Strategy of tourism development in the municipality of Izola 2009 – 2015* and their previous version which include action plans for a certain period. Similarly as in Croatian Istria, also in Slovenia, the aim has been to diversify tourist offer in the area. In the current *Strategy of tourism development in the municipality of Piran* as one of the most touristic areas (including Portorož as a brand) the identified key comparative advantages are geographical location, climate, preserved nature (hinterland), natural and cultural heritage, the charm of tourism tradition and the vision is to preserve natural and cultural heritage as the foundation of a new tourist attraction that combines all the diversity in new experiences: at the same time the excitement of cosmopolitan resorts and serenity of traditional environments. Its products are very diversified - from wellness, spa and health tourism (having priority), to sport tourism, congress tourism, gambling, cultural tourism, eko tourism, youth and thematic tourism etc. Similarly diverse is the product of the whole Slovenian Istria – while Portorož/Piran builds upon the mix of mundane and traditional; Izola highlights its tradition as a fishing town and cultural heritage (*Strategy of tourism development in the municipality of Izola 2009 – 2015*), Koper is orienting towards cruise tourism, other towns towards wellness, health or social tourism.

The common denominator of the tourism development in the last decades in both parts of Istria and Kvarner is deviation from the 3s tourism towards diversified tourism offer, including wellness, gambling, sports, natural and cultural heritage. The main comparative advantages of Istria (as a whole) recognised in both strategies are its favourable geostrategic location, accessibility, gastronomic offer, preserved nature, rich multicultural and historical heritage (see also Brezovec et. al., 2007). But they also share the common past and current unity within the EU area. All of this could be the foundation for a better cooperation in the future.

6. CONCLUSION: FUTURE PROSPECTS FOR COMMON TOURISM DEVELOPMENT

As presented, through this brief historical overview tourism has always been important economy in Istria and Kvarner, but its development and planning were shaped by constant geopolitical changes in the region. In some periods, cooperation and interconnection between nowadays Slovenian and Croatian part of Istria as well as Kvarner (Opatian Riviera) were stronger, a part of one common tourism development strategy, while, for example, in the last 25 years Slovenian and Croatian Istria as well as Opatian Riviera developed separately, but nevertheless to some extent in a similar direction. Today, Slovenia and Croatia are both also part of transnational European Union, therefore tourism planning and development are shaped

also by its guidelines and policies. The EU integration policies and the removal of border restrictions could be an opportunity to (re)establish closer cooperation.

Important opportunities in this direction offer numerous cross – border development projects and initiatives that could (and already do) enable increased cooperation between Slovenia and Croatia in the field of tourism. Some of them were already implemented as a part of INTERREG or IPA Slovenia - Croatia cross border cooperation programmes. This is particularly so, since sustainable tourism is the common thread in tourism strategies of both countries and “in the European Commission programmes and rhetoric, too the sustainability of the tourism industry is inextricably bound to territorial cohesion, cross – border cooperation and networking which are understood as the basis for economically and socially – and thus environmentally – sustainable development in the EU region (2008: 32). While relational distance created by the border as well as dependence of cross – border tourism on programme funding could also be a drawback in common tourism development in border areas (Prokkola 2008), the specific situation of Istria, a common history and already existing sociocultural cohesion could be an advantage for the joint planning and development of this area.

An opportunity in this field present the non-coastal areas of Istria, areas which have been mainly neglected in the past tourism development. Tourism could be an opportunity for the revitalisation of these mainly rural areas. This has been recognised also through the Tourism Masterplan of Istria, since a central part of Istria cluster focusing on traditional lifestyle and gastronomy and partly also through the strategic documents on tourism in Slovenian Istria. One of the opportunities for common tourism developments in these areas certainly offers cultural heritage in all its forms (see also Guštin, 2010) which Istria does not lack. Besides urbanistic and architectural heritage, such as castles, fortresses, fortified settlements, murals, archaeological monuments (Brezovec et. al. 2007), cultural heritage of Istrian hinterland offers numerous other opportunities for common tourism development - from gastronomy and enology to festivities and traditional life itself. In the last decade, there have been some examples of the use of cultural heritage for the purposes of joint cooperation in tourism, creation of innovative integrated products as well as revitalisation of Istrian rural areas, such are for example revitalisation of the route of the former narrow – gauge railway - Parenzana - "Route of health and friendship" for recreational and tourism purposes, gastronomic and wine tourist itineraries or ongoing Malvasia Touristria aiming to integrate Istrian Malvazija wine and its branding in an integrated tourism product. Last, but not least, also the project HISTUR - *Tourism as a common (cultural) heritage in the coastal part of the Istrian peninsula* within the framework of which this historical overview has been conducted aims exactly this, to use the common history and heritage in tourism for the future tourism development in Istria.

One of the important challenges for the future would be how to create a comprehensive and integrated tourist offer of Istria that includes cooperation of different providers of partial tourism products. Namely, here is a need for greater cooperation at all levels, among the providers, local communities as well as between the two countries as a whole. This represents a challenge as well as an opportunity to create joint tourism models and strategies for tourism development Istria and Kvarner. Already existing initiatives are the solid first step in this direction.

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OPTIONS TO BOOST THE DEVELOPMENT AND SUSTAINABILITY OF THE CROATIAN ECONOMY BY CREATING COOPERATIVES

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ABSTRACT

Cooperatives constitute an important part of the European economy; however, their potential is not fully tapped. European post-socialist economies have been faced with difficulties in shifting the mindsets of both entrepreneurs and public administration structures towards cooperatives. The purpose of this paper was to investigate the options to boost the development and the sustainability of the Croatian economy by creating cooperatives. For the purpose of empirical research, a survey was conducted on a sample of 30 agricultural cooperatives on the territory of the Republic of Croatia. Cooperatives in Croatia are essentially small companies engaged in several business activities, among which procurement and sales prevail, while production and processing are less represented. Although state aid measures for cooperatives are in place, the funds for this purpose are dislocated and scattered in terms of competences and finances. Therefore, it is necessary to adopt a national strategy for the development of cooperatives, to network and connect the organizations which encourage the development of cooperatives, and to promote cooperatives as the main driving force behind SMEs.

1. INTRODUCTION

The overall objective of the 2013-2020 Strategy for the Development of Entrepreneurship in Croatia is to increase the competitiveness of small businesses in Croatia (Ministarstvo poduzetništva i obrta, 2013). According to the Global Competitiveness Report 2014-2015 of the World Economic Forum, Croatia is ranked 77th on the Global Competitiveness Index among 144 countries and stagnates with a score of 4.13 (World Economic Forum, 2014). The stagnation results from the lack of structural reforms, which are essential to a long-term, sustainable economic development. “Competitiveness is at the core of a firm’s success or failure” (Porter, 2008, p.21). In order to be competitive on today’s hypercompetitive global market, small enterprises have to join forces. In general, cooperation and association constitute a natural part of human culture, which improves the economic and social life. The social consequences, i.e. the outcome of creating cooperatives, are a more rapid growth and increased sustainability of the economy, the strengthening of the community, the cooperation of farmers and small entrepreneurs who act together, learn from each other and help each other. This also results in increased involvement and activity of cooperative members in the civil society.

The full development of rural areas is important for the diversification of the rural economy. At the time of modern structural processes and events it faces many problems such as depopulation, aging population. Generally, these areas have increasingly low socioeconomic indicators, which make them passive and undesirable for life. For practical reasons, cooperation and association constitute one of the key ways in which a small farmer may survive in view of a series of biological and climatic factors, which expose agricultural production to great uncertainty. Furthermore, a “farmer” is always “small” compared to his trade partners because he cannot dedicate himself to his demanding biological production and trade at the same time. Consequently, the demographic, economic and market forces urge him to join in cooperatives in order to protect himself from the risks, to get more bargaining power and benefit from the effects of an “economy of scale” in terms of production, processing and distribution. Since the market requires increasingly larger quantities of products of a uniform quality, the value added and distinctiveness of their products on the market is also achieved by means of branding. Agricultural cooperatives may thus provide an alternative to the economic crisis and the high rate of youth unemployment in Croatia and play a major role in rural development.

“Agriculture has a particular place in the Croatian economy because, together with the food industry, it accounts for 10% of the GDP” (Tratnik, Radinović and Žutinić, 2007, p.67). Agricultural cooperatives are the largest type of cooperatives in the Republic of Croatia and constitute more than 40% of the total number of cooperatives (Hrvatski savez zadruga, 2013). This allows them to turn into a major organizational form of SME-s. The ever increasing challenges of globalization and the free market require changes in the strategic approach. Therefore, it is necessary to investigate the agricultural cooperatives in the Republic of Croatia in order to establish the factors of their success, their strengths and weakness, as well as the prospects for and threats to development. It is also important to compare the Croatian agricultural cooperatives in the Republic of Croatia with those in the EU to see which factors have an impact on the development and creation of cooperatives and how they could be used for the development of agricultural and other cooperatives in the Republic of Croatia.

The purpose of this research is to show how the positive experience of creating agricultural cooperatives may be used to create a cooperative mentality, with the aim of increasing the competitiveness of SME-s in the Republic of Croatia. The research sought answers to the following questions:

- What are the positive and negative experiences of boosting cooperatives in the EU?
- Are there any negative experiences (perceptions) of creating cooperatives in countries in transition?
- What are the positive and negative experiences of agricultural cooperatives in the Republic of Croatia?
- Which state aid measures could encourage Croatian farmers to create cooperatives?

2. RESEARCH METHODS

The secondary research was conducted by collecting data from the available literature on cooperatives, strategic documents, laws and statistical databases. The primary research was conducted by analysing documents and conducting a survey. The questionnaire was sent by email to 245 of a total of 472 agricultural cooperatives in Croatia, making sure that all regions were equally represented. Duly completed questionnaires have been returned by 30 of them.

3. COOPERATIVES

The International Cooperative Alliance defines the cooperative as an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs through a democratically controlled enterprise (ICA, 2014). Other types of cooperative organizations are defined in addition to cooperatives (World Co-operative Monitor, 2013):

- *a mutual* is a private cooperative type of organization providing insurance or other related services;
- *a co-operative of co-operatives/mutual* is a cooperative composed mainly of cooperatives/mutual that carry out an economic activity for the production of goods or the provision of services of common interest for their members;
- *a co-operative group* 1) is composed of organizations that operate as a single economic entity, 2) regularly publishes a consolidated financial statement, 3) includes mainly cooperatives, 4) acts according to cooperative principles and values, 5) is controlled by cooperatives;
- *a co-operative network* 1) is composed of organizations that operate as a single economic entity, 2) does not publish a consolidated financial statement, 3) includes mainly cooperatives, 4) acts according to cooperative principles and values, 5) is controlled by cooperatives;
- *a non-co-operative enterprise* is an enterprise controlled by cooperatives.

The basic principles of cooperative activities are the guidelines by which cooperatives put their values into practice (ICA, 2014): voluntary and open membership, democratic management, economic collaboration of members, autonomy and independence, education cooperation among cooperatives, and concern for the community. These principles constitute a uniform “charter”, which bridges the gap between different cultures, languages, religions and politics. The cooperative movement is deeply rooted worldwide regardless of religious, national or political aspects. Throughout history it has remained in place and stable because it relied on the civilizational values and was based on principles, such as: mutuality, freedom of action, and equitable distribution. These values were successfully incorporated in specific forms of entrepreneurial activities (Mataga, 2005).

The cooperatives’ value system, fundamental principles and principles of operation create the modern concept of social economy. Social economy is constituted by “a set of private, formally organized enterprises, with autonomy of decision and freedom of membership, created to meet their members’ needs through the market by producing goods and providing services, insurance and finance, where decision-making and any distribution of profits or surpluses among the members are not directly linked to the capital or fees contributed by each member, each of whom has one vote” (Chaves and Monzon Campos, 2010, p.116).

Social economy appears as a bridge between the private and public sectors. Chaves and Monzon Campos state that “the shared core identity of the social economy is fortified by a large and diverse group of free and voluntary microeconomic entities created by civil society to meet and solve the needs of individuals” (Chaves and Monzon Campos, 2010, p.118). Social economy bridges the gap of the social needs of the individuals, societies and nations, while creating a mutual benefit at the same time, and it “enables the application of entrepreneurial principles (assumption of risks, responsibilities, innovativeness...) in the public sector, with the aim of improving the quality of life” (Škrtić and Mikić, 2007, p.154). Consequently, cooperatives and cooperative associations may also be observed in terms of social economy.

Historically, cooperatives were formed by spontaneous association for the purpose of meeting common interests. They emerged in response to the circumstances caused by social revolutions, economic changes, and poverty in rural areas. The creation of production, agricultural, workers’, consumers’, and savings and loan cooperatives resulted from the need to increase the producers’ market power, reduce the costs of intermediaries and retail prices as well as the opportunity to independently operate one’s own business, ensure business and assistance,

Cooperatives were initially established as a means for working individuals to meet their own daily needs, as a route to building a better society. Their vision was not exclusively limited to loan services or retail trade; it aimed at improving, by means of self-help, their working and living conditions and life in the communities in which they operated. Originally, cooperatives stood for linking, solidarity and working together.

The early days of the cooperative movement can be followed since the second half of the 18th century (Couderc and Marchini, 2011). Since then, many philosophers, politicians, intellectuals and theorists have contributed to the development of cooperative theories, such as K. Marx, G. C. Marshall, Pantaleoni, Ward and others, and they have emphasized various theoretical issues, which may have an adverse impact on cooperatives (Sexton, 1986; Staatz, 1983; Zusman, 1982; Cook et al., 2004).

3.1. Cooperatives in the EU

In the European Union, the term “cooperative” refers to an autonomous organization of members united voluntarily to meet their common economic, social and cultural needs through a democratically controlled enterprise owned by them. The basic characteristics of cooperatives are (European Commission, 2014): a) the possibility to freely, openly and voluntarily join in and withdraw from a cooperative enterprise; b) a democratic structure providing each member with one vote, decisions being made by the will of the majority, and the appointed management reporting to the cooperative members; c) an equitable distribution of profits; and d) autonomy and independence.

Cooperatives and cooperative enterprises perfectly fit in the EU 2020 Strategy (European Commission, 2010), which is aimed at sustainable economy, brings people and responsibility to the forefront in the continuous struggle against exclusion, and puts the emphasis on shifting to a green economy. Cooperatives operate in such a manner that they put the people at the core of the operations, while making long-term profits for the community at the same time. The activities of cooperatives have a significant impact on the life of the citizens of Europe. They contribute to the citizens’ prosperity and the nation’s wealth, and promote enterprise and mutual cooperation among entrepreneurs.

In the framework of the European Employment Strategy, the EU has identified the cooperative sector as a key partner to promote social inclusion and strengthen social cohesion in Europe through education and employment, creation of new jobs and provision of social facilities and services. The European Commission believes that the cooperatives’ potential has not been fully used and that the “image” of cooperatives needs to be improved both at the European and national levels of the member states (European Commission, 2010).

The Commission also states that special attention should be paid to new member states and candidate countries, where the cooperative instrument is not fully utilized in spite of extensive reforms. Cooperatives in the EU are becoming an increasingly important driver for the achievement of many objectives in the community in which they operate, such as employment policy, social integration, regional and rural development, agriculture, etc. It is important to maintain this trend as well as the presence of cooperatives in the programs and policies of development of the community in which they operate, and to further use and promote them (European Commission, 2010).

Almost all EU member states have a cooperative act. Most European countries have a general cooperative act, although in certain countries cooperatives are regulated by general regulations, civil regulations or trade regulations. EU member states have special laws on cooperatives, although many of them also have cooperatives established in accordance with the Statute for a European Cooperative Society. The Statute was adopted on July 22, 2003 for the purpose of providing a legal framework for cooperative business operations, facilitating and simplifying cross-border and transnational activities (Babić and Račić, 2011). This Statute makes it possible for cooperatives to be established by natural persons from different member states or by legal persons incorporated in different member states.

A European cooperative is a legal person whose members carry out different activities together, while maintaining their independence at the same time. With a minimum share capital of 30,000 euros, these new European cooperatives may operate on the whole territory of the EU with a unique legal identity, regulations and structure. It may expand its cross-

border activities without any extra costs or having to spend time on establishing a network of dependent companies (Babić and Račić, 2011).

Cooperatives from different member states can now join forces and form a European cooperative. The objective is to enable an increase in their competitiveness, to facilitate access and enable their joint appearance on the European market, to allow easier access to the capital market, to reduce the costs related to the constitution of dependent companies in other member states, to promote the cooperative as a special and desirable economic agent, to facilitate access to the results of new product research and development, to enable easy access to business information and to develop cooperatives.

Cooperatives are an important part of the European economy. According to data of the European Commission (2014), there are approximately 250,000 cooperatives in the EU, with 163 million members and approximately 5.4 million employees. Cooperatives also hold a significant market share in key industries in most of the EU member states (European Commission, 2014): in agriculture (83% in the Netherlands, 79% in Finland, 55% in Italy and 50% in France), forestry (60% in Sweden and 31% in Finland), banking (50% in France, 37% in Cyprus, 35% in Finland, 31% in Austria, 21% in Germany), retail trade (36% in Finland and 20% in Sweden), and in the pharmaceutical and health care industries (21% in Spain and 18% in Belgium).

3.2. Cooperatives in countries in transition

As a result of the collapse of centrally planned economies, it was a major challenge to reestablish a cooperative identity and introduce a new cooperative system. In the first phase of transition, governments opposed the activities of cooperatives, considering them as part of the communist heritage. Their transformation into capitalist companies allowed a new insight into the potential of cooperatives in the creation of social communities. At the beginning of the transition, the economics literature was critical of the potential role of employee ownership in the restructuring of companies. This move was expected to result in inflation, deterioration in economic performance, considerable delays in restructuring and a low propensity to make necessary investments (Borzaga and Spear, 2004, p.32).

Upon the decline of communist regimes, cooperatives had to redesign their business strategy and develop entrepreneurial skills. The transition towards a market-oriented economy took different forms (Borzaga and Spear, 2004, p.33): restitution of property to their former owners (Czech Republic, former German Democratic Republic), privatization by means of negotiable coupons, distributed to members, employees and former owners and sold to interested parties (Hungary, Russian Federation, and Baltic States), dissolution and liquidation.

While some countries decided to dissolve all politicized unions and federations, others opted for a sort of “planned transition”, also through employee ownership. The efforts to depoliticize cooperative unions, federations and apex organizations proved to be a difficult task. There was an obvious lack of leaders with experience of autonomous, market-oriented cooperatives, and the cooperatives were weakened and completely disoriented through the transition process (Borzaga and Spear, 2004, p.33).

The International Labour Organization points out two major obstacles to the development of the cooperative sector in former socialist countries (ILO, 2001, p.19-23). The first major obstacles to the establishment of new cooperatives of farmers, traders, craftsmen and

freelancers was the fact that during the first years of the new "regime" there were not enough private farms, businesses and individual entrepreneurs to constitute a membership, even after a whole decade of liberalization. The second obstacle was the lack of an adequate legislative framework regarding ownership of land, property rights and access to financial services. Although the economy was liberalized at high speed, reforms of government structures at national, regional and local levels lagged behind so that these structures remained largely unchanged.

At present, the cooperative development paths in the former communist countries are directly tied to legislative frameworks that focus on the ownership of land, property rights and access to financial services. On the other hand, while the traditional co-operative sectors are in decline, newly established co-operatives, such as credit unions, housing co-operatives and agricultural cooperatives have become powerful social tools in the fight against social exclusion and increasing unemployment resulting from the dismantling of the former industrial structures (Borzaga and Spear, 2004, p.34).

3.3. Cooperatives in the Republic of Croatia

Cooperatives have a rich and long tradition in Croatia; they started to develop under the influence of cooperative practice, which came from Europe (Tratnik et al., 2007). The first cooperatives established on Croatian soil 150 years ago were savings and loan cooperatives of the Schulze-Delitzsch¹ type, which operated with limited liability and major cash contributions. The first cooperative of this kind was established in 1864 on the Korčula Island - "Blagajna uzajamne veresije", It marked the beginning of the development of agricultural cooperatives in Croatia (Mataga, 2005). Although this was a savings and loan cooperative, its membership consisted of many farmers. The cooperative movement then expanded and developed in Dalmatia, but also in other Croatian regions.

Cooperatives were powerful economic institutions, but also a movement with an impact on political trends. In spite of a deep agricultural crisis, cooperatives developed and were of great assistance to farmers in the struggle for economic and social viability between the two world wars. After World War II, cooperatives experienced two particularly difficult periods. Collectivization based on the Soviet model was carried out in the late 1940s, whereby cooperatives lost their original properties. After collectivization was abandoned in the early 1950s, cooperatives were established in different industries and they grew stronger. They were followed by cooperative business alliances and savings cooperatives and cooperative banking (Tratnik et al., 2007). "In socialist Yugoslavia, the cooperative was a social and political institution" (Bilić, 2005, p.119) serving the interests of the State, and not the interests of its cooperative members, thus losing its basic cooperative features.

After its declaration of independence and the adoption of the Constitution of the Republic of Croatia, social, political and economic changes occurred and new objectives were set: private ownership, free enterprise and free market, and democratic standards (Tratnik et al., 2007). Changes in legislation also led to changes in agriculture and cooperatives. The once very popular form of association, "the cooperative became unacceptable and suppressed due to excessive comparisons with and reminders of the socialist system" (Bateman and Maleković, 2003, p.20, according to Babić and Račić, 2011, p.307).²

¹Herman Schulze-Delitzsch (1808-1883) was the founder of the German loan cooperatives.

²A historical overview of cooperatives in Croatia is provided by the following authors: Pavličević, 2010; Mataga, 2000; Mataga, 2005; Tratnik, Stracenski and Radinović, 2005. The following authors wrote about modern

In the Republic of Croatia, the Cooperative Act was adopted in 1995; its basic principles are in line with the legislative practice of EU countries. Pursuant to the Cooperative Act 2011 (Article 1) “A cooperative is a voluntary, open, autonomous and independent company managed by its members, who, through their work and other activities or by using its services, on the basis of community and mutual assistance, meet, improve and protect their individual and common economic, social, educational, cultural and other needs and interests and achieve the objectives for which the cooperative was established.”

A cooperative may be established by seven founders at least, who are natural or legal persons with full legal capacity, and each founder makes an initial shareholder’s contribution of an amount of not less than HRK 1,000. They participate on an equal footing in the activities of the cooperative, decide on all essential business matters and profit distribution. In accordance with the Regulations of the cooperative, a part of the profits is retained and invested in the cooperative, but its purpose is not to serve its own interests but to meet the needs of its members, the main objective being to achieve the highest possible benefit for its members.

The agricultural cooperative is defined as a “cooperative, the core business of which is plant production, livestock farming, forestry or hunting, or any related services; i.e. subsidiary activities in agriculture or the production of plants and livestock products and the first-processing products thereof”. The members of the agricultural cooperatives are natural persons engaged in agriculture, i.e. the production of agricultural products (Narodne novine, 2011).

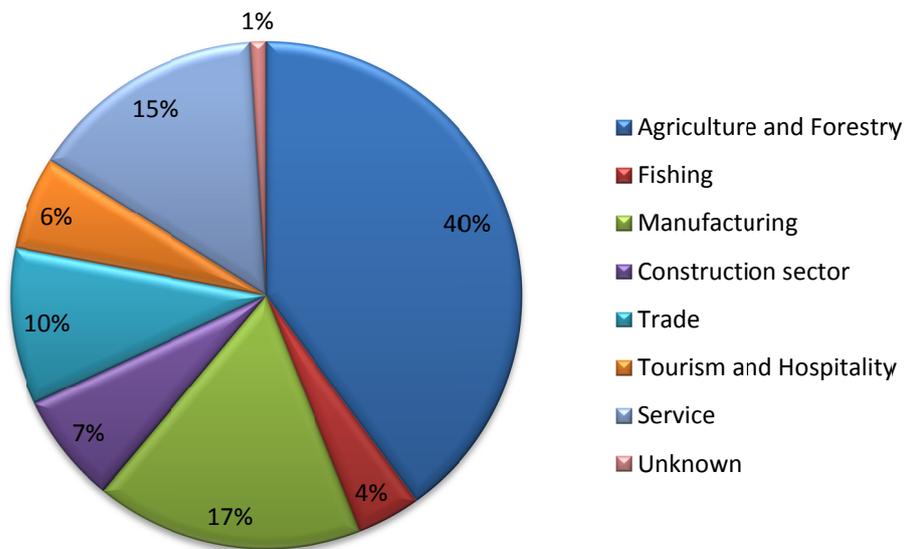
The Croatian Cooperative Alliance, as the main institution of all cooperatives in Croatia, keeps the Records of all cooperatives and cooperative associations. In addition to the Records, it also analyzes the business operations of the cooperatives through their annual financial statements. According to the Records of Cooperatives and Cooperative Associations 1,169 cooperatives with 19,485 cooperative members and 2,734 employees were recorded in 2013. The highest number of cooperatives are in the agricultural sector (Figure 1), which is no surprise in view of the cooperative tradition in Croatia, which is more than 150 years long (Hrvatski savez zadruga, 2013).

In the Republic of Croatia there are 472 agricultural cooperatives, with at least several agricultural cooperatives registered in each of the 20 counties and the City of Zagreb.

The data of the Croatian Cooperative Alliance show that 58% of the cooperatives do not have a single employee. In view of the fact that processing and the operation of cooperatives require a certain number of employees in the cooperatives; this is certainly an obstacle to success for cooperatives wishing to sell their final products on the market (Hrvatski savez zadruga, 2013). The objective of each cooperative is to have as many cooperating manufacturers as possible who sell their products and services through the cooperative. As a consequence, it is also necessary to have a person who will professionally make sure that the cooperative operates legitimately, coordinate the production, sale, collection and other activities, as required for the successful operation of the cooperative as a legal person.

cooperatives in the Republic of Croatia: Babić and Račić, 2011; Mataga, 2009; Sudarić, Zmaić and Sinković, 2008. Cooperative legislation is addressed by Nenadov, Franić and Gugić, 2012, and Matijašević, 2005. The publications of the Croatian Cooperative Alliance, of the International Cooperative Alliance and the International Labor Organization constitute the sources to learn about and analyze changes in the cooperative movement at the global and European levels.

Figure 1. Cooperatives by sector of activity in 2013



Source: Hrvatski savez zadruga (2013) Analiza zadružnog sustava do 31.12.2013., <http://www.zadruga.hr/images/stories/pdf/Analiza%2031.12.2013%20-KONACNO.pdf> [Accessed 20.4.2014]

The overall problems involved in the development of small enterprises, including the lack of knowledge and technology, inadequate sources of finance and rule of law dysfunctions also affect the cooperatives. Cooperatives are frequently joined by micro entrepreneurs who are not competitive enough to operate independently on the market, who are engaged in low-profit activities, or come from rural and/or less developed areas. Certain types of cooperatives are also affected by special problems, such as markets of agricultural products lacking regulation, which makes the operation of agricultural cooperatives more difficult. In comparison with European indicators, there is plenty of room for growth for the sectors of social economy and cooperatives in Croatia. Croatia significantly lags behind, both in terms of number of cooperative members in relation to the total number of inhabitants, and in terms of share of employees in the sectors of cooperatives and social economy.

3. EMPIRICAL RESEARCH

Empirical research was conducted in order to get answers to the following questions: 1) Are there any negative experiences (perceptions) of creating cooperatives in countries in transition? 2) What are the positive and negative experiences of agricultural cooperatives in the Republic of Croatia? and 3) Which state aid measures could encourage Croatian farmers to create cooperatives?

4.1. Research methodology and sample structure

Questionnaires from the World Co-operative Monitor (2013) and the Cooperative Record Sheet of the Croatian Cooperative Alliance (2014) were used to develop the survey questionnaire. The questions were divided into five chapters: 1) general data, 2) social indicators, 3) perception of cooperatives in Croatia as a country in transition, 4) experience-based indicators and 5) aid measures. The survey questionnaire consisted of 35 questions: 11 open-ended questions, 14 close-ended questions and 10 combined questions. The survey was conducted during the period between October 28 and November 20, 2014.

In 2013, there was a total of 472 agricultural cooperatives in the Republic of Croatia (according to the Records of Cooperatives and Cooperative Associations kept by the Croatian Cooperative Alliance). While taking into account an equal representation of counties, 245 cooperatives were selected for the sample, which represents 52% of the total population. The online questionnaire was sent by email. However, 42 of them did not have a valid email address, and of the remaining 203 agricultural cooperatives only 30 returned duly filled in questionnaires.

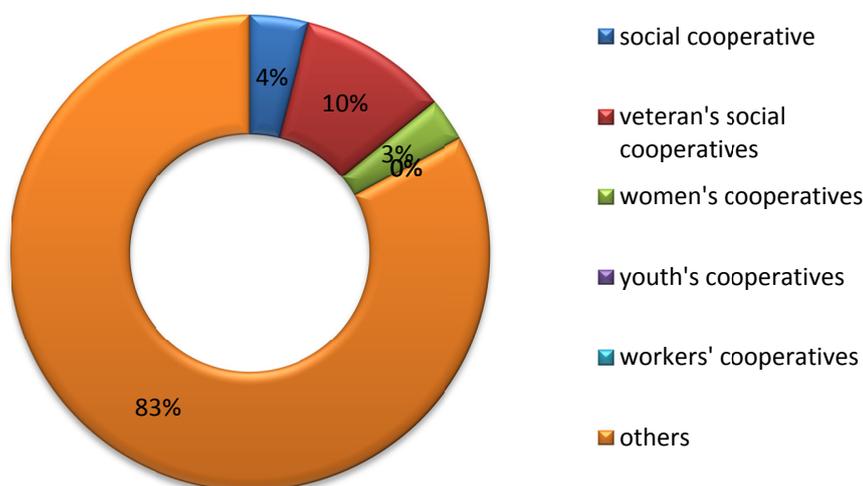
5.2. Research results

Most of these 30 surveyed agricultural cooperatives do not belong to any of the categories of cooperatives defined on the basis of special features (Figure 2). They describe themselves as primarily agricultural cooperatives, i.e. war veterans' cooperatives for production and agriculture.

Most of the cooperatives from this sample are located in the Istria County, although according to the list of agricultural cooperatives in the Republic of Croatia the Istria County has the lowest number of registered agricultural cooperatives compared to other counties.

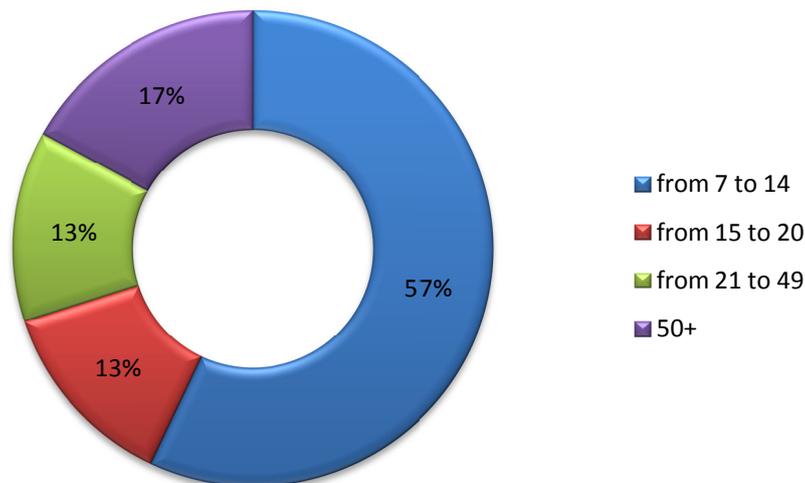
Two thirds of the surveyed cooperatives are members of a territorial and/or professional federation. These are most frequently regional, i.e. county federations of cooperatives and associations of producers, which play the role of intermediary between the cooperative and the market. None of the surveyed cooperatives is member of a European cooperative and/or professional federation. Since most of the cooperatives are not exporters (90%), they do not see the need to join European cooperative and professional federations.

Figure 2. Special features of cooperatives



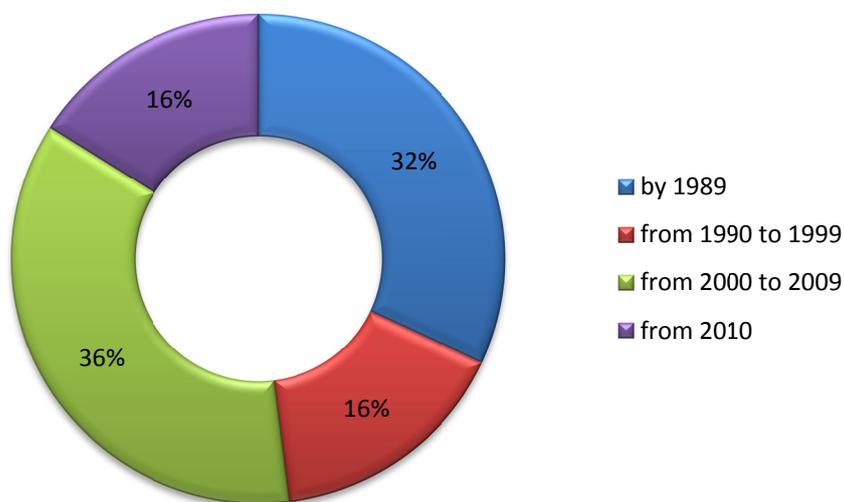
The cooperatives from the sample have between 7 and 14 cooperative members on average (Figure 3), with a secondary school education, and the average age of the cooperative members is 50. Most of the cooperative members are natural persons and males. The average number of employees in the cooperatives is 3 employees per cooperative.

Figure 3. Number of cooperative members



Most of the surveyed cooperatives were established during the period from 2000 to 2009 or by 1989 (Figure 4). Upon the declaration of independence of the Republic of Croatia, more than half of the respondents consider that cooperatives have become an unacceptable and suppressed form of operation, primarily due to a lack of relevant legislative framework and to the legacy of communist past.

Figure 4. Foundation year of the cooperative

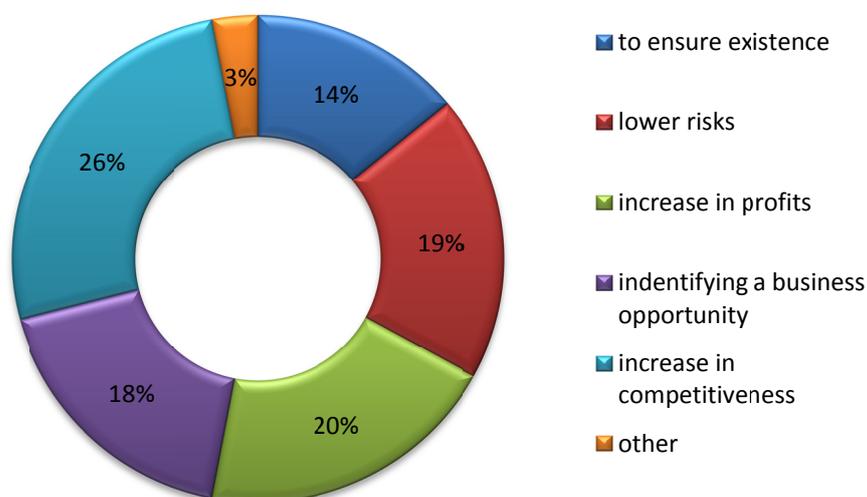


The respondents see the inadequate legislative framework and a lack of aid measures for the business activities as the major obstacles to the development of the cooperative sector in the Republic of Croatia. They also emphasise the absence of quality producers or family agricultural farms willing to create cooperatives, the policy of the State towards the cooperatives and the policy of shopping centres. They also note that certain producers join a cooperative in order to be able to offer their products on the market if they have surpluses that they cannot sell directly.

When asked: “What were the difficulties in changing the entrepreneurs’ mentality towards cooperatives?”, the respondents stated that there were difficulties in the creation of a mentality, i.e. a feeling of trust among cooperative members themselves and belief in common action for the prosperity of the cooperative and their own. More importantly, there was a lack of understanding that without making their own effort they could not expect any assistance from the cooperative. When asked: “What were the difficulties in changing the mentality in public administration structures towards cooperatives?”, the respondents stated that only big systems were trusted and assisted. They also mentioned the insufficient preparation of legislative regulations and the harmonization with the cooperatives of the developed European countries, as well as the governmental structure for the enforcement of the defined frameworks.

As a primary motive to create a cooperative (Figure 5), most cooperatives reported increase in competitiveness and profits, lower risks and identification of a business opportunity. Among the benefits derived from operating a business through a cooperative, the respondents mentioned the easier and more rapid sales of products and cost cutting, higher competitiveness and lower operating risks, more competitive quantities of products and sharing technology and knowledge. As the main drawbacks resulting from operating a business through a cooperative, they mentioned the slow response to changes on the market and the joint management of the cooperative. This is followed by a loss of decision-making autonomy and a loss of autonomy in the quality of their own products, imposition of other people’s ideas and a lack of interest in the growth and development of the cooperative.

Figure 5. Motives to join in a cooperative



The respondents see the main competitive advantage of agricultural cooperatives in the quality of the products, the product price and the flexibility of the agricultural cooperatives themselves. Most of the cooperatives use their own capital as a source of finance. Some use loans from commercial banks, leasing and EU aid and subsidies. Cooperatives are interested in cooperation in the fields of investments in technology, joint ventures, export of cooperative products, certification, and product research and development. They also want cooperation in the fields of marketing and branding of the cooperative products, repurchase of agricultural products as well as tourism and tourism products.

The certificate that the surveyed cooperatives have is mainly the HACCP food safety certificate. A small number of cooperatives have the ISO 9001 quality management system certificate, while none of the surveyed agricultural cooperatives has a Halal and Kosher certificate or an ISO 14001 certificate for environmental protection and sustainability. Among other certificates, the cooperatives mentioned "Croatian Quality", "Croatian Creation" and the "Croatian ECO product" label.

Most of the cooperatives have yet not had the chance to use any aid program as an incentive to cooperative activities, i.e. they used one aid program only - the State aid of the relevant ministries. They are mostly satisfied with the aid program they used. They obtain information on calls for proposals for aid programme funds largely on the Internet, through other media and exchange of information among cooperatives. In the respondents' opinion, the aid programmes that would be useful to their cooperative refer to the funding of projects for the development of cooperatives and for the business operations of cooperatives, either by means of investments in technology and innovations, the modernization of the existing equipment and IT systems or the revival of rural areas and agricultural production.

The conducted survey highlighted the problems and needs related to the development of agricultural cooperatives in the Republic of Croatia, i.e. a cooperative mentality. The results obtained match the theory framework mentioned in the paper, i.e. they confirm them and further explain them.

6. CONCLUSIONS AND RECOMMENDATIONS

Cooperatives and cooperative enterprises constitute an essential part of the European economy. They can contribute to achieving and maintaining the levels of employment, help reduce inequalities, promote fairness and equality and improve the working conditions of their members. However, the potential of cooperatives and joining cooperatives has not been fully used. The "picture" of the cooperatives needs to be improved both on the European and national levels of the member states, especially of those that had a negative experience during the period of the communist regime.

The European post-socialist societies have marked their transition in the previous decade with an orientation towards efficient market management and political democratization. However, the efforts to depoliticize cooperative unions, federations and apex organizations have proved to be a difficult task. Difficulties in changing the entrepreneurs' mentality towards cooperatives and difficulties in changing the mentality in public administration structures indicate an obvious lack of leaders experienced in managing independent, market-oriented cooperatives. And in the transition process, the cooperatives themselves weakened and became fully disoriented due to the lack of a relevant legislative framework.

The historical experience of common activities in in-house cooperatives and the tradition of operating a business through a cooperative constitute the basis for the development of cooperatives in Croatia. The strengthening and awakening of entrepreneurial initiative in small family agricultural farms resulted from the recognition of the importance of joining forces for more efficient sales, lower costs and business risks, higher competitiveness and distinctiveness of the cooperative products and achieving an economy of scale. The market concentration of scattered agricultural farms in terms of production through cooperatives provides at the same time stability and business cooperation for the farms in areas in which they are weak and more bargaining power. The potential of the cooperatives lies in the

creation of common benefits through the cooperative mechanisms to counter low income, insufficiently developed market exchanges and limited social assistance systems.

The overall problems of the development of SME-s in Croatia, including the lack of knowledge and technology, inadequate sources of finance and dysfunctions in the rule of law also affect the cooperatives. Cooperatives are mainly small companies with several varied activities, among which sales and purchasing mainly prevail rather than production and processing. Most cooperatives do not operate on the global market, and the influence of cooperatives on the domestic market also decreases due to the increasingly higher competition of trading companies.

Although there are cooperative aid measures on a national level, funds from aid for this purpose are dislocated and scattered in terms of competences and finance. Such an aid system highlights the need for a systematic approach to cooperatives. The number aid programmes is limited and the activities of the State and local organizations are carried out for the purpose of the foundation, growth and development of cooperatives. Inadequate aid for enterprises cannot be a factor of change. Therefore, it is important to raise awareness of the importance of defining the problems and needs, i.e. defining the demand and shaping the supply in order to develop relevant aid programmes. Aid programmes should, to a great extent, be based on the participation of local self-government authorities. This would be an incentive for small agricultural farms to participate in specific projects, which could motivate and strengthen the agricultural production in the local communities. In other words, emphasis should be placed on the importance of creating cooperatives to achieve a higher level of competitiveness.

Based upon the assessment of the characteristic features and needs of agricultural cooperatives, the following recommendations have been made, which should be of assistance to create a cooperative mentality. The following has been suggested: 1) to adopt a national strategy of development for cooperatives and cooperative associations in the Republic of Croatia, harmonized with the EU key strategic documents; 2) to strengthen the capacity and establish a network of local and national organizations producing a systematic action on the development of cooperatives; 3) to educate and inform the local population and decision-makers at the local and national levels about the advantages of creating cooperatives; 4) to promote cooperatives via examples of good practice, to position the cooperative products and services, to increase the visibility of their activities; 5) to encourage an exchange of experience by organizing conferences, workshops and seminars at the local, regional and national levels; and 6) for the purpose of the development of agricultural cooperatives, it is suggested that they should create a federation of agricultural cooperatives at the national level.

This research was limited in that it was only concerned with the agricultural cooperatives and not with cooperative entrepreneurship in the Republic of Croatia as a whole. Therefore, further surveys of cooperatives in other sectors would help emphasise the social and economic need to create cooperatives, on the one hand, and improve the comprehension and create new aid measures for enterprises, on the other hand.

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SHARED SERVICES AND THEIR IMPACT ON THE EFFICIENCY OF MUNICIPALITIES - EXISTING EXPERIENCES AND OPPORTUNITIES FOR SLOVENIA

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ABSTRACT

Efficient provision or delivery of public services is one of the main goals to be achieved by each local government unit. Shared municipal services in the context of inter-municipal cooperation are one of the possibilities to achieve economies of scale, the other being privatization. Inter-municipal cooperation and shared provision of municipal services create greater efficiency and effectiveness in the provision of such services, while it is easier for municipalities to achieve common goals and solve similar problems. In addition to that, such cooperation can adequately provide public services especially in rural or smaller municipalities where the lack of necessary resources and expertise is often present. Inter-municipal cooperation can also lower transaction costs. Paper has two purposes. First, paper gives the insight into shared municipal services from the scope of inter-municipal cooperation from an economic perspective. Literature review, comparative analysis and critical review show advantages and disadvantages of inter-municipal cooperation and differences and similarities between the countries studied. Second, the paper tries to find out what are the possibilities of this type of services' provision in Slovenia, specifically in the context of municipal utilities. Results of the review of international practices will give examples of good practices that could be applied to the Slovenian framework, where relatively small municipalities prevail, and thus enable transforming the existing practices to increase the efficiency and effectiveness of the provision of municipal services.

1. INTRODUCTION

The basic purpose of the municipalities is to provide local public goods and services for its local inhabitants. When deciding whether to provide services on its own or to outsource the provision of services to the private contractor, municipalities consider transaction costs. Under increasing financial pressures municipalities have to manage their local services and utilities in the most efficient way. Shared municipal services in the context of inter-municipal cooperation are one of the possibilities to lower transaction costs, possibly achieve greater economies of scale, increase efficiency etc., the other being privatization.

The paper focuses on shared municipal services in the context of inter-municipal cooperation as an alternative to privatization of local public services and utilities. From an economic point of view, especially with focus on possible effects on economies of scale, costs reduction and efficiency in provision of local services and utilities, the theoretical overview and comparative analysis between inter-municipal cooperation and privatization is presented. The theoretical part is followed by an overview of international practices in inter-municipal cooperation, as an alternative local public services' delivery mechanism, including Italy, Germany, Czech Republic, Finland and Spain. The countries studied in the paper were chosen on the basis of gained experiences with the utilisation of named principle. Namely, all the selected countries have introduced inter-municipal cooperation already in 1990's or even before. The last part of the paper focuses on the joint provision of municipal services in Slovenia and gives an overview on the challenges and advantages that such services' provision would bring to Slovenian municipalities.

2. INTER-MUNICIPAL COOPERATION AS AN ALTERNATIVE TO PRIVATIZATION

Local governments (municipalities) are facing increased financial pressures. In addition to that, globalization and competition in the markets strongly affect and shape both national and local environment. The financial resources of local governments are becoming increasingly limited and therefore municipalities are even more forced to carefully plan and implement strategies to promote local economic development. It is important for each municipality whether it has an attractive environment for creation of new job positions, a sufficiently educated workforce, research institutions etc. Municipalities themselves, especially smaller municipalities, may have difficulties in providing the appropriate environment that will attract new businesses, new employees and consequently additional taxpayers. The scope of the tasks performed by the municipalities to meet the needs of their local population is increasing, while the resources for the provision of all needed services are decreasing. This requires not just the input and output changes, but also the changed modes of service delivery. By working together and through cooperation, municipalities can pool their capacities and reach their common goals easier and faster (Haver & Airaksinen, 2007, pp. 46-47). Inter-municipal cooperation is aimed to improve efficiency of service delivery, to gain economies of scale and to ease the fiscal constraints (Bel & Warner, 2013, p. 2).

Municipalities tend to strive to meet the needs of their residents when providing services and utilities, but simultaneously they also try to do this in a cost-efficient way. Especially smaller municipalities are often faced with the problem that they are not large enough or do not have sufficient resources in order to effectively and efficiently perform their tasks and are therefore unable to exploit the economies of scale. In this context, amalgamation of municipalities serves as a possible solution, but this process is often not politically feasible. Therefore, as a

possible pragmatic solution inter-municipal cooperation in the performance of certain tasks occurs. With such cooperation they achieve the necessary size and scope of activities and are therefore able to reduce provision costs per unit, which leads to more efficient and rational performance of municipal functions. Smaller municipalities usually cooperate with the goal to reach larger efficiency in public service delivery, in a way that they share the necessary resources to provide these services. In this way the provision of such services is consequently less expensive. Different forms of inter-municipal cooperation are becoming increasingly important in today's globalized world, as the functioning of municipalities and their residents is becoming increasingly interdependent (De Mello & Lago-Peñas, 2012, p. 2, 4; Municipal Cooperation, 2014; Pérez-Lópe, Zafra-Gómez & Prior-Jiménez, 2013, p.7). In general, it should be stressed that the inter-municipal cooperation is much more developed and extended in countries with a longer tradition of democracy. In fact, in the former socialist countries the enforcement of democracy often caused a very fragmented structure of local self-government. But the growing fiscal constraints, combined with the pressures of enhancing the quality requirements, lead to considerable needs for inter-municipal cooperation.

Inter-municipal cooperation does not represent the only possible way of increasing efficiency and reducing the fiscal burden associated with the implementation of tasks. In fact, municipalities can decide for outsourcing its local services or for privatization and in this way reduce costs and increase efficiency. In addition to privatization of local services, municipalities have the option of providing shared municipal services in the context of inter-municipal cooperation, which also represents an opportunity to achieve economies of scale. Inter-municipal cooperation and joint provision of municipal services, compared with privatization, creates greater efficiency and effectiveness in the provision of such services, while municipalities are enabled to achieve common goals and solve similar problems. In addition, this type of cooperation provides an appropriate range of local services, especially in smaller and rural municipalities, which often face with a lack of appropriate resources. In general, inter-municipal cooperation depends primarily on economies of scale, distribution of natural resources, the duplication of the implementation of municipal services etc. (White & Warner, 2014, p. 1; Cigler 1994, p. 39; Hefetz et al, 2012, p. 675).

In fact, inter-municipal cooperation leads to lower transaction costs and often lasting savings as privatization, while the height of the latter depends largely on the very structure of local government and the cost structure of each local service (Bel & Fageda, 2006, p. 13; Frère et al, 2014, p. 1741; Warner & Hefetz, 2002, p. 70). Inter-municipal cooperation can even increase economies of scale in areas such as waste collection or increase economies of density in the activities of water distribution and urban transport (Bel & Fageda, 2008, p. 2-3). Finally, inter-municipal cooperation can help to internalize the negative externalities that arise in the implementation of the tasks of the municipalities, which is especially true in the management of waste water, road maintenance or pollution prevention (White & Warner, 2014, p. 5-6).

3. FORMS AND MOTIVATING FACTORS FOR INTER-MUNICIPAL COOPERATION

Inter-municipal cooperation in the provision of joint or shared municipal services encompasses various forms of cooperation. In Europe, the most common form of cooperation is joint participation/venture in public enterprises or public administration organizations, where the incorporated municipalities share the property and the production of public services. Based on the degree of institutionalization it can be distinguish between formal and

informal forms of cooperation; on the basis of the performance of tasks we can distinguish between operational cooperation and coordination of cooperation; and based on the extent of performing the tasks we can distinguish between cooperation with a single purpose and cooperation with several purposes. Forms of informal inter-municipal cooperation are more common in the United States, whereas in Europe they are not so common (White & Warner, 2014, p. 2-3).

When deciding whether to provide services on its own or to outsource the provision of services to the private contractor, municipalities consider transaction costs. The transaction costs are an important element in making the decision between different alternatives to deliver public services. It is not enough just to compare the financial costs of the capital invested, personnel, and property costs to justify the chosen alternative mechanisms to deliver public services. Also the costs associated with negotiating, monitoring, and enforcing contracts with external vendors, as transaction costs, have to be taken into consideration. The level of transaction costs and the decision of externalizing the service depend on service complexity, asset specificity and the local political environment (Roudrigues et al., 2012. p. 617).

Transaction costs result from bounded rationality and agent opportunism involved in contractual agreements. Bounded rationality is connected to the fact that imperfect contracts are due to the limited rationality of individuals. Such agreements then suffer from necessity of additional costs. The existence of opportunism is related to benefits extension that can be carried out by using methods that are not entirely moral or even not legal. Protection against such practice brings additional costs (Jurčik, 2014, pp. 616-617). External delivery choices can therefore bring higher transaction costs and consequently higher total costs, even though it is believed that larger efficiency of production can be achieved through private production because production costs tend to be lower in the private sector (Roudrigues et al., 2012. p. 617-618).

Privatization of local services will therefore be more common in the provision of services, where transaction costs are not high. In the case of privatization it can happen that a private contractor reduces costs, but at the expense of service quality. Privatization may be preferable to the inter-municipal cooperation in the case when it comes to achieving political benefits (Bel & Fageda, 2008, pp. 3-4). The fact that we can achieve lower transaction costs in the case of inter-municipal cooperation in comparison to privatization is mainly reflected in the desire to achieve common interests and goals of the participating municipalities. This in turn has a positive effect on quality of services, greater efficiency and ability to meet the growing needs of the local population (Bolgherini 2011, p. 6). Definitely, low transaction costs are a prerequisite for the successful provision of joint or shared municipal services (Bel & Warner, 2014, p. 8).

Therefore, the largest motivating factor in the privatization of local services represents the need for cost reductions and the possibility of exploiting economies of scale. These cost advantages of privatization point to the fact that due to higher transaction costs in the municipal own local production of services, such services are best left to the production of private contractors (White & Fageda, 2006, p. 14). With the privatization of local services, the fixed costs can be shared between different geographical units. Given the fact that many local public goods and services, especially those of larger capital intensity, have high fixed costs, and the private contractor can optimize the extent of outsourced production by combining production for several municipalities at the same time. The outsourcer is not

limited to one municipality only, and in this way can spread fixed costs more efficiently (White & Fagenda, 2006, pp. 15-16; White et al., 2014, p. 89).

Predominantly in smaller municipalities, the privatization of local services, despite all above noted advantages, may prove as inefficient choice. First, the availability of private contractors in smaller municipalities is smaller, which basically means fewer opportunities for privatization and increased risk of failure to achieve competition. Second, the transaction costs in small municipalities will not be reduced much due to the privatization. Transaction costs in small municipalities could be even higher with privatization compared to municipal own service provision (White et al., 2014, p. 89-90). In general, the privatization of local services can bring out certain problems and thereby inhibits the decision of municipalities for privatization. One of the disadvantages of privatization is the fact that it is impossible to foresee all the possible events in the future. This applies particularly to the possibility of the existence of information asymmetry. In this context, it refers in particular to the incompleteness of contracts, which means that the private contractors subsequently trigger the requirements to change the terms of the contract which are usually justified by the occurrence of the external cost shocks (White & Fagenda, 2006, p. 17).

Because of the shortcomings of the privatization of municipal services, inter-municipal cooperation in the form of joint provision of services and other municipal functions becomes an alternative. Despite the fact that such cooperation occurs in various forms, there are few key features in common for all forms, which can also be seen as a key motivating factors for deciding on inter-municipal cooperation. The first group of key motivators includes more efficient provision of local services, better quality of services, lower costs and greater administrative efficiency of municipal structures. The second group of motivators can situate the fact that inter-municipal cooperation can be used both in urban and in rural municipalities. The third group of motivators can be classified as opportunities to participate in wide variety of activities and tasks while at the same time the other organizational elements of cooperation, linked to potential differences in competency-power of individual municipalities, are insignificant (Bolgherini, 2011, p. 7). It is also true that the inter-municipal cooperation is reflected as an important element of the European integration process, as the local or municipal level is very close to the population when assessing their needs. This kind of horizontal cooperation covers larger territorial entities in comparison to individual municipalities, which may have an impact on the increasing political power of these entities (Bolgherini 2011, p. 9-10).

4. COMPETENCES, MANAGEMENT AND EFFICIENCY OF INTER-MUNICIPAL COOPERATION

Inter-municipal bodies can be shaped as single-purpose or multi-purpose. Single-purpose bodies undertake only one task and multi-purpose bodies undertake numerous different tasks. Each inter-municipal body possesses specific competences. In practice, countries decide for different options. Some prefer single-purpose, the other multi-purpose bodies, but with possibility also to develop the opposite form, and some countries give the same weight to both forms (CDLR, 2007, pp. 39-40; Wolfe & Nelles, 2009, pp. 10-12).

Inter-municipal functions are transformed or delegated to inter-municipal bodies by municipality or local authority. Therefore, inter-municipal bodies have to be competent to handle the local matters. Competences can also be shared between municipalities and unions of municipalities (example of Finland) or they can be transferred by central government and

municipalities to inter-municipal bodies (example of Bulgaria). The transfer of responsibilities to inter-municipal bodies automatically removes the responsibility from the municipalities in Italy and France, for example. Also in the case of Italy and France, when highly integrated inter-municipal cooperation is utilized, they administratively enlist the competences that certain type of cooperation has to take over (CDLR, 2007, pp. 40-43). Despite the differences between countries in delegating and transferring the responsibilities or competences to inter-municipal bodies, there are some similarities. These areas of similarities in competences include water and waste management, traffic and transport, environmental protection, tourism development, planning decisions, medical services, economic and cultural development etc. (CDLR, 2007, pp. 46).

All forms and areas of inter-municipal cooperation need proper management. Management of such cooperation is based mostly on financial and human resources. Financial autonomy is generally required and fiscal autonomy is usually not granted to inter-municipal cooperation bodies. Their own resources come from grants by member municipalities, central government aid, grants from other sub-national authorities or from the EU funds. Regarding the human resources, inter-municipal bodies can employ public or private staff, depending on whether cooperation is public or private (CDLR, 2007, pp. 51, 53; Wolfe & Nelles, pp. 13-17).

Efficiency of inter-municipal cooperation is very important topic, as one of the reasons of such cooperation is also to achieve greater efficiency and effectiveness in provision of local services. Nevertheless, it is true that the efficiency of cooperation, cost-benefit ratio of cooperation and decision-making capabilities depend predominantly on the area of cooperation. Also different country practices show that such cooperation gives mixed evidence; it is more efficient in some areas and in some countries and less efficient in others (CDLR, 2007, pp. 57-58).

While considering inter-municipal cooperation, municipalities consider potential gains from economies of scale and also technical efficiency. Technically efficient output is provided if it can not be produced with fewer inputs. Scale efficiency is given when municipalities already perform in technically efficient form, so it is not possible to improve the input-output ratio by choosing a different output quantity. This means that technical efficiency depends mostly on municipal incentive and transaction costs, and, in contrast, scale efficiency depends on characteristics of the production process (Blaeschke & Haug, 2014, pp. 1-2).

Efficiency gains from inter-municipal cooperation, as already mentioned, are determined by not just achieving economies of scale and scope, but also by reducing bureaucratic inefficiencies and avoiding large personnel or capital investments. The fact that external provision of municipal services is more technically efficient than internal is associated predominantly on service characteristics, market conditions and bargaining position. As the economies of scale and scope are considered the main driving factor for inter-municipal cooperation, both the contractor municipality and the contracting municipality can benefit from the joint provision of services. This means that the contractor municipality will be able to realize the economies of scale and also improve the degree of capacity utilization. Simultaneously, the contracting municipality is able to reduce the production costs (Blaeschke & Haug, 2014, pp. 5, 10-11).

Inter-municipal cooperation is usually a way for smaller municipalities to achieve economies of scale and scope and therefore increase its technical efficiency. But of course efficiency gains might become smaller if it comes to a decrease in technical efficiency due to rising

agency costs and additional internal transaction costs from organizational complexity. Joint provision of services might require additional decision-making bodies, which weaken transparency and again increase transaction costs (Blaeschke & Haug, 2014, p. 32).

5. AN OVERVIEW OF SELECTED PRACTICES OF INTER-MUNICIPAL COOPERATION

The examples of inter-municipal cooperation in the implementation of joint services can be found in many countries. In general, practice indicates the existence of two different models of inter-municipal cooperation (CDLR, 2007):

- Highly integrated model of inter-municipal cooperation based on a clear legal and formal definition of tasks and financial resources to implement them, with a very extensive and developed state control over cooperation. In practice, such model is observed especially in Mediterranean countries (France, Spain and Portugal).
- Flexible model of inter-municipal co-operation based on free choice of municipalities with regard to partnerships, scope and areas of co-operation. In this model, the state control is rather limited, but mostly things are legally and formally regulated through statutes. This model can be observed in the United Kingdom, Bulgaria, Czech Republic, etc.

In practice, most countries apply the intermediate solutions that cover individual elements of both of the above models. Below, concrete forms and examples of inter-municipal cooperation in selected European countries are presented.

- Italy.
In Italy, forms of inter-municipal cooperation began to emerge already in the 1990s. The possibility of such cooperation was introduced by the law. Inter-municipal cooperation intensively began to develop after 2000; yet the greatest boom occurred in the years 2008-2010. Different forms of inter-municipal cooperation can be found in Italy, such as conventions, agreements, pacts and plans. These are forms of cooperation without legal entity status, most commonly occurring in the social services and health care. In addition, we also find consortia that apply to the oldest form of inter-municipal cooperation in Italy. Consortia are very formalized and institutionalized; they mostly include organizations that provide one type of service, as well as advisory services on several levels. Another form presents the association of municipalities with the purpose of providing certain public services and management of territorial tasks. There are also mountain communities that are functionally quite similar to associations of municipalities (Bolgherini 2011, pp. 10-11).
- Germany.
In Germany, inter-municipal cooperation was introduced in the 1960s and 1970s and is regulated by the Constitution. Similar to Italy, Germany also has various forms of inter-municipal cooperation. The first group includes municipal workers' communities, special labor communities and territorial cooperations (e.g. neighborly partnerships). All of these forms are usually created by public or private contract between municipalities. The second group of forms, which are the most common, includes public agreements or conventions between the municipalities for the provision of public services. These forms do not require the creation of a new administrative apparatus. In addition, this group also includes associations with specific purposes that are legal entities. The third group includes new public authorities, which are the

strongest form of intermunicipal cooperation and requires the establishment of a new public authority with its political and administrative responsibilities and competences (Bolgherini 2011, pp. 13-15).

In this context, a study on relative efficiency and inter-municipal cooperation for the case of the municipal wastewater sector in one of the German state was performed. The results showed that inter-municipal cooperation in wastewater services makes benefit mainly for smaller municipalities. From a technical point of view, most municipalities operate at a relatively scale-efficient level, except small municipalities can reach efficiency gains from scale. Furthermore, when such cooperation is restricted to sewage cleaning, informal forms of cooperation are preferred and make more benefit than the institutionalized ones (Blaeschke & Haug, 2014, pp. 2, 32).

- Czech Republic.

In the Czech Republic inter-municipal cooperation was introduced in the 1990s. In 2000 a new law slightly limited inter-municipal cooperation in terms of determining the permitted forms of cooperation. Today inter-municipal cooperation is widespread in the Czech Republic; most municipalities are involved in various forms of cooperation. Cooperation between municipalities may take the following forms: a contract to perform specific tasks, the creation of voluntary municipal associations and the formation of associations for mutual interests, which are established as legal entities based on the statutory law. Voluntary municipal associations are a special form of legal entities that are established by two or more municipalities, which are not necessarily neighboring municipalities. Each municipality can also be a member of several such associations. The association is founded on the basis of the contract, certified by the municipal councils and all participating municipalities (Swianiewicz 2011, pp. 176-180).

- Finland.

In Finland inter-municipal cooperation is defined by the Law on Local Self-Government, amended in 1995. This Act defines inter-municipal cooperation as very flexible. The most common form of inter-municipal cooperation in Finland is a joint municipal administration. This form is regulated by a separate public law, and has its own administration and finance. Joint municipal administration is based on an agreement that is accepted by all relevant municipal councils. Members of the joint municipal administration are chosen by municipal councils. In addition to this form, municipalities establish joint development organizations; and employ civil servants to provide advisory and other services. Forms of cooperation vary on the degree of institutionalization, scope of activities and organizational forms. Among the already well established forms of cooperation there are emerging new, often experimental forms, such as multi-purpose regional organizations, network organizations (e.g. interlocal agreements), which are closer to informal forms of cooperation. The most common among them is the form of sub-regional contract or sub-regional council. The purpose of this form is a long-term development of the municipal cooperation in a regional context, which could cover a large range of services and other features that are performed jointly (Haver & Airaksinen, 2007, pp. 43-45, 49-50).

- Spain.

In Spain under the National Law from 1985 the municipal governments are responsible for the provision of residential solid waste services. Because the law does

not specify the form of delivering these services, the municipalities are free to engage in inter-municipal cooperation. Usually inter-municipal cooperation does not involve contracting out the service to another government or public agency, but municipal governments engage in cooperation under the joint authority. They can choose private, public or mixed production and delivery (Bel et al., 2014, pp. 86, 91). Table 1 shows forms of municipal production in solid waste collection and water distribution in cooperation at supra-municipal level. Inter-municipal cooperation is more common for solid waste collection (around 29% of all municipalities), but also cooperation in the field of water distribution reached around 25% of all municipalities in 2008. In solid waste collection private production takes the greatest share (51% of municipalities involved in inter-municipal cooperation), while in water distribution public production is more common (almost 62% of municipalities involved in inter-municipal cooperation). Mixed firm production is the least common form of production in both areas of inter-municipal cooperation.

Table 1. Forms of municipal production in solid waste collection and water distribution in cooperation at supra-municipal level in Spain in 2008.

	% of municipalities	
	Solid waste collection	Water distribution
Cooperation at supra-municipal level	29.31	24.36
Private production	51.27	30.08
Public production	38.61	61.65
Mixed firm production	10.13	8.27

Source: Bel & Fagenda, 2008, p. 20.

In the case of Spain, it is seen that privatization is not the only choice for local governments to exploit economies of scale or density. Many local governments prefer to use inter-municipal cooperation rather than privatization to exploit economies of scale and especially small municipalities are able to aggregate demand to achieve a scale of production higher than the minimum efficient one when using inter-municipal cooperation (Bel & Fagenda, 2008, p. 13). Another empirical evidence from Spain shows that the use of inter-municipal cooperation by smaller local governments delivers cost savings, which makes smaller municipalities more efficient. Inter-municipal cooperation usually improves poorer performance in most of the services analyzed. It contributes in general to higher levels of efficiency also during the crisis period (Pérez-López, Zafra-Gómez & Prior, 2015, pp. 11, 22).

6. POSSIBILITIES AND ADVANTAGES OF PROMOTING INTER-MUNICIPAL COOPERATION IN PROVISION OF JOINT MUNICIPAL SERVICES IN SLOVENIA

It should be noted that joint implementation of municipal services is relatively well established in practice of old industrialized countries, while the post-socialist countries encountered this phenomenon a bit later. The reason can largely be attributed to the fact that processes of forced mergers of municipalities during the socialist socio-economic regime led to the situation that democratization fostered pressures to materialize the principles of local self-government also in practice. This in turn led to the formation of, on average, very small municipalities in these countries. With the emergence of fiscal constraints and increasing awareness among citizens regarding the requirements for quality of local public services, the municipalities found themselves under distinct pressure to reduce both the administrative and other operating costs, but at the same time not to affect the quality of services. Consequently,

especially very small municipalities found themselves under particular pressures, due to the inability to exploit economies of scale and limited availability of capacities and competencies. This is why they have relatively limited opportunities to maximize the efficiency of their performance - in fact, these municipalities can, besides to mergers, only exploit the positive effects of inter-municipal cooperation.

In particular, Slovenia is a country with a relatively small-sized municipalities (more than 50% of them have less than 5,000 inhabitants), and the intermediate tier of government (i.e., regions, counties etc.) is missing (Pevcin, 2012). Following the above discussion, this gives a fertile ground to envisage the future potentials and trends of municipal service delivery. Following, the below stated evidence shows the following positive effects of inter-municipal cooperation in the joint provision of services, which should be understood as a relatively good basis for the implementation in Slovenia (Municipal Cooperation, 2014):

- Reducing the administrative costs of operating of the municipalities through cost-sharing for salaries, purchases of material, data processing etc.
- Enabling quicker socio-economic development through joint development initiatives and spatial planning, dividing the costs of setting up business incubators, business and technology parks etc.
- Exploiting economies of scale in collection and disposal of waste through the joint implementation of services and joint financing of investments in the field of water management.
- Cost-sharing in health, education and transport services through sharing the technologies and other resources, as well as with joint organization of activities.

The existing field evidence shows that some sort of transformation is already occurring in the modes of municipal service delivery in Slovenia, as the number of the so-called joint municipal administrative bodies (JMA) is increasing. Namely, since 2007 the number of these bodies has rapidly grown, and currently more than 90 percent of municipalities are members of at least one of these bodies. However, the analysis of tasks performed by these bodies indicates that the vast majority of them are active in the fields of authoritative administrative tasks (Fonda & Žohar, 2015), but there is a lack of bodies focusing on joint public service or utilities delivery. Consequently, this should indicate further possible development, taking into account also the above stated benefits.

7. CONCLUSION

Inter-municipal cooperation and joint provision of municipal services is an alternative to the private provision of services. This kind of cooperation can lower transaction costs, possibly achieve greater economies of scale, increase efficiency etc. The advantages of inter-municipal cooperation can be larger for smaller municipalities, where transaction costs are usually lower in the production of public services in comparison to private production, and they are usually also lacking the availability of private providers. Inter-municipal cooperation is a common form of provision of municipal services in many countries. An overview shows the diversity of forms of cooperation, both within individual country as well as between countries. Cooperation occurs either in simple forms, such as agreements, conventions, plans, communities that do not require the status of a legal entity or establishment of a new administrative apparatus, or either in more formalized and institutionalized forms, such as consortia, associations, joint municipal administration etc. Forms of cooperation vary between countries also depending on their legislation. Slovenia, as a country with a large number of relatively

small financially non-autonomous municipalities, should find big advantages of inter-municipal cooperation as a way to provide municipal services. Therefore, it is necessary to promote such cooperation, and especially municipalities themselves have to realize the benefits and the possibilities of such cooperation. In this way, at least partially, the problem of lack of available human capital, financial and other resources in smaller municipalities could be solved. Another alternative might be the amalgamation of municipalities.

Finally, it should be noted that the topic addressed in this paper has not yet been the subject of a wide-ranging research in Slovenia. Further research on concrete examples of municipal joint delivery of certain local public services and utilities would be necessary and could give useful information to public policy makers and to municipalities, especially how the delivery and management of municipal services and utilities could be improved, which is extremely important during the period of ongoing fiscal constraints.

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INTANGIBLE INVESTMENTS IN EUROPE

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ABSTRACT

This study evaluates intangible capital generated growth in European countries using Eurostat data and intermediate inputs from input-output tables. Organizational investments utilize business service intermediates and ICT investment computer programming, consultancy and information services. The organizational investment share of value added, which is concentrated in Northern and Central Europe, is approximately 12%, a share substantially greater than the R&D investment share of 2%. The investment share of ICT is 4% of the value added. While intangible capital has replaced fixed capital as the most important source of growth, the growth since 2007 has been concentrated in Central Europe. Northern and Central Europe, however, have fared well in R&D investment, and Central Europe has done well in ICT investments in services. Over half of the improvement in labor productivity through increasing intangible capital intensity is due to market restructuring.

1. INTRODUCTION

This paper uses expenditure-based estimates of intangible capital in a growth accounting framework to analyze the new determinants of growth in Europe. How much of labor productivity growth is driven by intangibles that are only partly taken into account in traditional national accounting and which part of this is explained by market restructuring? New economies are shifting to a more general use of intangible investments that have increased at the rate of approximately 5% per year from 1995 to 2010 in Europe, according to Corrado et al. (2014) (CHJI). However, the significance of intangible capital in the euro area is still markedly lower than it is in the US (see Gornig and Schiersch, 2014). It has also been suggested that Europe, as a whole, has missed many of the growth opportunities in ICT investment. Almost all of the digital information success stories recited by those who lecture and speak on the ICT revolution, such as Brynjolfsson et al. (2014), are from the US. A regional approach is an important strategy as the downsizing of fixed investments and a relatively healthier intangible investment climate has left Southern Europe as well as parts of Northern Europe in a difficult position. Much of the earlier stronger growth was the result of the catching up of the frontier economies that invested heavily in tangible capital investments, including the building of infrastructure or the supplying of investment goods for final consumer goods produced in Central Europe.

Corrado et al. (2005), in their pivotal study, originate intangibles from national account data to identify intangible capital producing industries, to proxy branding through advertising expenditures and to proxy organizational capital from management expenditures. Microdata studies, such as Piekkola (2014) and Squicciarini and Le Mouel (2012), recently identified intangible capital-related labor costs from occupational data. In Piekkola (2014), following the EU 7th framework INNODRIVE project 2008-2011, labor costs for intangible capital-related occupations are combined with related intermediate input and fixed capital to establish the value of intangible investments.¹ Piekkola (2014) and Görzig, Piekkola and Riley (2010) utilize the occupational structures of firms and assume that a certain fraction of organizational, R&D and ICT workers are engaged in the production of intangible goods, which also requires the use of intermediate and tangible inputs.

Following the micro-level studies using company-level data, intangibles are also considered to be of three types: organizational capital (OC), research and development (R&D) and information and communications technology (ICT). An increasing number of expenditures for management and marketing must be recognized as organizational intangible investments used in branding, management and head office tasks in multinational firms. An organizational investment is typically firm specific and owned by the firm to a greater extent than other types of intangibles (Youndt, Subramaniam and Snell, 2004; Lev and Radhakrishnan, 2003 and 2005). ICT capital is, in national official statistics, narrowly defined to cover databases and software, while this paper evaluates intangible capital creation from telecommunication services (CPA J61) and computer programming, consultancy and related services and information services (CPA J62-J63).

This study relies on industry-level Eurostat data similar to CHJI from 18 European countries. CHJI uses fixed capital/intermediate input ratios in Eurostat input-output data from 14 countries as a proxy for intermediate inputs from intangible sectors, which are a part of

¹ The INNODRIVE project was financed by the EU 7th Framework Programme, No. 214576, www.innodrive.org.

business services, and transforms that capital into intangible investments in each industry.² The approach herein is somewhat different as it follows the INNODRIVE method, wherein labor, tangible capital and intermediated inputs are considered as the three vital inputs in intangible investments. Each industry's intermediate input from intangible producing sectors (mainly business services) is combined with fixed capital and labor to build each industry's own intangible capital. This requires an estimation of a factor multiplier for use of labor costs and a tangible investment for one unit of intangible intermediate input. The factor multiplier is chosen from the output/factor input combinations that prevail in the intangible capital intermediate producing industries. The same multiplier is applied to each industry. However, R&D expenditures rely on readily available BERD (business enterprise expenditures on research and development) survey data or national R&D investment data (Sweden, Romania, Slovenia). The survey-based R&D expenditures are also recently included in the GDP's of the US and many EU countries in addition to a category titled entertainment, literary and artistic originals.

Several studies, such as Stiroh (2005), have stressed the omitted variable problem resulting from failing to include organizational investment, such as improved workplace practices and firm re-engineering, to explain the large returns obtained in the production function estimates of ICT and R&D. Our results further indicate that intangibles were behind all productivity growth from 2008 to 2011. Nearly half of the intangible investment growth contribution occurred through market restructuring during the financial crises and creative destruction. The debt and financial crises created an unfavorable investment climate according to European Investment Bank (2013), but this did not inhibit substantial creative destruction for the benefit of intangible capital intensive industries.

It is further found that intangible investments contributed significantly to labor productivity growth from 2008 to 2011, at 1.4% for all industries, albeit the growth was concentrated in Central Europe. According to CHJI, intangible investments contributed to the growth from 1995 to 2010, especially in the service industry, which has benefitted countries with large service sectors, such as the UK and Netherlands, at the expense of countries with good manufacturing sectors, such as Germany and France. We consider three regions, Northern, Central and Southern Europe. This study suggests relatively good performance of central European services or northern European services, as well.

Section 2 provides the data and the calculations of intangible capital and growth accounting, and Section 3 presents the relative results. Section 4 discusses the conclusions of the study.

2. INTANGIBLE CAPITAL COMPONENTS AND DATA

This paper evaluates intangible investments from the perspective of purchased inputs from intangible capital-intensive sectors using the Eurostat use tables that have been recently revised to form a country-industry panel with 64 industries (Nace Rev. 2) for the period 2008 to 2011. R&D investment data are obtained from the BERD data for the period 2002 to 2010, while year 2011 is evaluated from 2010 by proxying R&D investment growth for 2010 to 11 according to the intermediate input growth in architectural and engineering services, technical testing and analysis services (CPA M71) and Scientific research and development services (CPA M72). Information and data regarding market values are derived from the EU Industrial RD Investment Scoreboard, which collects data from the top 1000 R&D investors based in

² Intangible creation through consulting services is a fraction of the total expenditures in CPA M69 and M70, and this share was assumed the same across all industries (in each country).

the EU. A previous analysis found that investment scoreboard data complement the BERD data (see Azagra and Grablowitz, 2008). Here, scoreboard data are used to allocate BERD R&D investments into the 64 more detailed 64 industry classes, as they are more specific than those used in the BERD survey. As some of the typical non-market services are excluded, the data cover 3706 industry-year observations from 18 countries for the years 2008 to 2011. Analysis concentrates on private output ignoring public administration and education expenditures and real estate activities. Sufficient input-output and hours worked data are available for 56 industries from 18 European countries.³ Eurostat data cover only 18 industries with hours worked data in the biggest countries France, the UK, Germany and Italy. The 18 industries, however, cover approximately 50% of total private sector value added in these countries.

Organizational capital intermediate inputs are obtained from the EU use tables for services of head offices and management consulting services (CPA M69 and M70), advertising and market research services (CPA M73) and other professional, scientific and technical services and veterinary services (CPA M74 and M75). It is assumed that the ratio of one unit of intermediate input combined with fixed capital and labor to produce one unit of output in these industries prevails in other industries for the use intermediate input from this industry group. The organizational capital factor multiplier indicates that labor and capital costs are needed for one unit of intermediate input from IC capital industries. The same methodology is applied for the intermediate input from ICT investments originating from telecommunication services (CPA J61) and computer programming, consultancy and related services and information services (CPA J62-J63).

Architectural and engineering services, technical testing and analysis services (CPA M71) (part of engineering work that belongs to R&D) are excluded to avoid double representation. According to the industry scoreboard dataset, this sector is an important source of R&D activity and is already accounted for in the BERD data. Furthermore, management costs are not additionally assessed from the labor force survey. Thus, our two major categories - organizational capital and ICT - differ somewhat from the adopted approach developed by Corrado et al. (2005, 2009).

The following table provides the value of the factor multiplier A^{IC} for one unit of intermediate input, which is assessed separately in each of the four regions.

Table 1. Factor multipliers: the use of capital and intermediate inputs for one unit of intermediate input.

Region	Organizational capital			ICT capital		
	Multiplier	Wage	Capital	Multiplier	Wage	Capital
All	1.60	0.56	0.04	1.95	0.85	0.10
Northern Europe	1.83	0.76	0.07	1.88	0.80	0.08
Central Europe	1.58	0.55	0.03	2.21	1.08	0.13
Southern Europe	1.39	0.35	0.04	1.63	0.55	0.08
Southeastern Europe	1.36	0.32	0.04	1.88	0.71	0.17

Note: The multiplier is one plus wage and capital shares.

³ Data include Nace Rev. 2 industries health (Q), creative, arts and entertainment activities (R) and exclude real estate (L), public administration (O), education (P), households as employer (T), extraterrestrial organizations (U), securing and investigation, services to buildings and landscape, and office administrative support (N80-N82).

The average factor multiplier is 1.6 for organizational intermediate input, while the highest factor multiplier is 1.83 in Northern Europe. The average factor multiplier for ICT intermediate input is 1.95, and it is highest in Central Europe. The nominal value of intangible capital investment N_{ijt}^{IC} of type IC for industry i in region j (or country) in year t is given by

$$P_{jt}^N N_{ijt}^{IC} \equiv A_j^{IC} M_{ijt}^{IC} \text{ for } IC = OC, R\&D, ICT \quad (1)$$

where intermediate input costs, M_{ijt}^{IC} , from intangible-producing business sectors are multiplied by a factor multiplier, A_j^{IC} , which is region-specific to obtain total investment expenditures on intangibles. The parameter P_{jt}^N is the investment deflator in business services (Nace 69-74 excluding Nace 71 and Nace 72), which is assumed to represent the deflator for intangible assets in all sectors. The real stock R_{ijt}^{IC} of expenditure-based intangible capital of type IC is given by

$$R_{ijt}^{IC} = R_{ijt-1}^{IC}(1 - \delta_{IC}) + N_{ijt}^{IC}, R_{ij}^{IC}(0) = N_{ij}^{IC}(0) / (\delta_{IC} + g_{IC}), \quad (2)$$

where $N_{ij}^{IC}(0)$ is the initial investment, $R_{ij}^{IC}(0)$ is the initial intangible capital stock, δ_{IC} is the depreciation rate and g_{IC} is the growth of the intangible capital stock of type IC-using the geometric sum formula. To evaluate the initial investment $N_{ij}^{IC}(0)$ starting from 2002, we use the BERD data for R&D or the EU use tables. We then evaluate the intangible investment and, hence, the capital stock prior to 2008 based on how the volume of production has evolved in each industry from 2002 to 2008. Fixed capital investment is derived from the gross fixed capital formation, i.e., equipment, property, industrial buildings. The initial intangible investment is further operationalized as the average investment over the three-year period following the first observation year of 2002. The growth rate of all intangibles g_M to obtain the initial stock is set at 2%, which follows the sample average real output growth rate of organizational and ICT intensive sectors (2.1%) from 2002 to 2008. The depreciation rate for organizational investments is set at 20% because of the longer life cycle in production, but the higher Corrado et al. (2005) depreciation rate of 25% is retained for services. Recent estimates of depreciation from the surveys by Whittard et al. (2009) and Awano et al. (2010) indicate that the appropriate R&D depreciation rate is 15% rather than the 20% figure used in CHS. Finally, ICT investments are assigned a 33% depreciation rate.

In growth accounting, GDP growth is decomposed into multifactor productivity growth and that driven by growth contribution of fixed capital, intangible capital (organizational capital, R&D capital and ICT capital) and labor, all per hours worked, H_t (see Corrado et al., 2014) for details of this method). Aggregating all variables at the aggregate level (country, region or all countries) the total change in value added can be decomposed into

$$\begin{aligned} \Delta \ln(VA_t / H_t) = & \bar{S}_K \Delta \ln(K_t / H_t) + \sum_{IC} \bar{S}_{IC} \Delta \ln(R_t^{IC} / H_t) \\ & + \bar{S}_L \Delta \ln(L_t / H_t) + \Delta \ln MP_t \end{aligned} \quad (3)$$

where VA_t is value added in year t including total intangible capital investment $\sum_{IC} N_t^{IC}$, K_t is fixed capital, R_t^{IC} is intangible capital of type IC, L_t is labor, H_t is hours worked, MP_t is

multifactor productivity (Solow residual) assuming labor augmenting technical change and Δ is the difference operator. The terms in S are rental share-of-asset or labor cost share in aggregate nominal value added, $P_{VA}VA$, where P_{VA} denotes the GDP deflator, over two periods as indicated by \bar{S} . Rental price or user cost is set as a fixed external rate of return at 4% plus depreciation. The growth of each capital asset per hours worked is thus weighted by its value added share (fixed capital value added share is taken as the residual).

Aggregate figures at the country level can be decomposed into industrial level growth showing internal growth within industries and into figures driven by regional shifts in the relative size of the industries, which is referred to as the restructuring (between) effect. The total change can be decomposed into the industrial restructuring (within) and market restructuring effects in accordance with Diewert and Fox (2010) and Hyytinen and Maliranta (2013)⁴:

$$\bar{S}_X \Delta \ln X_t = \sum_{i \in C} \bar{s}_{xit} \Delta \ln x_{it} + \sum_i (\ln \bar{x}_{it} - \ln \bar{X}_t^C) (s_{xit} - s_{xit-1}), \quad (4)$$

where $\bar{s}_{xit} = 0.5(s_{xit} + s_{xit-1})$ is the average two-period value; s_{xit} describes the valued added share of variables K_{it} , R_{it}^{IC} , L_{it} ; $\ln \bar{x}_{it} = 0.5(\ln x_{it} + \ln x_{it-1})$ is the average two-period industrial value of $x_{it} = K_{it} / H_{it}$, R_{it}^{IC} / H_{it} , L_{it} / H_{it} ; and $\ln \bar{X}_t^C = 0.5(\ln X_t^C + \ln X_{t-1}^C)$ is the aggregate average two-period figure for continuing firms (C) for $X_t^C = \sum_{i \in C} x_{it}^C$. The second

term in (4) is the market restructuring (between) effect $\Delta \ln X_t^{\text{restructuring}}$ and includes the industry entry and exit effects such that (4) can be rewritten as:

$$\begin{aligned} \bar{S}_X \Delta \ln X_t &= \Delta \ln X_t^{\text{internal}} + \Delta \ln X_t^{\text{restructuring}}, \text{ where} \\ \Delta \ln X_t^{\text{internal}} &= \sum_{i \in C} \bar{s}_{xit} \Delta \ln x_{it}, \\ \Delta \ln X_t^{\text{restructuring}} &= \Delta \ln X_t - \Delta \ln X_t^{\text{internal}} \\ &= \sum_{i \in C} (\ln \bar{x}_{it} - \ln \bar{X}_t^C) (s_{xit} - s_{xit-1}) + S_{xit}^E (\ln X_t^E - \ln \bar{X}_t^C) \\ &\quad - S_{xit-1}^D (\ln X_{t-1}^D - \ln \bar{X}_{t-1}^C) \end{aligned} \quad (5)$$

The term $\Delta \ln X_t^{\text{internal}}$ denotes the internal change, i.e., the productivity growth within each industry weighted by its value-added share (the first term in (4)). The term $\Delta \ln X_t^{\text{restructuring}}$ denotes the effects arising from market restructuring, where $s_{xit} - s_{xit-1}$ is the change in the value-added share of variables K_{it} , R_{it}^{IC} , and L_{it} in continuing industries. The third and fourth terms denote the part of market restructuring explained by exiting industries denoted by E and entering industries denoted by D , where S_{xt}^D is the share of variables K , R^{IC} , L in entering industries of the total value added in period t and S_{xt-1}^E is the equivalent for exiting industries.

$\ln \bar{X}_t^C$ denotes the aggregate in continuing industries. In industrial level data, as all industries are included in year 2008, entries are zero and exits cover industries where data are missing

⁴ A program for decomposing micro-level sources of labor productivity was provided by Mika Maliranta from ETLA, The Research Institute of the Finnish Economy.

for 2011. Thus, as exits are due to missing industry data, their effects on aggregate growth figures are ignored.

3. RESULTS

Table 2 shows that the overall intangible capital investment is 17.6% (organizational investment 11.7% + ICT investment 3.9% + R&D investment 2.0%). Table A.1 in Appendix A shows that the intangible capital stock represents 72% of the value added (organizational investment 47.1% + ICT investment 11.1% + R&D investment 13.8%). The intangible capital stock is nearly half of the 171% value-added share of fixed tangible capital. Table 2 also presents intangible capital intensity across regions, i.e., the intangibles per unit of value added, where the latter includes investments in intangibles.

Table 2. *Intangible capital investment per value added by region.*

Region	OC capital per value added	ICT capital per value added	R&D capital per value added
Northern Europe	13.0	4.9	2.6
Central Europe	10.8	4.0	3.0
Southern Europe	9.9	2.8	1.3
All	11.7	3.9	2.0

Northern Europe: Nordic countries Denmark, Estonia, Finland, Sweden, Netherland, the UK; Central Europe: Austria, Belgium, Czech Republic, France, Germany, Poland, Slovakia; Southern Europe: Bulgaria, Romania, Greece, Italy, Slovenia, Spain.

Organizational capital is the most significant form of intangible capital, and it is fairly equally distributed across regions with Northern Europe having the highest value added share 13%. Northern and Central Europe, for instance, show high concentrations of R&D capital with Germany (19%), France (18%), Switzerland (13%), Finland (12%) and Sweden (12%) accounting for 74% of all R&D investments in the EU countries. ICT capital intensity decreases as one moves from Northern to Southern Europe such that ICT capital is approximately 2.6% to 3.0% of the value added in Northern and Central Europe and is less than half that in Southern Europe.

Growth accounting is conducted separately for each country in manufacturing, in intangible capital using (IC-using) services and intangible capital producing (IC-producing) services. Infrastructure, mining and construction are ignored in the growth accounting analysis. IC-producing services are defined to cover information and communication (J), scientific and technical activities (M), and arts, entertainment and recreation (R), which account for nearly one-third of all services considered. We aggregate up between effects from intangibles. The study includes Europe as a whole, the three specific regions of Northern, Central, and Southern Europe and the three main industries: manufacturing, IC-using services and IC-producing services. Table 3 presents the results.

Table 3. Growth accounting in Europe 2008-2011.

Area	GDP	Hour	LP	K	K restructuring	L/Hour	L/hour restructuring	OC	R&D	ICT	OC, R&D, ICT restructuring	MP nonIC	MP IC
All	0.6	-0.7	1.3	0.3	-0.3	0.0	-0.1	0.2	0.1	0.3	0.8	0.1	0.0
Manufacturing	-0.3	-3.4	3.0	0.5	-0.1	0.1	0.0	0.4	0.2	0.2	0.4	1.4	
IC-using services	0.5	0.6	0.5	0.2	0.2	0.0	0.0	0.1	0.0	0.3	0.4	-0.8	
IC-producing services	2.3	0.5	1.8	0.4	-0.6	-0.1	0.0	0.1	0.1	0.8	1.0	0.2	
Northern Europe	0.4	-0.5	0.9	0.2	0.5	-0.4	0.1	0.3	0.1	0.2	0.0	0.0	0.0
Central Europe	1.6	-0.3	1.8	0.4	-0.3	0.2	0.0	0.1	0.1	0.5	0.0	0.9	0.0
Southern Europe	-0.7	-1.4	0.6	0.5	-1.4	0.1	0.0	0.2	0.1	0.1	1.8	-0.7	-0.1

Note: Growth rates for GDP (GDP), multifactor productivity (MP), fixed capital (K), labor per hours worked (L/H), hours worked (H), INT=internal growth, RE=restructuring.

The first three columns in Table 3 are the growth of GDP, the hours worked and the labor productivity (LP) for the period 2008 to 2011. The next columns are labor productivity growth explained by internal growth and market restructuring of fixed capital, labor per hours and three types of intangible capital. Outliers are excluded in market restructuring of labor per hours and market structuring of intangibles is considered as a whole. The final two columns are growth contribution of multifactor productivity (MP) by IC-using services (weighted by its value-added share) and growth contribution of MP by other industries, i.e., the difference between total MP growth and MP growth explained by IC-producing services.

Private output grew at a moderate level of 0.6% annually from 2008 to 2011 due to the -0.3% annual GDP decrease in manufacturing. However, the GDP continued to grow in Central Europe at a rate 1.6% and at the highest rate in France 2.5% and Poland 3.1% (see Table A.2 in Appendix A). Hours worked declined by -0.7% per year due to the -3.4% annual decrease in manufacturing. Labor productivity growth rose, on average, 1.3%, and the greatest improvement occurred in Central Europe, with an increase of 1.8%. Growth in labor productivity was greatest in the manufacturing sector.

Labor productivity growth was enhanced by intangible investments. The internal growth in intangible capital improved labor productivity growth by 0.6% and market restructuring by 0.8%. The multifactor productivity growth was positive 0.9% in Central Europe and in manufacturing 1.4%. The multifactor productivity did not improve at all in IC-producing services. The results indicate that intangible investment plays a leading role as it was the only clear positive component of labor productivity growth.

While it was found that market restructuring of intangibles was generally positive, in IC-producing services, this varies by country levels. In Northern Europe, market restructuring of intangibles has resulted in lower labor productivity growth in Denmark and Sweden and increased labor productivity growth in Finland. Further, market restructuring in IC-producing industries has enhanced growth in the central European countries of Austria, Belgium and France, while at the same time, internal growth contributions of ICT capital have been strong in well-performing countries in all services as evidenced by correlations of 0.54 to GDP and 0.4 to labor productivity growth. Thus, ICT capital constitutes the general purpose technology that improves labor productivity growth in all sectors rather than that which leads to fast output growth in IC-producing services. The improvement in labor productivity growth due to internal growth of ICT capital has been greatest, 0.5%, in Central Europe.

Table A.2 in Appendix A indicates that multifactor productivity (MP) growth decreased on average in IC-using services and notably in Estonia, Finland, France, Greece, Poland, Spain and Romania. In manufacturing MP growth decreased by -7.8% in Finland, -3.4% in Belgium and increased by 3.3% in Denmark, 7.2% Estonia and 3.9% in Czech Republic.

The growth of intangible capital per hours worked is, in the next stage, decomposed to that driven by internal growth and market restructuring. Previously, we examined the market restructuring of all individual inputs to total factor productivity growth, while here the focus is only on the shifts between low and high intangible capital-intensive industries. The weights are given by industry hours from aggregate total hours rather than by the input's value-added share. The positive market restructuring effect denotes the intangible capital intensity improvement when intangible capital intensive industries in terms of labor input increase their market share. In Table 4, the analysis is again performed separately for the manufacturing

sector, IC-using services and IC-producing services, and Table A.3 in Appendix A shows the development in the three regions.

Table 4. Intangible investment per hours growth by industry.

	Total	Internal	Restructuring
		Intangibles	
Manufacturing	4.8	3.7	1.1
IC-using services	1.8	2.6	-0.7
IC-producing services	2.5	2.2	0.3
		Organizational investment	
Manufacturing	2.3	1.3	1.0
IC-using services	-0.6	0.3	-0.8
IC-producing services	0.2	0.1	0.1
		ICT investment	
Manufacturing	11.7	10.1	1.5
IC-using services	4.4	4.3	0.1
IC-producing services	5.6	5.3	0.4
		R&D investment	
Manufacturing	5.0	3.8	1.1
IC-using services	-3.3	-0.7	-2.6
IC-producing services	5.5	4.9	0.6
		Labor productivity	
Manufacturing	3.7	3.3	0.4
IC-using services	-0.9	-0.6	-0.3
IC-producing services	0.9	1.1	-0.2

Note: The unbalanced panel due to missing hour data in some industries biases upward the ICT investment figures.

It is observed that intangible capital investment per hours worked has increased over the period, thus confirming the findings of CHJI. Manufacturing has experienced a rapid boost of 11.7% in ICT investment intensity growth, which is especially driven by manufacturing in Central Europe (see Table A.2). On the other hand, ICT investment intensity has increased at half this rate in the service industry, while R&D investment intensity has grown in the manufacturing sector and the IC-producing services. Accordingly, it appears that R&D effort through internal efficiency improvement and greater ICT investment in manufacturing has driven this growth.

Organizational capital intensity growth has been lower than of the average growth of intangible capital investment, and more of this growth has occurred due to market restructuring in manufacturing and IC-producing services. Note that the relative share of market restructuring can be higher because the industry-level approach underestimates the observed market restructuring share when using firm-level data.

4. CONCLUSION

This paper has used the input-output tables accessed from the Eurostat data to measure intangible investment intermediate inputs, and the INNODRIVE method to construct the

related use of fixed capital and labor. Former studies have indicated underinvestment in intangibles in Europe and this study shows that in 2008-2011 period increasing intangible investments have been improving labor productivity growth and hence GDP growth in general. The organizational investment share of value added, which is concentrated in Northern and Central Europe, is approximately 11.4% in Europe, an amount significantly greater than the R&D investment share of 2.0%. Additionally, the ICT investment share is 3.9% of the value added. The notable 17.6% intangible investment share of value added using the novel method adopted explains why the 2% intangible investment growth in manufacturing and IC-producing services and the 1% growth in IC-using services led to a 1.4% growth contribution in labor productivity growth. Without this contribution, i.e., using conventional estimates, labor productivity growth would have decreased in Europe during the period 2008 to 2011 along with the decrease in hours worked. Due to the reduction in hours worked, the intangible capital intensity growth was highest, at 4.8%, in the manufacturing sector and lowest, at approximately 2.5%, in the service industry.

In the period of sluggish growth, intangible capital has been the only source of growth, and driven by market restructuring responsible for over half of the labor productivity growth in Europe. One important finding attributable to this study is thus that nearly half of the improvement in labor productivity through increasing intangible capital intensity is due to market restructuring. Petrin et al. (2012) and Petrin and Srinivasan (2013), among others, indicate that resource reallocation explains over half of the total increase in total factor productivity growth in the US, Chile, Columbia, Slovenia and India. Accordingly, the half rule of market restructuring matches the findings elsewhere with respect to the world economy, although with a different approach since not using resource reallocation of intangibles as the criterion.

Our third finding besides intangible capital driven growth and the importance of market restructuring is that the growth has been concentrated in Central Europe. In this respect, the periphery countries in Southern Europe and, during the financial crises, those in Northern Europe as a whole, which include many small open economies, such as Nordic countries and the Baltic area, are not included in this growth. One explanation can be that multinationals have centralized their functions in Central Europe or within regions. For example, in Nordic countries, this is seen as the centralization of operations in the biggest country with good performance, Sweden, and from there, to the metropolitan Stockholm area. Northern Europe has also experienced a boost in ICT capital-producing industries that are typically concentrated in the largest cities. Thus, the differences in core-periphery regional growth also apply within the countries. Another explanation for the recent phenomenon is that Central Europe relies more on those services that performed relatively better during the 2008 to 2012 period when domestic markets were still supported by public expenditures, i.e., before the 2013 cut in spending.

Finally, the good performance of Central Europe also relates to the wider use of ICT investments in all industries. ICT investments are, foremost, behind the intangible capital-driven labor productivity growth in manufacturing. Moreover, ICT investments have been directed toward general purpose technology that has been used widely in the IC-using industries. However, the ICT capital producing industry has not increased in size to the same degree as it has in Northern Europe. The growth of R&D investments in services has also been notable.

Overall, the analysis shows some positive signs of continuing investments in intangibles, at least until 2011. On the other hand, intangible capital-driven growth is more concentrated in service oriented Central Europe, where manufacturing also offers final goods for consumers rather than intermediate goods for other manufacturing industries. International competition and digitalization leads to competition among many substitutes. In the value chain, companies may specialize in R&D investment by engaging in the designs of new products, or they may use improved organization capacity and ICT to supply new goods and services to the market. The question remains the degree to which this success is due to better access to consumer markets in Europe and worldwide, better integration opportunities for relatively skilled labor in Eastern Europe and the utilization of increasing returns to scale and related extra resources for innovation..

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Appendix A

Table A.1 Summary of intangible capital expenditures.

Variable	Mean	Standard Deviation	Median
Value added (VA) at factor prices excluding intangibles	7,411	15,654	1,902
Organizational capital	4,290	11,060	925
ICT capital	1144	3561	141
R&D capital	1,705	6,911	26.5
Organizational capital/VA	47.1 %	6.8 %	48.2 %
ICT capital/VA	11.1 %	2.7 %	11.3 %
R&D capital/VA	13.8 %	4.3 %	14.2 %
Fixed investment/VA	183.0 %	30.5 %	171.0 %
OC investment/VA	11.3 %	1.9 %	11.6 %
ICT investment/VA	4.0 %	1.0 %	4.2 %
R&D investment/VA	2.4 %	0.7 %	2.7 %
Fixed capital/VA	15.2 %	0.7 %	14.8 %

Table A.2 Growth accounting by country.

Area	GDP	Hour	LP	K	K restructuring	L/Hour	L/hour restructuring	OC	R&D	ICT	OC, ICT, R&D restructuring	MP
All	0.6	-0.7	1.3	0.3	-0.3	0.0	-0.1	0.2	0.1	0.3	0.8	0.1
Manufacturing	-0.3	-3.4	3.0	0.5	-0.1	0.1	0.0	0.4	0.2	0.2	0.4	1.4
IC-using services	0.5	0.6	0.5	0.2	0.2	0.0	0.0	0.1	0.0	0.3	0.4	-0.8
IC-producing services	2.3	0.5	1.8	0.4	-0.6	-0.1	0.0	0.1	0.1	0.8	1.0	0.2
Northern Europe	0.4	-0.5	0.9	0.2	0.5	-0.4	0.1	0.3	0.1	0.2	0.0	0.0
Denmark all	-0.3	-1.8	1.5	0.1	0.2	-0.2	0.0	0.0	0.1	0.3	-0.1	1.1
Manufacturing	-1.2	-6.5	5.3	0.1	0.9	-0.5	0.0	0.2	0.7	0.2	0.4	3.3
IC-using services	0.3	-0.9	1.2	0.0	0.1	-0.2	0.0	0.0	0.0	0.3	-0.2	1.2
IC-producing services	-0.7	-0.3	-0.4	0.0	-0.2	0.0	0.0	-0.2	-0.1	0.4	-0.1	-0.2
Estonia all	-0.3	-3.5	3.2	1.6	0.2	0.6	0.0	0.7	0.1	0.0	0.0	-0.1
Manufacturing	5.6	-4.0	9.7	1.6	-0.3	0.4	0.0	0.9	0.0	0.1	-0.2	7.2
IC-using services	-3.5	-3.7	0.2	1.3	1.1	0.6	0.0	0.7	0.2	0.1	0.0	-3.8
IC-producing services	-1.8	-1.7	-0.1	2.3	-0.8	1.1	0.0	0.4	0.1	-0.3	0.2	-3.1
Finland all	-2.8	-1.8	-1.0	0.5	-0.6	0.6	0.0	0.6	0.2	0.3	0.7	-3.2
Manufacturing	-7.4	-4.3	-3.1	0.7	-1.3	0.8	0.0	0.9	0.9	0.4	2.4	-7.8
IC-using services	-1.0	-0.6	-0.4	0.5	-0.9	0.5	0.0	0.7	0.2	0.1	0.4	-1.9
IC-producing services	1.9	0.3	1.6	0.1	0.5	0.4	0.0	-0.3	-1.0	0.8	-1.7	2.9
Netherlands all	-0.1	-0.3	0.2	0.3	0.4	0.0	0.0	0.2	0.1	0.1	-0.1	-0.7
Manufacturing	0.7	-2.2	2.9	0.5	-0.1	0.0	0.0	0.6	0.1	0.1	-0.2	2.0
IC-using services	0.4	0.0	0.4	0.2	0.4	0.1	0.0	0.1	0.1	0.0	0.0	-0.5
IC-producing services	-1.8	0.0	-1.8	0.2	0.6	-0.3	0.0	0.1	0.2	0.1	0.3	-3.0
Sweden all	1.5	0.6	0.9	0.1	0.2	-1.9	0.0	0.3	0.1	0.1	-0.2	2.2
Manufacturing	0.1	-2.6	2.7	0.1	0.3	-0.2	0.0	0.4	0.3	0.0	-0.3	2.1
IC-using services	1.8	2.2	-0.5	0.1	0.1	-3.4	0.0	0.1	0.0	0.1	0.1	2.4
IC-producing services	2.5	0.5	2.0	0.2	0.2	-0.5	0.0	0.4	-0.1	0.3	0.1	1.4
UK all	1.2	0.8	0.4	0.0	0.4	-0.2	0.0	0.2	0.1	0.2	0.2	-0.6
Manufacturing	-1.5	-2.5	1.0	0.1	1.0	-0.5	0.0	0.4	0.0	0.3	0.1	-0.3
IC-using services	2.0	1.4	0.5	0.0	0.0	0.3	0.0	0.2	0.0	0.2	0.0	-0.1
IC-producing services	2.5	1.9	0.6	0.1	1.3	-0.6	0.0	0.2	0.2	0.2	0.4	-1.2
Central Europe	1.6	-0.3	1.8	0.4	-0.3	0.2	0.0	0.1	0.1	0.5	0.0	0.9

Area	GDP	Hour	LP	K	K restruc- turing	L/Hour	L/hour restruc- turing	OC	R&D	ICT	OC, ICT, R&D restruc- turing	MP
Austria all	0.3	-0.4	0.7	0.3	0.1	0.5	0.0	0.2	0.3	0.1	0.8	-1.7
Manufacturing	-0.6	-2.1	1.5	0.4	0.4	0.4	0.0	0.6	0.5	0.0	0.0	-0.8
IC-using services	0.2	-0.1	0.4	0.3	-0.2	0.6	0.0	0.2	0.1	0.0	0.0	-0.7
IC-producing services	1.8	1.2	0.6	0.1	0.6	0.4	0.0	-0.2	0.8	0.4	2.1	-3.6
Belgium all	2.1	1.0	1.1	0.2	-0.3	0.1	0.0	0.0	0.3	2.2	3.4	-4.7
Manufacturing	-4.0	-2.3	-1.7	0.2	-0.5	0.1	0.0	0.0	0.8	0.2	0.9	-3.4
IC-using services	2.2	2.6	-0.4	0.1	0.0	0.1	0.0	0.2	0.0	0.3	0.0	-1.1
IC-producing services	13.2	0.8	12.4	0.4	-1.8	-0.1	0.0	-0.5	-0.1	8.3	0.6	5.7
Czech Republic all	0.6	-0.8	1.4	0.3	0.0	-0.1	0.0	0.3	-1.8	0.6	-0.9	3.1
Manufacturing	0.3	-2.2	2.5	0.1	-0.1	-0.2	0.0	0.2	-2.1	0.2	-0.9	5.3
IC-using services	0.8	0.1	0.7	0.1	0.2	-0.1	0.0	0.4	-1.8	0.3	-2.3	3.9
IC-producing services	0.6	-0.8	1.4	0.9	-0.6	0.1	0.0	0.4	-1.6	1.5	-1.3	2.1
Switzerland all	2.1	0.5	1.6	0.3	-0.2	0.3	0.0	0.0	0.1	0.5	-0.1	0.7
Manufacturing	0.5	-1.1	1.6	0.1	0.1	0.2	0.0	0.0	0.2	0.3	0.3	0.3
IC-using services	2.0	1.7	0.4	0.1	0.2	0.4	0.0	-0.1	0.0	0.1	-0.1	-0.2
IC-producing services	6.3	-0.9	7.2	0.9	-1.6	0.0	0.0	0.1	0.3	2.0	-0.2	5.7
Germany all	0.9	0.5	0.3	0.1	-0.6	0.1	0.0	0.2	0.2	0.3	-0.4	0.4
Manufacturing	-0.6	-3.2	2.6	0.3	0.6	0.0	0.0	0.6	0.5	0.3	-0.3	0.6
IC-using services	1.4	1.6	-0.2	-0.1	-0.1	0.2	0.0	0.0	0.0	0.0	0.0	-0.2
IC-producing services	1.7	0.5	1.2	0.4	-1.1	0.1	0.0	0.2	0.2	0.7	0.1	0.6
France all	2.5	-1.2	3.7	1.5	0.1	0.2	0.0	0.3	0.2	0.4	0.4	0.6
Manufacturing	6.9	-3.7	10.6	1.2	1.1	0.2	0.0	0.7	0.3	0.3	0.3	6.7
IC-using services	-0.4	-0.1	-0.3	1.8	-0.2	0.2	0.0	0.2	0.1	0.2	-0.2	-2.4
IC-producing services	1.6	1.5	0.1	1.3	0.1	0.2	0.0	-0.1	0.1	1.3	0.8	-3.6
Poland all	3.1	-0.4	3.6	1.0	0.7	-0.1	0.0	0.7	0.0	0.0	0.4	0.8
Manufacturing	7.1	-3.7	10.9	1.2	-0.6	0.0	0.0	0.7	0.1	0.0	0.0	9.6
IC-using services	-1.4	0.8	-2.2	0.9	1.5	-0.1	0.0	0.7	0.0	-0.1	-0.5	-4.5
IC-producing services	4.2	2.8	1.4	0.7	0.7	-0.1	0.0	0.7	0.0	0.1	1.7	-2.3
Slovakia all	-5.1	-1.7	-3.5	1.5	-1.1	-0.3	0.0	0.2	0.0	0.1	0.3	-4.2
Manufacturing	-3.5	-6.4	3.0	2.3	1.9	-0.5	0.0	0.2	0.1	0.0	-0.2	-0.8
IC-using services	-6.3	-0.6	-5.7	1.4	-2.0	-0.4	0.0	0.0	0.0	0.0	0.1	-4.9
IC-producing services	-2.8	-1.8	-1.1	1.2	1.5	-0.2	0.0	1.0	0.0	0.3	0.4	-5.3
Southern	-0.7	-1.4	0.6	0.5	-1.4	0.1	0.0	0.2	0.1	0.1	1.8	-0.8
Greece all	-5.1	-1.7	-3.5	1.5	-1.1	-0.3	0.0	0.2	0.0	0.1	0.3	-4.2
Manufacturing	-3.5	-6.4	3.0	2.3	1.9	-0.5	0.0	0.2	0.1	0.0	-0.2	-0.8
IC-using services	-6.3	-0.6	-5.7	1.4	-2.0	-0.4	0.0	0.0	0.0	0.0	0.1	-4.9
IC-producing services	0.6	-1.5	2.2	1.2	-1.0	-0.1	0.0	0.9	0.0	0.5	0.2	0.5
Spain all	-0.1	-1.7	1.6	0.1	0.9	0.0	0.0	0.3	0.1	0.0	3.2	-3.0
Manufacturing	-1.5	-4.6	3.1	0.6	2.4	-0.4	0.0	0.8	0.2	0.0	0.4	-4.6
IC-using services	-0.4	-1.7	1.3	0.2	1.9	0.2	0.0	0.4	0.2	0.0	1.1	-1.9
IC-producing services	1.9	2.9	-1.0	-0.1	1.6	-0.1	0.0	-0.1	-0.1	0.0	-0.3	-0.1
Italy all	-0.3	-1.4	1.1	0.3	-0.8	0.4	0.0	0.1	0.2	0.2	0.3	0.4
Manufacturing	-1.8	-4.0	2.1	0.1	-0.4	0.6	0.0	0.3	0.4	0.1	0.2	0.8
IC-using services	0.4	0.3	0.1	0.1	0.0	0.2	0.0	0.0	0.0	0.1	0.0	-0.3
IC-producing services	1.5	-0.9	2.5	0.9	-1.3	0.3	0.0	0.0	0.2	0.6	0.4	1.4
Romania all	0.1	-1.0	1.1	2.8	-5.7	-0.1	0.0	0.3	-0.1	0.6	-1.0	4.3
Manufacturing	0.0	-4.0	4.0	6.7	-8.6	-0.1	0.0	0.0	-0.2	0.5	-0.5	6.2
IC-using services	-0.6	1.5	-2.1	-0.1	0.6	-0.1	0.0	1.1	0.0	1.0	0.6	-5.3
IC-producing services	2.1	-4.4	6.5	-0.7	-14.9	0.1	0.0	-0.4	0.1	-0.2	-4.6	27.1
Slovenia all	-0.2	-1.6	1.5	0.0	0.1	0.0	0.0	0.6	0.2	0.2	0.5	-0.1
Manufacturing	-0.7	-5.0	4.4	0.0	0.3	-0.2	0.0	0.8	0.4	0.2	0.6	2.2
IC-using services	-0.8	-0.8	0.0	0.0	-0.1	0.0	0.0	0.6	0.0	0.1	0.0	-0.7
IC-producing services	1.9	2.3	-0.4	-0.2	0.4	0.0	0.0	0.2	0.5	0.4	0.5	-2.1

Growth rates for GDP (GDP), multifactor productivity (MP) and for fixed capital (K), labour per hours worked (L/H), hours worked (H), organizational capital (OC), R&D capital (R&D), ICT capital (ICT). In Spain 31 of 57 industries have only figures for years 2009-2010 and figures for other years are imputed using growth rates in the three industries.

Table A.3 Decomposition of intangible capital intensity by industry and region.

	Total	Inter- nal	Res- truct- uring	Total	Inter- nal	Res- truct- uring	Total	Inter- nal	Res- truct- uring
	Manufacturing			IC-using services			IC-producing services		
Intangibles	4.8	3.7	1.1	1.8	2.6	-0.7	2.5	2.2	0.3
Northern Europe	2.7	2.5	0.2	1.4	2.1	-0.7	-0.1	0.5	-0.6
Central Europe	5.6	4.0	1.6	1.7	2.0	-0.4	2.5	2.5	0.1
Southern Europe	3.2	3.6	-0.4	1.1	1.0	0.1	-1.0	-0.2	-0.8
	Manufacturing			IC-using services			IC-producing services		
Organizational investment	2.3	1.3	1.0	-0.6	0.3	-0.8	0.2	0.1	0.1
Northern Europe	2.6	2.3	0.3	-1.1	-0.3	-0.7	-1.4	-1.0	-0.4
Central Europe	3.7	2.1	1.6	1.2	1.6	-0.4	-1.4	-1.5	0.1
Southern Europe	0.9	1.2	-0.3	-1.5	-0.8	-0.7	-3.1	-1.7	-1.4
	Manufacturing			IC-using services			IC-producing services		
ICT investment	11.7	10.1	1.5	4.4	4.3	0.1	5.6	5.3	0.4
Northern Europe	4.5	4.2	0.4	2.5	2.5	-0.1	1.5	2.3	-0.8
Central Europe	5.3	4.3	0.9	4.6	4.9	-0.3	4.4	4.8	-0.4
Southern Europe	3.0	3.2	-0.2	3.8	2.7	1.1	-5.6	-4.0	-1.6
	Manufacturing			IC-using services			IC-producing services		
R&D investment	5.0	3.8	1.1	-3.3	-0.7	-2.6	5.5	4.9	0.6
Northern Europe	3.1	2.5	0.6				-0.3	-1.2	1.0
Central Europe	9.2	8.0	1.2				5.3	5.5	-0.2
Southern Europe	6.5	4.7	1.8				0.4	-0.2	0.6
	Manufacturing			IC-using services			IC-producing services		
Labor productivity	11.7	10.1	1.5	4.5	4.2	0.4	5.3	4.3	0.9
Northern Europe	-0.2	-0.5	0.3	2.3	2.5	-0.2	1.8	1.8	0.0
Central Europe	1.0	0.7	0.3	4.2	3.5	0.7	1.7	2.0	-0.2
Southern Europe	-2.4	-1.7	-0.7	2.9	3.0	-0.1	-3.3	-2.7	-0.6

Note: Entry and exit of industries within some regions bias the aggregate figures somewhat, especially in ICT investments in manufacturing.

MEASURING INDUSTRIAL ENVIRONMENTAL SUSTAINABILITY WITH A COMPOSITE INDICATOR: EVIDENCE FROM ITALIAN REGIONS

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ABSTRACT

The paper proposes a composite indicator called "industrial environmental sustainability index" (IESI), in order to measure ecological industrial policies through a ranking of the considered observations (i.e. Italian regions).

The index, overcoming the traditional concept of industrial virtuosity - that refers to sustainable performance of an industry - is built considering simultaneously the efforts made by enterprises (as well as industrial districts) and public local bodies in applying an ecosystem approach to the industrial sector.

We propose a methodology following the OECD (2008) one, based on a multivariate analysis using the Principal Component Analysis, which is a useful technique used to determine a composite indicator of ecological industrial virtuosity at a regional level.

The results of our analysis are twofold: obtaining a ranking of Italian regions related to the environmental aspects of the industrial activities and investigating the role played by public and private actors in order to identify weaknesses such as policy recommendations.

1. Introduction

The industrial development is the main cause of the ecosystem alteration and the resources availability (ENEA, 2012).

According to the European Directives (2009/28/EC; 2009/29/EC; 2009/30/EC; 2009/31/EC; 2009/406/EC; 2009/443/EC) the creation of an eco-sustainable system requires a process driven by public and private investments (UNEP, 2011) and a management closely connected to the industrial and environmental policy guidelines:

in line with "European Strategy 2020", the public investments must be influenced by a flexible and dynamic economic policy aimed at the efficient management of the resources (OECD2011).

the private investments must respond to the principles defined by industrial ecology (Frosch, 1992; Garner & Keoleian, 1995; Ayers, 1989; Tibbins, 1992; Allenby 1992), especially by "industrial symbiosis strategy" (Renner, 1947; Ayers, 1989; Chertow 2000), maximizing the collecting of resources from the inside and minimizing waste materials to the outside.

Thus, governance can be seen as a collection of rules, stakeholders' involvement and processes to realize a common goal (Kemp and Martens, 2007). According to Kemp et al. (2005), better governance is a prerequisite for taking steps towards sustainability.

Nevertheless, at the moment the role played by the governance in the process for sustainable industrial development lacks recognition. In particular this is the case regarding the indicators choice to evaluate the impacts of the environmental policies.

In fact, a huge number of environmental indicators, which are used to evaluate the achieved industrial ecology level - as a process with which policies of sustainable development are pursued (Frosch and Gallopoulos, 1989) - are linked to the efficiency concept (Saisana M., Tirantola S. 2002). These indices allow focus on sustainability performance of industry at the facility level, at the inter-firm level, and at the regional or global level, following the systemic approach and the territorial one (Chertow, 2000).

Currently there is no application that considers—as requested by the EU directives— public investments, private ones and a management connected with industrial and environmental policy guidelines.

Then, overcoming the concept of industrial virtuosity, the aim of this paper is to define a composite indicator called "industrial environmental sustainability index" (IESI) - which includes both government institutions and business sector synergies in order to monitor the ecological industrial activities of a Region, by adopting an integrated territorial approach (Wallner, 1998).

The construction of the index will be structured following two integrated steps. The outputs of each step measures: i) the efforts made by enterprises (as well as industrial districts) both in terms of realized investments and management activities; ii) the financial commitment of public local bodies in applying an ecosystem approach to the industrial sector.

Finally, by aggregating the two components we will obtain a composite index, which will be used to obtain a ranking of the considered observations (i.e. Italian regions).

We propose a methodology following the OECD (2008) one, based on multivariate analysis: i) analysis of variables by PCA, so to obtain a "simpler structure of factors"; ii) weighting and aggregation procedure by a factor method, based on the factors score coefficients.

The paper is structured as follows: after presenting a background on the industrial sustainability indicators literature (section 2), information on data and methodology will be provided (section 3), and an empirical test on Italian regions will be performed (section 4). In section 5 the conclusions are drawn.

2. BACKGROUNDS ON INDUSTRIAL SUSTAINABILITY INDICATORS

Industrial ecology operates on three levels (Chertow M.R., 2000):

- within a firm, using tools such as "green" or "full-cost" accounting (Bennett & James, 1998), pollution prevention, and eco-efficiency (Huppel & Ishikawa, 2005);
- across firms/organizations, it implies a cooperation among firms and organizations through resource and information sharing within a single industry sector or across different sectors.
- the enterprises to national or global level through the study of the cycles and the flows. (Ayres, 1989).

On the basis of the continuous process of integration between environment and productive system that are engaged, for each of these levels the concept of industrial ecology involves two types of sustainability: environmental and industrial.

The definition of the environmental sustainability as "maintenance of the natural capital" indicates all the constraints about the four main activities that regulate the human economic subsystem: on the side of the inputs, the use of renewable resources and not; the pollution and the wastes on the side of the outputs (Goodland R., 1995). This approach strengthens international engagements and the ability of the countries to check the environmental aspects in line with national objectives. The OECD (1993) has been the first organization to conceive in the 1989 environmental indicators, usable on an international level.

The industrial sustainability can be defined instead as the adoption of strategies of business and activities that answer to the actual demands of enterprises and shareholders, protecting, sustaining and improving the human and natural resources that will be necessary in the future improvements. (Labuschagne C. et al., 2007, Feng S.F et al.) In this context the concept of sustainability referred to the firm is accompanied by one refers to the product. Beginning from the 1990s different measures of sustainability and metrics of performance have been defined for each of these dimensions, of which the main ones follow:

Table 1: Industrial Ecology Indices

INDUSTRIAL ECOLOGY		
ENVIRONMENTAL SUSTAINABILITY	INDUSTRIAL SUSTAINABILITY	
	PROCESS	PRODUCT
OECD CORE SET	Global Reporting Initiative	OECD TOOLKIT
ESI	Dow Jones Sustainability Index	WALMART'S INDEX
EPI	EMAS, ISO, ECOLABEL	
ECOLOGICAL FOOTPRINT	World Business Council for Sustainable Development (WBCSD)	

Source: our elaboration

All the provided indicators refer to the national territorial level or to a single enterprise except the environmental certifications and the EF that also considers the regional and local level.

In the first cluster, OECD Core Set of environmental indicators is linked to the monitoring of environmental conditions and trends. It includes about 50 indicators, which cover a broad range of environmental issues and economic data to track pressures on the environment and responses by governments, industry and households. (OECD, 2000)

The Environmental Sustainability Index (ESI) is a composite index regarding socio-economic, environmental and institutional indicators that characterize and influence the environmental sustainability on a national level. The indicators allow to compare a series of matters reentering in the following five categories: 1) environmental systems; 2) reduction of

the environmental tensions; 3) reduction of the human vulnerability to the environmental tensions; 4) social and institutional ability; 5) global administration.

The Environmental Performance Index (EPI) is a composite international index, according to which the countries are classified on the basis of the followings environmental matters: 1. the reduction of the environmental tensions on human health 2. the promotion of the vitality of the ecosystem united to the healthy management.

EPI methodology is based on the development performance indicators calculated as a country's distance from a defined target (Yale Center-Columbia University 2014).

With respect to the industrial sustainability, a number of sustainability assessment methodologies exists in practice for evaluating the performance of companies (Ramachandran, 2000).

Probably the most well-known international sustainability performance indicator set is developed by the Global Reporting Initiative. Indicators in GRI belong to two major categories: core and addition. They are categorized according to three dimensions: economy, environment and society. GRI is a voluntary initiative intended to provide a tool for decision making in multi-level processes such as, management, operation, and internal or external stakeholders. GRI initiative gives a standard format of sustainability performance report so that manufacturers can benchmark the performance of their processes (GRI, 2002a; 2002b).

Another worldwide methodology was developed by the World Business Council for Sustainable Development (WBCSD) in 1997, by introducing the eco-efficiency concept (WBCSD, 1999). The framework considers two sustainable dimensions: environmental and social. The considered process indicators are divided into specific activity and general activity for all other activities (World Business Council for Sustainable Development, 1997).

Through the WBCSD, member companies exchange their experiences in implementing eco-efficiency and share their ideas with the business community worldwide.

Dow Jones Sustainability Indexes are used to assess the financial and sustainability performance of the top 10% of the companies in the Dow Jones Global Total Stock Market Index. The assessment is divided into three distinct sections with 12 criteria, covering the economic, environmental and social dimensions and including answers from the questionnaire as well as the results from a media and stakeholder analysis. (Dow Jones Sustainable index, 2006)

The intent of the OECD toolkit is to provide a moderate level of technical expertise for small and medium companies. The focus of the toolkit is on the calculation and interpretation of 18 core indicators of sustainability performance in terms of materials and processes. (Bordt, 2009)

Considering these examples of industrial environmental indices, some difficulties related to our goal arose:

1) The territorial level, that is almost exclusively expressed either with regards to national aggregate or single enterprise;

2) They don't consider the eco-sustainable activity in term of synergy among different actors. These critical elements don't allow a transparent comparison of the performance of various policy alternatives, and facilitate the identification of areas that may require improvement (Bohringer & Jochem, 2007) also by a careful reallocation of resources. (UN, 2003; UNESCO-SCOPE, 2006).

3. MEASURING INDUSTRIAL ENVIRONMENTAL SUSTAINABILITY: A COMPOSITE INDICATOR

Synthesizing the complex phenomenon of industrial sustainable ecology in a single indicator may appear ineffective for the loss of disaggregated information to which the synthesis leads.

Nevertheless, a composite indicator - that is a mathematical aggregation of a set of individual indicators - can measure multidimensional concepts that usually have no common unit of measurement (OECD, 2008).

Considering the limitations and the criticisms emerged from the literature review, we have built our indicator considering the territory as key of connection to realize sustainable policies and strategies of the Industrial Ecology, as hypothesized by Wallner (1998), according to whom, to overcome the inside difficulties in the practical pursuit of the Sustainable Development, the local level must be valorized.

The positive implications that this can produce are also contained in UN (1992; 2001a; 2002) and in EU (Committee of the Regions, 2005; 2007; EU, 2007; 2008a) recommendations, according to which the regional level choice fulfils the need to define an optimal size for successfully implementing sustainable development in terms of geographic staircases (Allenby, 1992; Zilahy and Huisingh 2009). Graymore et al. (2008), besides, contend that the regional level provides the greatest opportunity for local governments to work together with their constituent communities toward sustainable development.

Following these suggestions, the IESI has been calculated using the methodology proposed by OECD (2008) and applied on a lot of cases (Nicoletti et al.2000; Coco and Russo2006; Ercolano and Gaeta, 2012; Ercolano and Romano, 2012) based on the following steps:

- Data selection
- Multivariate analysis, that is used to study the overall structure of the dataset, assesses its suitability and guides subsequent methodological choices;
- Weighting and aggregation procedure.

3.1 Data and Multivariate analysis

The analysis involves 21 Italian regions, according to the availability of recent data (2012) provided by ISTAT and Italian Observatory on industrial district.

For the choice of the variables we try to identify those directly related to policy and company choices in the industrial ecology domain (table 2); more specifically, the selected variables concern all the available responses defined both by local public body to stimulate an enterprise to adopt a virtuous behaviour, and by private subjects to achieve a high or good ecological performance level. Thus, the variables are classified in two further groups: one named "resources", that is referred to investment choices, and the other named "management", that is referred to management activities for environmental sustainability.

Multivariate analysis is carried out using Principal Component Analysis (PCA), that is a useful multivariate technique for transforming a large number of variables in a data set into a smaller and more coherent set of uncorrelated (orthogonal) factors – the principal components (Pearson, 1910; Hotelling, 1933). The principal components account for much of the variance among the set of original variables. Each component is a linear weighed combination of the initial variables.

The PCA is based on two phases. In the first one, the user defines the number of factors – that represent the data and their variance. One of the most commonly used methods of extraction is Kaiser's criterion, or the eigenvalue rule. Under this rule, only those factors to which was associated eigenvalues larger than one and that contribute cumulatively to the explanation of the overall variance by more than 60 %, will be chosen.

Table 2– The Variables

Label	Description	Unit
Enterprises variables		
Resources		
Environm_cert_	Environmental certification achieved by enterprises	n.
R&D_Expend	R&D Expenditure by enterprises	€
BAT_Techn_	BAT technologies adopted by enterprises in industrial districts	n.
Ecolabel_	Ecolabel achieved by enterprises	n.
Environ_cert_projec_	Projects on environmental certification realized by enterprises in industrial districts	n.
Prod_pol_projec_	Projects on product policy realized by enterprises in industrial districts	n.
Renew_energy_	Renewable energy production	n.
Unsp_Financ_Fund_	Unspent Financial Funds by enterprises	%
Management		
Patents_	Patents	n.
Water_infrast_	Water infrastructures managed by enterprises in industrial districts	n.
Waste_infrast_	Waste infrastructures managed by enterprises in industrial districts	n.
Energy_infrast_	Energy infrastructures managed by enterprises in industrial districts	n.
Environm_Services	Environmental services managed by enterprises in industrial districts	n.
Green_tech_	Energy saving and renewable energy technologies adopted by enterprises in industrial districts	n.
Cogener_tech_	Energy saving and cogeneration technologies adopted by enterprises in industrial districts	n.
Public subject variables		
Resources		
R&D_Pub_Expend	R&D Expenditure by Public Administration	€
Pub_incentive_	Public incentives	€
Exp_paid	Expense paid	€
Management		
Law_Ecol_Ind_Area	Regional Law on Ecological Industrial Area	dummy

The second phase consists in the rotation of factors, that is usually used because this procedure allows a better view of the data. The rotation procedure adopted in this work is *Varimax* rotation (Linting *et al.*, 2007; Svedin, 2009), which minimizes the number of variables with high loadings on each factor, and thus simplifying the interpretation of factors. In other words it maximizes loading of individual indicators on individual factors, so to obtain a “simpler structure” of the factors (OECD; 2008).

3.2 Weighting and aggregation (WA) procedure

Indicators should be aggregated and weighted according to the underlying theoretical framework: correlation and compensability issues among indicators need to be considered and either be corrected for or treated as features of the phenomenon that need to be retained in the analysis [OECD, 2008]. Generally, weights can be equally distributed for all indicators, or assigned on the basis of public/expert opinion. This could be not always desirable in circumstances in which a high degree of objectivity and accuracy is required [Ercolano, Romano, 2012].

A number of weighting techniques exist, but in this work we use PCA to group individual indicators according to their degree of correlation. According to the OECD methodology (2008), weights are built up from the matrix of factor loadings after rotation, as the square of factor loadings represents the proportion of the total unit variance of the indicator, which is explained by the factor. The approach consists in: “weighting each detailed indicator according to the proportion of its variance that is explained by the factor it is associated to, while each factor [subdomain] was weighted according to its contribution to the portion of the explained variance in the dataset” [Nicoletti et al.2000].

In this study we adopt a different WA procedure (Antony and Rao, 2007; Hightower, 1978) that is based on the factor score coefficients, also called component scores, which are

estimated using regression method. Factor score are the scores of each case or statistic unit - Italian regions (Reg_) in our example – on each factor. For the j th regions the index value is calculated as follows:

$$I_j = \sum_{k=1}^f \left(\frac{\lambda_k}{\Lambda} \right) * \alpha_k^{x_j} \quad (1)$$

Where:

- I_j represents IESI indicators for each j th region,
- $\alpha_k^{x_j} = \{\alpha_1^{x_j}, \dots, \alpha_f^{x_j}\}$ represent factor scores of each case – x_j – on each f th factor,
- $\lambda_k = \{\lambda_{k1}, \dots, \lambda_{kf}\}$ represent the variance (%) each f th factor explains,
- Λ represents the cumulative explained variance and
- x_j represents the cases.

The indicator measures the sustainability of industrial policy of one case (Reg_) related to the other on a linear scale. Since its value can be positive or negative, a standardization procedure was developed using the Max – min normalization technique:

$$SI_j = \frac{(I_j - \text{Min } I)}{(\text{Max } I - \text{Min } I)} * 100 \quad (2)$$

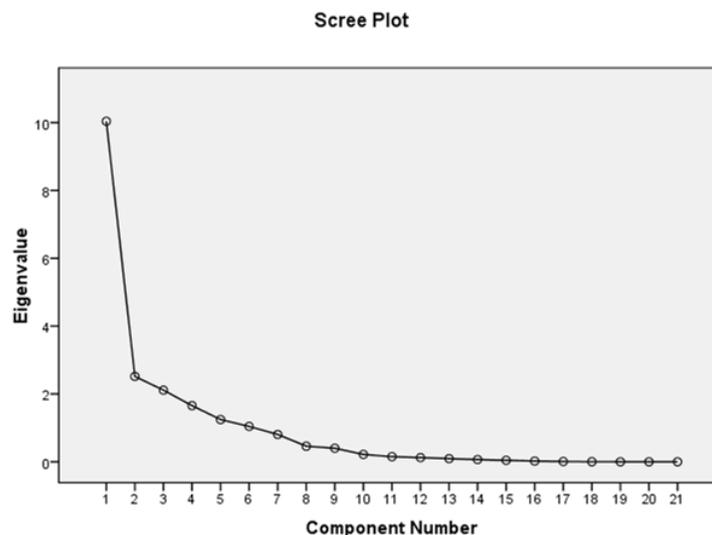
Where SI_j represents standardized IESI indicator for each j th region, $\text{Min } I$ and $\text{Max } I$ are the minimum and maximum value among I_j indicator, respectively.

In this way, the composite indicator value can range from 0 to 100 by making the interpretation easier.

4. EMPIRICAL RESULTS

For the building up of composite indicator – IESI – we consider all of factors that show an eigenvalue larger than one. After examining the scree plot (fig.1), only six factorial axes (subdomains) were extracted for analysis, showing a cumulative variance of more than 88%.

Figure 1 – Screeplot of eigenvalue of factors



Correlation coefficients (loadings) of each variable on each factor - presented in table 2 – are the results of a *Varimax* (orthogonal) rotation, so they naturally range from -1 to +1. Hence, the first factor – it accounts for 47,8% of the total variation – is a reasonable representation of the environmental efforts made by enterprises; the second one – it accounts for 11,9% of the total variation - may be interpreted as a measure of enterprises activity in environmental technology. The third factor, with a 10% of the total variance, represents the activities made by enterprises generated by public subject economic action; the fourth one accounts for 7,8% of the variance, representing fiscal incentives to support sustainability performance in the industrial sector. The last two factors – respectively, account for 5,9% and 4,9% of the variance – they represent the action made by each regional governance, in terms of legislative recognition of ecological industrial areas– factor 5 – and of R&D expenditure – factor 6.

In table 3, IESI values for each region are presented. The first value – S-IESI – is calculated using formula (1) and then (2), in order to give normalized values in a range from 0 to 100. For an easier interpretation of the phenomenon, we consider IESI values compared to the average value, set equal to 100 – A-IESI.

According to IESI values, the rank of Italian regions shows a remarkable difference between North and South. The graph in figure 2 makes the interpretation easier.

The Italian regions that are above average -and show a better environmental sustainability performance in the industrial sector - belong to the Northern area (only Marche is a central region) where there is a long and strong industrial tradition.

However, contrary to what we would have expected, this positive reality represents only 25% of regional distribution (6 regions on 20).

Hence, in the last position, we find a very heterogeneous territorial distribution, with some regions from North and Central areas, and all Southern ones.

Table 3 – *Varimax* rotation factor matrix

Rotated Component Matrix^a

	Component					
	1	2	3	4	5	6
Cert_amb_IMP	,358	,880	,174	,155	-,016	,023
Spesa_RD_IMP	,249	,940	,090	-,073	-,021	,009
Brev_reg_IMP	,379	,843	,230	-,102	-,111	,039
Infr_acq_IMP	,370	,295	-,051	,377	,138	,666
Infr_rif_IMP	,766	,163	,422	,166	,176	,315
Infr_ener_IMP	,753	,424	-,185	,255	,029	,261
Serv_IMP	,553	,220	,272	,574	,266	,283
Tecnol_ee_fer_IMP	,799	,275	,261	-,011	,385	,074
Tecnol_ee_cog_IMP	,672	,387	,255	,225	,174	,298
Tecn_BAT_IMP	,793	,355	,302	,009	,262	,130
Marchi_IMP	,304	,621	-,251	-,200	,409	,281
Prog_Cert_amb_IMP	,929	,062	-,005	,167	,200	-,182
Pol_prod_IMP	,717	,389	,298	,114	,154	-,090
Pol_Clima_IMP	,907	,194	,096	-,026	-,251	-,005
APEA_IMP	,235	-,039	,811	-,017	,470	-,009
Prod_en_fer_IMP	,063	,835	,035	,219	,138	-,183
Spesa_RD_PA	,077	,276	-,069	,291	-,030	-,699
Norm_APEA_PA	,209	,011	,216	-,052	,915	,081
Inc_fondi_no_spe_PA	,066	-,151	-,267	,848	-,062	-,175
Spesa_prev_PA	,141	,163	,376	,788	-,090	,029
Spesa_erog_PA	,248	,251	,892	,054	-,002	,037

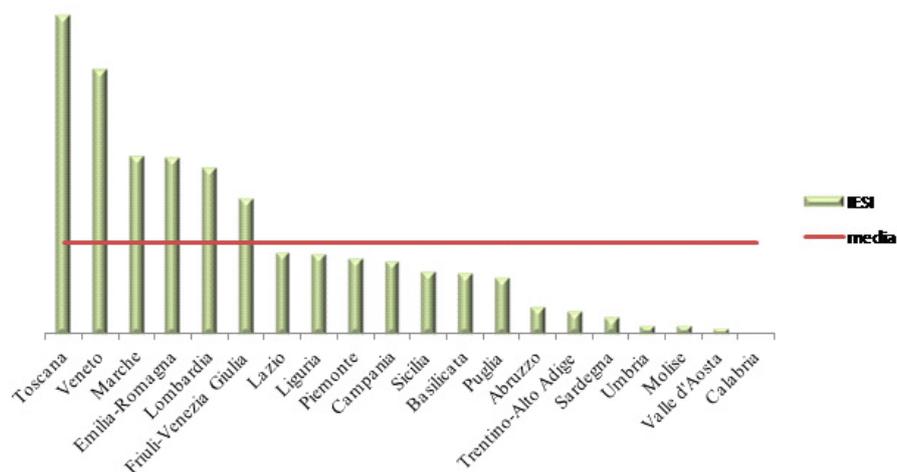
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

Table 4 – IESI Ranking

Rank	Region	S - IESI	A - IESI
1	Toscana	100	348,712
2	Veneto	83,107	289,806
3	Marche	56,053	195,463
4	Emilia-Romagna	55,616	193,941
5	Lombardia	52,333	182,492
6	Friuli-Venezia Giulia	42,731	149,008
7	Lazio	25,610	89,305
8	Liguria	25,211	87,915
9	Piemonte	23,961	83,555
10	Campania	22,827	79,599
11	Sicilia	19,723	68,776
12	Basilicata	19,387	67,605
13	Puglia	17,834	62,191
14	Abruzzo	8,637	30,118
15	Trentino-Alto Adige	7,507	26,176
16	Sardegna	5,669	19,768
17	Umbria	2,814	9,814
18	Molise	2,752	9,595
19	Valle d'Aosta	1,767	6,162
20	Calabria	0,00	0,00

Figure 2 – IESI - region rank and average value



In order to obtain more information about the efforts by public and private subjects in the Ecological Industrial domain, we have calculated regional IESI for enterprises and for public bodies, using our WA procedure with standardization (1) and (2).

In particular, from the PCA results, we can assume the first three factors axes focus on enterprises activities in industrial ecology domain, while the other three focus on public body activities. Then, we calculated IESI_IMP – for the private subjects – by considering only the factor scores of each cases (Reg_) on the first three factors; the IESI_PA – for public subjects – is based on the factor scores on the last factors axes.

This disaggregated analysis shows that in the regions with better IESI values there is a strong synergy between public and private action. Toscana, Marche and Emilia – Romagna present

an almost equal percentage of enterprises and local body efforts – almost 50% each. Only in Veneto and Lombardia the sustainable performance in industrial sector is mainly the result of the strategy of the enterprises.

The worst regions show high percentage of public component. It means that in Southern regions public support is very important in order to achieve environmental sustainability target, even if the position in the ranking shows the inefficiency of these policies.

Table 5 – IESI value for enterprises and public body, and their percentage

Rank	Regions	%	
		SI IMP	SI PA
1	Toscana	0,47	0,53
2	Veneto	1,00	0,00
3	Marche	0,49	0,51
4	Emilia-Romagna	0,49	0,51
5	Lombardia	0,61	0,39
6	Friuli-Venezia Giulia	0,52	0,48
7	Lazio	0,48	0,52
8	Liguria	0,34	0,66
9	Piemonte	0,27	0,73
10	Campania	0,24	0,76
11	Sicilia	0,14	0,86
12	Basilicata	0,30	0,70
13	Puglia	0,23	0,77
14	Abruzzo	0,31	0,69
15	Trentino-Alto Adige	0,34	0,66
16	Sardegna	0,20	0,80
17	Umbria	0,11	0,89
18	Molise	0,11	0,89
19	Valle d'Aosta	0,19	0,81
20	Calabria	0	100

5. CONCLUSION

The conversion of industrial areas implemented through green investments in renewable energy is taking more emphasis in the context of industrial ecology. We have tried to analyze and assess this complex phenomenon using a single indicator; this may appear ineffective for the loss of disaggregated information to which the synthesis leads, but we have demonstrated that it can offer important insights on the development of environmental policies in order to define guidelines for the policy makers.

In the methodology procedure we have tested, the choice of data and the right territorial level is crucial for a correct definition of a certain phenomenon: obviously the same phenomenon could be represented by several indicators, taking into account taking into account the availability of data of statistical units considered (Ercolano and Romano, 2012). Indicators may be seen as pointers which, used effectively, may reveal conditions and trends that help in development planning and decision-making (Tschirley, 1996). Also, indicators can assess the performance of economic and ecological systems (and their change over time) and help set policy goals with regard to sustainable development (Lancker and Nijkamp, 2000). According to Nijkamp and Ouwensloot (1998) an indicator may be conceived as a partial but

representative mapping of a compound attribute of a phenomenon under study into a one-dimensional measure, which has a relevance for policy-making.

This paper has developed a theoretical framework to underpin the construction of a composite indicator, and through this presented a clear picture of environmental sustainability in the industrial sector in each Italian region. Its relevance consists not only in its purpose, but also in the methodology that has been used: the multivariate analysis and PCA in particular, which overcome common problems related to the choice of weights.

After having obtained the ranking of the regions that basically divided Italy in two groups – sustainable industrial regions and not-sustainable ones, we investigated the determinants of this situation that can be used to measure that can be used to measure the efficiency of public and private action.

The results of this analysis can allow to understand that the industrial sector in Italy needs to be “structurally and environmentally” improved in terms of a better allocation of public and private economic resources

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EQUIPMENT AND EFFECTIVENESS OF THE USE OF FIXED ASSETS IN ECONOMICALLY WEAK AND STRONG FARMS IN SELECTED COUNTRIES OF CENTRAL AND EASTERN EUROPE

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ABSTRACT

The article presents the effectiveness of the use of fixed assets in economically weak and strong farms in eight countries of Central and Eastern Europe on average in 2010-2012. The data have been obtained from the EU farm survey conducted under FADN. The aim of the study was to evaluate the differences in the technical equipment of economically strong and weak farms in comparison to the achieved performance. A common feature of economically weak and strong farms was the predominance of fixed assets in the property of agricultural holdings. However, this indicator was more unfavourable in the first group of farms (apart from Bulgaria). The efficiency of use of total assets in economically weak farms in most countries was lower – as compared to the economically strong ones – the difference ranged from 33.3% in Latvia to 57.1% in Slovenia. The efficiency of use of buildings and machinery was also lower – from 8.5 in Bulgaria to 57.1% in Romania. In consequence, the efficiency of the conducted production was worse.

1. INTRODUCTION

When managing a farm, a farmer must make decisions about what to produce, how much to produce and how to produce. The level and structure of production are determined – apart from the climate and soil conditions – also by the farmer's experience and farm's technical work equipment. An appropriate choice of agricultural machinery and equipment and their rational utilisation has an impact on the economic performance of agricultural holdings. It also makes it possible to increase productivity and reduce the burden for the people working on a farm. Unfortunately, it also has a negative characteristic: technical equipment is expensive to buy and to use as well. Therefore, it is a significant capital expenditure, and subsequently a cost carrier, both for fixed and variable costs. Therefore, the utilisation level for technical work equipment in the production process can determine the competitiveness of a farm.

According to numerous authors (Kowalski and Szeląg, 2006; Mróz, 2006; Zajac et al., 2006), who conducted research on the equipment consisting of machinery and tools in Polish farms, the current equipment leaves much to be desired, mainly because of the poor technical condition resulting from many years of utilisation, which is often inappropriate. It is only the quantitative equipment that can be satisfactory. However, in many cases, the machines owned by farmers could be called "aged". The life of such equipment has been prolonged for over 20 or even 30 years, it often includes machinery and tractors purchased in the 1980s. According to Morgan (1993), the machines that are about 15 years old, and sometimes even the 10-year-old ones, are already obsolete in terms of numerous design solutions. Therefore, they are not able to meet the current agri-technical and economic requirements.

Currently, in the conditions of market economy, some farmers can not afford to buy new machinery and equipment, and hence acquire the used equipment, most often imported one. As a result, they replace the more obsolete machinery with a slightly less obsolete one. It is disadvantageous because they often purchase high-power tractors and combine harvesters (mainly for cereals) that are used only for their own needs (Szuk, 2006).

The factor that determines the unit cost of operation of each machine is the time of its use during the year. The research shows that the annual use of machines in many agricultural holdings in Poland represents about 2/3 of the normative use (Kowalik and Grześ, 2006).

The research conducted by the Institute for Building, Mechanisation and Electrification of Agriculture showed that in the conditions of considerable fragmentation of the Polish agriculture, it is not possible to fully exploit the available potential of most types of mechanisation. The operating efficiency of most machines amounts to 50-70% of the productive efficiency and depends, *inter alia*, on the machine operating parameters (speed, working width), proper organisation of work, the size of the fields and their distance from the farm (Komarnicki et al., 2012).

According to Pawlak [2005] in Poland in the eight-year period (1996-2004), the average use of tractors decreased by 20.8%, for combine harvesters by 20.2%, but the use of self-propelled forage harvesters increased (15.4%).

These results prove that the intensity of use of means of mechanisation in Polish agriculture is far from the level considered reasonable. This results in increased costs, reduced profitability of production and financial problems of some agricultural holdings. When planning modernisation, one should bear in mind that the purchase of machinery and tractors involves

capital invested for many years. Besides, a high indicator of capital saturation of land is not always beneficial, it can be a sign of over-investment, which leads to reduced efficiency of production (Skarzyńska et al., 2013).

In order to obtain beneficial economic effects and competitive advantage, management decisions of farm managers should lead managers to optimisation of the use of working capital and fixed assets. Increasing machine use level and the related increase in the value of capital per employee and the implementation of new technologies make the right decisions require increasing knowledge (Kay et al., 2012). Unfortunately, as indicated by the researchers, one of the weaknesses of agriculture in the countries of Central and Eastern Europe is associated with the lack of appropriate qualifications and management skills of farm managers (Baum and Weingarten, 2004).

The research by Veveris et al. (2007) shows that unfavourable capital structure, combined with the expected increase in cost-intensity of production, might lead to a significant decline in competitiveness of economically very small and small farms in the coming years. The efforts of farmers should be primarily aimed at more efficient use of resources in their possession.

Modernisation of agricultural holdings has always been an important objective of the Common Agricultural Policy. Today, the challenge is to ensure that the modernisation will support farmers in achieving economic competitiveness and in the use of environmentally friendly technologies (European Commission, 2012).

Due to the fact that knowledge on the technical equipment of farms is important, this article presents selected issues associated with this subject. The research problem was considered from two perspectives: from the point of view of the research conducted on the basis of a random sample of Polish farms and from the point of view of the research on the farms operating within the territory of the EU.

The results of Polish agricultural holdings in terms of technical equipment constituted a reason to start research on a larger scale, i.e. in selected countries of Central and Eastern Europe. The aim of the study was to evaluate the differences in the technical equipment of economically weak and strong farms in comparison to the performance of such farms.

The article is organised as follows. After the introduction to the research subject, the chapter entitled Materials and Methods presents the data sources and methods that were used in the analysis of results. The chapter entitled Results and Discussion contains the results of the tests and their synthetic analysis. The last chapter of the article – Conclusions – presents the main conclusions arising from the conducted research.

2. MATERIALS AND METHODS

The sample of Polish farms, which were evaluated in terms of technical equipment, was made up of farms that were randomly selected from the sample of farms that managed their agricultural accounting in 2006-2012 in FADN (Farm Accountancy Data Network). A total of 2,650 farms were chosen in the period selected for the research¹. In order to achieve the

¹ The sample covered was almost 1/5 of the population of farms surveyed under the FADN system in Poland. 300-400 farms participated in the survey in each year in the 2006-2012 period. The surveys covered a period of seven years because of the fact that farms change their technical equipment.

objective of the research, i.e. to assess the differences in technical equipment (machinery, technical devices and buildings with their permanent equipment) groups were identified from the sample on the basis of two criteria.

The first criterion was the economic size of farms (expressed in thousands euro Standard Output (SO))². Two groups were identified from the sample of 2,650 farms, and they were defined as economically weak and economically strong farms. The agricultural holdings that belonged to the class of very small and small farms in the ES6 classification were recognised as economically weak ones. On the other hand, the farms belonging to the class of medium-large and large farms were considered economically strong ones. The second criterion for the selection of farms was the share of crop production and animal production in the structure of the total production value of farms. It should be pointed out that the results of agricultural holdings repeated in the survey years were averaged.

As a result, the sample consisted of 647 farms, which were predominantly economically weak farms (they accounted for nearly 60%). In the group with predominantly plant production (as evidenced by its share of over 50%), there were 310 economically weak farms and 206 economically strong farms. On the other hand, in the group with predominantly animal production, there were 77 economically weak farms and 54 economically strong farms.

For all farms in the sample we calculated the indicators to reflect: (1) the machine use level of farms – it is expressed by the value of machinery and technical equipment per 1 ha of Utilised Agricultural Area (UAA); (2) the farm equipment consisting of buildings and their permanent equipment – it is expressed by their value converted to 1 ha of UAA. Subsequently, the assessment covered the significance of differences in terms of the values of such indicators in economically weak and strong farms. The non-parametric Mann-Whitney U Test was used in the research (Aczel, 2006).

In the literature, the hypotheses of this test assume the following form:

H0: the samples come from populations with the same distribution,

H1: the samples come from populations with different distributions.

In practice, the null hypothesis assumes the equality of medians or averages of two populations. On the other hand, the alternative hypothesis informs that there are significant differences in the size of these parameters. In the case of the research on the differences between the two groups, the test procedure requires the two groups to be structured jointly by the size of the examined characteristic. Afterwards, ranks from 1 to n (the size of the entire sample) are allocated to consecutive observations. On this basis, the U statistic is calculated:

$$U = n_1 n_2 + \frac{n_1(n_1 + 1)}{2} - R_1$$

The sum of ranks for the observations from the first group is assumed as R_1 , whereas n_1 and n_2 is the size of the first and second groups respectively. The group sizes in the conducted research were relatively large. In such a case, the U statistic coincides with a normal distribution. In such

² In 2006-2009, ESU (European Size Unit) was the measure of the size of agricultural holdings in the EU. Since 2010, the measure has been SO (Standard Output, expressed in thousands euro). Therefore, in case of farms participating in FADN surveys before 2010, their economic size unit in ESUs has been converted and expressed in thousands euro SOs.

a situation, another test statistics could be used, which, after the appropriate mathematical transformations, assumes the following form:

$$Z = \frac{U - \frac{n_1 n_2}{2}}{\sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}}$$

Bearing in mind that the Z statistic has a normal distribution, the p-value has been calculated for the test used (Mann-Whitney U Test). If the p-value is lower than the assumed level of significance ($\alpha = 0.05$), there are grounds to reject the null hypothesis in favour of the alternative hypothesis. This means that the examined groups differ in a statistically significant way in terms of the size of the examined characteristics. Therefore, it is possible to determine in which group the sizes of the examined characteristic are significantly higher. This is indicated by the average value of ranks for each group.

The conducted research evaluated the technical equipment of economically strong and weak farms in selected countries of Central and Eastern Europe. For this purpose EU FADN data were used (Farm Accountancy..., 2015). The most up-to-date and available data, i.e. the ones for 2010-2012, were used for the analysis.

The research covered economically weak and strong farms in eight countries of Central and Eastern Europe, namely Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovenia. The rationale to choose them was the fact that in the total number of agricultural holdings covered by the FADN survey there were mostly economically very small and small farms (i.e. economically weak). An additional criterion involved similar conditions for the conduct of agricultural production and a similar date of joining the EU (Skarżyńska et al., 2014).

The results of economically weak and strong farms are presented in tabular form. Individual items should be interpreted as average results jointly for two economic size classes. In the case of economically weak farms, they are the average results jointly for very small and small farms, and in the case of economically strong farms – for medium-large and large ones. This means that the calculations included the number of farms comprising each size class. The study used a horizontal analysis, by comparing the parameters characterising the economically weak and strong farms in individual countries.

The evaluation covered farm resources, i.e. the Utilised Agricultural Area (UAA), labour resources expressed as the number of Annual Work Units (AWU) and the total assets.

When evaluating farm equipment consisting of technical means, land utilities and labour infrastructure were evaluated, which are expressed by the ratio of the value of machinery and technical equipment to the utilised agricultural area and the number of annual work units (AWU). Besides, the land and labour burden value has been defined by means of the value of owned buildings with their permanent equipment. The depreciation cost is the measure of consumption of fixed assets in the production process, and it is presented in relation to the total costs of farms.

The efficiency of use of technical means in economically weak and strong farms is expressed by the ratio of production value to total assets and to the value of machinery and buildings considered jointly. On the other hand, the cost of producing production worth EUR 1 was the measure of the efficiency of production.

3. RESULTS AND DISCUSSION

3.1. Equipment consisting of fixed assets in the surveyed farms in Poland

In order to show the diversity of Polish farm equipment consisting of technical machinery, devices and buildings with their permanent equipment, economically weak and economically strong farms were isolated from the research sample. Their equipment consisting of fixed assets was analysed in two groups, i.e. in agricultural holdings with predominantly crop production and animal production in the value structure of farm production. In the case of the surveyed farms, one can see the following relationship: with the increase in economic size, the utilised agricultural area increased as well. The UAA in strong farms in comparison with the economically weak farms with predominantly crop production was 7.7-fold higher, and in the ones with mainly animal production it was 4.7-fold higher (Table 1).

Table 1. Selected data describing Polish farms on average in 2006-2012

Specification	Utilised agricultural area (UAA) in farms economically		Structure of production value in total, of which:				Per 1 ha of UAA			
			crop production in farms economically		animal production in farms economically		Machinery and technical equipment in farms economically		Buildings and fixed equipment in farms economically	
	weak	strong	weak	strong	weak	strong	weak	strong	weak	strong
	(ha)		(%)		(%)		(PLN)		(PLN)	
Farms with a predominance of crop production	20.27	155.19	56.84	65.07	41.55	34.08	4692	4091	7178	3045
Farms with a predominance of animal production	18.24	86.57	40.30	14.32	58.14	85.28	5319	7852	8838	8533

Source: Own compilation based on Polish FADN.

The results indicate the differences in the burden on land of farms by the value of owned machinery and buildings. In the case of farms with predominantly crop production, there were more land utilities in economically weak farms (14.7%), whereas in the farms with mainly animal production, there were more land utilities in economically strong farms (47.6%). As far as the burden on land by the value of buildings is concerned, it was higher in economically weak farms predominantly with crop production by 135.7%, whereas in the ones with mainly animal production by 3.6% (Table 1).

Mann-Whitney U test results for farms with predominantly crop production showed that in the case of their increasing machine use level (the value of machinery and technical equipment per 1 ha of UAA), it can not be concluded that the difference between economically weak and strong farms is statistically significant, which is evidenced by the p-value > 0.05. On the other hand, the difference in terms of burden on 1 ha of UAA by the building value between economically weak and strong farms was statistically significant. On the basis of the average of ranks, the direction of the relationship has been read. The test results showed that the value of buildings and structures per 1 ha of UAA is significantly higher in economically weak farms (Table 2).

Table 2. Results of the Mann-Whitney U test for selected indicators of farms with mainly crop production

Specification	The average of the ranks in farms economically		Statistic U	Statistic Z	p-value
	weak	strong			
Machinery and technical equipment per 1 ha of UAA	264.12	250.05	30189	-1.050	0.293896
Buildings and fixed equipment per 1 ha of UAA	317.75	169.33	13561	-11.074	0.000000

Source: see table 1.

Mann-Whitney U test results for farms with predominantly animal production indicate that there are other relationships. For the value of machinery and technical equipment per 1 ha of UAA, the p-value calculated in the test is lower than the assumed level of significance (0.05). Therefore, it was concluded on the basis of the average rank that the machine use level of economically strong farms was significantly higher than for the economically weak ones. On the other hand, the differences in terms of burden on 1 ha of UAA by the building value between economically weak and strong farms were statistically significant (Table 3).

Table 3. Results of the Mann-Whitney U test for selected indicators of farms with mainly animal production

Specification	The average of the ranks in farms economically		Statistic U	Statistic Z	p-value
	weak	strong			
Machinery and technical equipment per 1 ha of UAA	53.53	83.78	3039	4.489	0.000007
Buildings and fixed equipment per 1 ha of UAA	64.90	67.57	2164	0.397	0.691037

Source: see table 1.

3.2. General characteristics and resources of farms in the countries of Central and Eastern Europe

In selected countries of Central and Eastern Europe, the economic size of farms classified in the group of economically weak and strong farms was characterised by considerable variation. The smallest economic power in the first group was featured by Romanian farms (EUR 5,900), and the highest by Hungarian ones (EUR 11,500), and in the second group by Slovenian (EUR 89,900) and Bulgarian farms (EUR 166,400) respectively.

When comparing the economic size relative to each other between the two groups of farms in individual countries, the smallest span of this measure has been found in the case of farms in Slovenia (8.4-fold), and the largest in Bulgaria (25.6-fold).

In most countries, as regards the structure of the value of economically weak and strong farms, there was mostly crop production, whose share in the first group ranged from 47.8% to 74.2%, and in the other it ranged from 53.3% to 85.0%. In the case of economically weak farms, Bulgaria and Romania were the exceptions; animal production in both countries had a greater share in the value of production: by 5.9 and 5.5 percentage points respectively. On the other

hand, Slovenia was an exception among the economically strong farms; the advantage in the structure of animal production amounted to 11.7 pp. (Table 4).

Table 4. Economic size and production structure in economically weak and strong farms in selected countries of Central and Eastern Europe on average in 2010-2012

Specification	Economic size of farms economically		Structure of production value in total, of which:			
			crop production in farms economically		animal production in farms economically	
	weak	strong	weak	strong	weak	strong
	(EUR thousand)		(%)		(%)	
Bulgaria	6.5	166.4	46.4	83.6	52.3	12.1
Estonia	11.1	133.3	57.0	64.7	26.3	27.4
Hungary	11.5	117.4	74.2	75.9	22.7	18.4
Latvia	11.2	134.5	47.8	66.2	44.9	27.6
Lithuania	9.3	119.5	55.7	72.7	41.9	25.8
Poland	10.9	102.8	62.6	53.3	35.0	46.0
Romania	5.9	134.2	47.1	85.0	52.6	14.5
Slovenia	10.7	89.9	57.9	42.8	27.7	54.5

Source: Own compilation based on FADN EU (Farm Accountancy..., 2015)³.

The smallest UAA among economically weak farms was present in Romania (5.13 ha), and the largest in Latvia (35.02 ha). On the other hand, the smallest utilised agricultural area among economically strong farms was recorded in Slovenia (31.36 ha), and the highest in Bulgaria (323.90 ha). The span in terms of the utilised agricultural area in the first group was 6.8-fold, and in the second it was 10.3-fold (Table 5).

Table 5. Characteristics of basic farm resources in economically weak and strong farms in selected countries of Central and Eastern Europe on average in 2010-2012

Specification	Utilised agricultural area (UAA) in farms economically		Labour resources in farms economically		Annual work unit per 100 ha of UAA in farms economically		Total assets in farms economically	
	weak	strong	weak	strong	weak	strong	weak	strong
	(ha)		(AWU)		(AWU)		(EUR thousand)	
Bulgaria	5.86	323.90	1.72	9.28	29.5	2.9	24.89	1059.54
Estonia	32.57	295.29	1.04	2.64	3.2	0.9	56.50	419.19
Hungary	16.44	143.55	0.82	3.36	5.0	2.3	63.78	446.92
Latvia	35.02	276.93	1.49	4.59	4.2	1.7	43.90	435.98
Lithuania	23.79	224.54	1.46	3.50	6.1	1.6	57.33	497.65
Poland	10.95	64.57	1.46	2.98	13.4	4.6	95.60	512.92
Romania	5.13	276.94	1.26	4.87	24.6	1.8	28.35	394.82
Slovenia	8.09	31.36	1.37	2.70	16.9	8.6	151.43	464.89

Source: see table 4.

Manpower is an important resource of a farm. With its resources expressed as Annual Work Units (AWU), the largest employment was recorded in Bulgarian farms (1.72 AWU for economically weak, 9.28 AWU for economically strong farms). Conversely, the lowest

³ Farm Accountancy Data Network, 2015. <http://ec.europa.eu/agriculture/rca> (accessed: February 2015).

employment among economically weak farms was found in Hungary (0.82 AWU), and among economically strong farms in Estonia (2.64 AWU).

Labour force in all countries was used in economically strong farms in a more rational way. With the labour force expressed as Annual Work Units (AWU) per 100 ha of UAA, it ranged from 0.9 AWU in Estonia to 8.6 AWU in Slovenia. However, in the economically weak farms it ranged within 3,2-29,5 AWU, in Estonia and Bulgaria respectively.

There is also a very high variation in terms of the value of assets between countries. The value of total assets per farm in the group of economically weak farms ranged from EUR 24,890 in Bulgaria to EUR 151,430 in Slovenia (the variation was 6.1-fold). In contrast, the asset value in the group of economically strong farms ranged from EUR 394,820 in Romania to EUR 1,059,540 in Bulgaria (the variation was 2.7-fold). When comparing the value of assets relative to each other in the two groups of farms, the smallest advantage of economically strong farms was recorded in Slovenia (3.1-fold), and the highest in Bulgaria (42.6-fold) as shown in Table 5.

3.3. Equipment consisting of technical means and efficiency of their use in agricultural holdings

It is necessary to own fixed assets in order to achieve production and economic objectives, but the level of obtained economic results depends, among other things, on the extent to which the property is used effectively.

For a more detailed analysis of the differences in the production potential of farms, the size of selected resources has been relativised against the agricultural land resources and labour force. Measures characterising saturation of land by farm assets and measures describing land utilities and labour infrastructure were used in the analysis (Table 6).

Table 6. Equipment consisting of technical means in economically weak and strong farms in selected countries of Central and Eastern Europe on average in 2010-2012

Specification	Per 100 ha of UAA						Per 1 AWU					
	Total assets in farms economically		Machinery and technical equipment in farms economically		Buildings and fixed equipment in farms economically		Utilised agricultural area in farms economically		Machinery and technical equipment in farms economically		Buildings and fixed equipment in farms economically	
	weak	strong	weak	strong	weak	strong	weak	strong	weak	strong	weak	strong
	(EUR thousand)		(EUR thousand)		(EUR thousand)		(ha)		(EUR thousand)		(EUR thousand)	
Bulgaria	424.63	326.85	59.58	39.25	58.42	17.79	3.41	34.92	2.02	13.73	1.98	6.22
Estonia	173.78	141.89	25.84	48.12	31.89	25.38	31.42	111.96	8.13	53.82	10.00	28.40
Hungary	391.72	312.00	50.19	61.99	53.58	49.07	20.00	42.70	10.02	26.43	10.72	20.91
Latvia	125.33	158.08	20.80	48.66	12.28	21.17	23.60	60.46	4.92	29.25	2.89	12.65
Lithuania	241.24	221.89	84.08	83.93	27.76	20.28	16.33	64.19	13.72	53.86	4.51	13.01
Poland	872.64	794.27	96.52	151.05	207.10	158.16	7.48	21.65	7.22	32.71	15.50	34.24
Romania	552.93	142.46	50.75	37.20	224.42	18.01	4.06	56.83	2.06	21.16	9.11	10.24
Slovenia	1868.89	1482.80	243.52	293.96	460.98	475.96	5.97	11.63	14.54	34.21	27.19	55.37

Source: see table 4.

The results indicate that a significantly higher value of total assets per 100 ha of utilised agricultural area was recorded in economically weak farms, and their value ranged from EUR 173,780 in Estonia to 1,868,890 in Slovenia. For comparison, the value of assets in the economically strong farms in these countries amounted to EUR 141,890 and EUR 1,482,800 respectively, and hence was lower by 18.4% and 20.7% respectively. A higher value of assets (by 26.1%) was recorded only in economically strong farms in Latvia.

An important role in farm assets is played by machines and technical equipment since they constitute land utilities. Equipment consisting of machinery and technical equipment varied to a great extent among the surveyed countries of Central and Eastern Europe; this applies both to economically weak and strong farms. In the first group it ranged from EUR 20,800 to EUR 243,520 per 100 ha of utilised agricultural area, and in the other one it ranged between EUR 37,200 and EUR 293,960. The research indicates that the machine use level of economically weak farms in the two countries, i.e. in Bulgaria and Romania, was higher than in economically strong farms, and the advantage amounted to 51.8% and 36.4% respectively. It was similar in both groups in Lithuania (the value of machinery and technical equipment per 100 ha of UAA amounted to EUR 84,080 and EUR 83,930). On the other hand, the burden on the land by machinery and technical equipment in other countries was higher in economically strong farms, the advantage over economically weak farms ranged from 20.7% in Slovenia to 133.9% in Latvia.

Farm equipment consisting of machinery and technical equipment also has impact on labour infrastructure; it is expressed by the value of machinery and equipment per 1 annual work units (1 AWU). The research results indicate that the level of labour infrastructure in economically strong farms compared to economically weak farms was much higher. When comparing agricultural holdings of the two groups relative to each, the smallest advantage was observed in economically strong farms in Slovenia (2.4-fold), and the highest in Romania (10.3-fold). It should be added that labour infrastructure features a much smaller variation – resulting from the comparison of extreme values – than the measure describing the machine use level on land (Table 6).

To protect production process, agricultural holdings must have buildings that should be adjusted to the size and structure of production. Therefore, the size and type of farm buildings should result from the area of the conducted activities. In order to demonstrate the equipment consisting of buildings in economically weak and strong farms, the burden on land by their value has been assessed. The results show that the value of buildings per 100 ha of UAA varied to a great extent among the countries; in the first group of farms it ranged within EUR 12,280-460,980, and in the second within EUR 18,010-475,960. Given the size of the burden, there is a clear advantage of economically weak farms. In six countries out of the total eight under examination (i.e. in Bulgaria, Estonia, Hungary, Lithuania, Poland and Romania), the total value of the buildings, including their permanent facilities, per 100 ha of utilised agricultural area was higher than in economically strong farms (from 1.1-fold in Hungary to 12.5-fold in Romania). The burden on the farms by the value of buildings was higher for economically strong farms only in Slovenia and Latvia: by 3.2 and 72.4% respectively (Table 6).

The evaluation also covered the utilised agricultural area per 1 AWU. This value in economically weak farms in four countries (Bulgaria, Romania, Slovenia and Poland) did not exceed 10 ha, while in the other (Lithuania, Hungary, Latvia and Estonia) it ranged from 16.33 to 31.42 ha. However, a low value thereof was recorded in economically strong farms

in Slovenia (11.63 ha) and Poland (21.65 ha), while in the other countries it was significantly higher (it ranged from 34.92 in Bulgaria to 111.96 ha in Estonia) (Table 6).

The differences between the groups of farms in terms of owned fixed asset may be the cause of different efficiency in the use of these assets. The examined agricultural holdings show differences in the structure of owned assets; the development of the share of fixed assets in total assets is shown in Table 7. A higher share of fixed assets – meaning the assets requiring a permanent freeze of capital – in total assets was observed in economically weak farms in almost all countries (except for Bulgaria). This share ranged from 65.3% in Hungary to 94.5% in Slovenia. On the other hand, in economically strong farms it ranged from 55.4% in Romania to 90.6% in Slovenia. The biggest difference in the share of fixed assets in total assets between the identified groups of farms has been observed in Romanian farms (23.6 percentage points), whereas the lowest in Hungary (0.1 percentage points).

The possession and use of fixed assets in the production process involves depreciation, which represents a cost that decreases farm income. Table 7 presents the share of depreciation in total costs incurred by farms. This share in most countries (except for Bulgaria and Latvia) was higher in economically weak farms and ranged from 12.8% in Hungary to 31.6% in Slovenia. On the other hand, in the economically strong farms it ranged from 8.5% in Romania to 22.1% in Slovenia. The biggest difference in terms of the size of this indicator in groups of farms was found in Polish agricultural holdings (11.0 pp), and the smallest in the Hungarian ones (0.6 pp).

Table 7. Selected indicators describing economically weak and strong farms in selected countries of Central and Eastern Europe on average in 2010-2012

Specification	Share of fixed assets in total assets in farms economically		Share of depreciation cost in total costs in farms economically		Total value of production per 100 EUR of depreciation in farms economically	
	weak	strong	weak	strong	weak	strong
	(%)		(%)		(EUR)	
Bulgaria	59.0	86.0	11.5	13.6	1042	741
Estonia	83.0	72.3	18.3	16.2	515	584
Hungary	65.3	65.2	12.8	12.2	932	938
Latvia	66.8	63.0	15.2	16.7	621	568
Lithuania	72.6	66.3	28.5	19.8	382	618
Poland	90.3	86.8	24.7	13.7	478	934
Romania	79.0	55.4	16.2	8.5	950	1525
Slovenia	94.5	90.6	31.6	22.1	274	464

Source: see table 4.

Depreciation is a measure of consumption of fixed assets and therefore is a cost of the conducted activities. However, depreciation in the form of cost does not entail expenditure, it is the funds left at the farm that should make it possible to replace the fixed assets consumed in the production.

A strong relationship was found between the share of depreciation in the total costs of farms and the level of income per the size of fixed assets subject to consumption in the production process. It is reflected by the production value per EUR 100 of depreciation of such assets.

This indicator was lower in farms in which the share of depreciation in total costs was higher. In this respect, economically weak farms in most countries were in a disadvantageous situation (except for Bulgaria and Latvia). The production value per EUR 100 of depreciation ranged from EUR 274 in Slovenia to EUR 950 in Romania whereas in economically strong farms for the same countries – EUR 464 and EUR 1,525 respectively.

In economically weak farms in Bulgaria and Latvia – in comparison to the economically strong ones – the share of the depreciation cost in total costs was lower by 2.1 and 1.5 percentage points respectively. Furthermore, current assets in total assets in economically weak farms in Bulgaria accounted for 41% (as compared to 14% in economically strong ones). This phenomenon is advantageous for the development of agricultural holdings. These relationships are expressed by a higher production value per 100 euros of depreciation; in Bulgaria it was EUR 1,042 (as compared to EUR 741 in economically strong farms) and in Latvia it was EUR 621 (as compared to EUR 568) (Table 7).

The value of total assets and the value of buildings and machinery were evaluated in terms of the effectiveness of their use in the production process. The measure was formed by the value of production per EUR 1 of total assets EUR 1 of the value of buildings and machinery (Table 8).

Table 8. Efficiency of use of assets and efficiency of product in economically weak and strong farms in selected countries of Central and Eastern Europe on average in 2010-2012

Specification	Total value of production per 1 EUR of:				Total costs per 1 EUR of total value of production in farms economically	
	total assets in farms economically		buildings and machinery in farms economically			
	weak	strong	weak	strong	weak	strong
	(EUR)		(EUR)		(EUR)	
Bulgaria	0.36	0.25	1.30	1.42	0.83	1.00
Estonia	0.21	0.41	0.63	0.79	1.06	1.05
Hungary	0.25	0.39	0.96	1.08	0.84	0.88
Latvia	0.32	0.48	1.21	1.09	1.06	1.04
Lithuania	0.23	0.40	0.49	0.85	0.92	0.81
Poland	0.13	0.26	0.37	0.66	0.85	0.78
Romania	0.30	0.54	0.60	1.40	0.66	0.77
Slovenia	0.09	0.21	0.25	0.41	1.16	0.97

Source: see table 4.

The efficiency of use of assets in economically weak farms in almost all countries (apart from Bulgaria) was worse than in economically strong farms. The difference in favour of economically strong farms ranged from 50.0% to 133.3%. The efficiency of use of total assets in both groups of farms was the weakest in Slovenia and Poland, and the best in Latvia and Romania. It is evidenced by the production value per EUR 1 of assets: in Slovenia and Poland in economically weak farms it was EUR 0.09 and EUR 0.13 respectively, and in economically strong ones it was EUR 0.21 and EUR 0.26 respectively. Conversely, it was in EUR 0.32 and EUR 0.30 respectively in Latvia and Romania in the first group of farms, compared to EUR 0.48 and EUR 0.54 in the second group.

The efficiency of use of buildings and machinery was also worse in economically weak farms (with the exception of Latvia). This means that the value of production per EUR 1 of their value – as compared to economically strong farms – was lower and ranged from 8.5% to

57.1%. The efficiency of use of buildings and machinery in both groups was the lowest in Slovenia and the highest in Bulgaria.

The measure of the efficiency of production is the cost of producing EUR 1 of production value. When comparing the results in the two groups of farms, the measure in economically weak farms assumed less beneficial values in five countries out of the eight in question (Estonia, Poland, Slovenia, Latvia and Lithuania), and it ranged from EUR 0.85 in Poland to EUR 1.16 in Slovenia. However, in three countries: Romania, Bulgaria and Hungary, it was more beneficial than in economically strong farms and amounted to EUR 0.66, 0.83 and 0.84 respectively (Table 8).

4. CONCLUSIONS

In 2010-2012, in eight countries in Central and Eastern Europe (namely in Bulgaria, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovenia), in the total number of agricultural holdings covered by the FADN study, there were predominantly economically very small and small farms, which have been identified as economically weak. The economic situation of these farms varied and was determined by numerous factors. One of the most important of such factors is the size of the farm's productive resources and the ability to use them. On the basis of the conducted analysis, the following conclusions were drawn:

- In weak farms – as compared to the economically strong ones – there was a higher saturation of land by total assets (with the exception of Latvia), and it ranged from 8.7% in Lithuania to 288.1% in Romania. In most countries (with the exception of Latvia and Slovenia) there was also more farm equipment consisting of buildings and structures – it ranged from 9.2% in Hungary to 12.5-fold in Romania. Besides, in two countries (in Bulgaria and Romania) there were more land utilities: by 51.8 and 36.4% respectively.
- Economically weak farms in all countries had a higher value of fixed assets than the value of current assets. The share of fixed assets in total assets ranged from 59.0% in farms in Bulgaria to 94.5% in Slovenia. Moreover, in economically weak farms it was higher in comparison with the economically strong ones (with the exception of Bulgaria), the difference ranged from 0.1 pp in Hungary to 23.6 pp in Romania. A high share of fixed assets in the total assets has a negative impact, it generates high fixed costs and is one of the main barriers that reduce the opportunities for effective use of resources.
- In economically weak farms – as compared to the economically strong ones – the efficiency of use of total assets was lower (with the exception of Bulgaria), and the difference ranged from 33.3% for farms in Latvia to 57.1% in Slovenia. The efficiency of use of buildings and machinery was also lower (with the exception of Latvia), and the difference ranged from 8.5% in Bulgaria to 57.1% in Romania.

An important element of the CAP and EU development in the coming years is the modernization of farms. The aim is to increase their competitiveness. The main element of competitiveness is to minimise production costs, in that situation – in view of presented results – optimisation of the use of technical equipment is becoming increasingly important.

A dominant share of fixed assets in total assets, and thus strong farm equipment consisting of buildings and machinery has a negative impact. Each of the technical means of labour affects the level of production costs and therefore should be purchased strictly according to the needs of a farm. Technical overinvestment causes deterioration in the financial result. Adaptability

of such farms to changes in market conditions is also reduced. Overinvestment means that technical measures are not fully utilized. Such a situation implies an increase in costs and leads to a decline in the profitability of production. The threat is the material risk, ie. the danger of incurring a loss. Preventing this from happening is a challenge for the science and practice for the XXI century.

Under the influence of economic factors resulting from the operation of the CAP, farms are still better adapting to the natural conditions and some of them can also exploit their advantages, such as relatively large labor resources, which stimulate the growth of environmentally friendly production. The reevaluation of the quantitative development concept takes place in favour of the qualitative solutions. The cultivation technology is improved taking into account not only the production and economic effects, but also the safety of the natural environment. The model of intensive farming in European conditions loses its importance. Different than only production perception of the agriculture appoint it to fulfill other tasks. The concern for human health, the environmental protection and cleanliness, and the preservation of landscape suggest a slightly different direction for the development of farms. By 2050, the global population is projected to be by 50% larger than at present. Further increases in agricultural output are essential for global political and social stability and equity. To maintain the food production at the appropriate level, is the major challenge. But doing so in such a way that do not disturb the environmental balance and public health is a greater challenge still. This direction of agricultural development, however, should predominate, the net benefits to society will be much higher in comparison to the highly intensive agriculture.

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IMPLEMENTING FAMILY –FRIENDLY ORGANIZATIONAL PROGRAMS: ANALYZING THE EFFECTS ON WORK-FAMILY CONFLICT OF EMPLOYEES

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Key words: *work-family conflict, social support, spouse support, work-place support, family-friendly programs*

ABSTRACT

Successful balancing of work and family demands is impacted by factors on three levels including governmental, organizational and individual. In many economies the governmental support for balancing work and family demands has been decreasing and those countries are witnessing a rise in family-friendly programs that employers are offering to their employees, however it remains unclear how the support available in the workplace and support available at home affect the conflict between work and family demands. Based on the data collected from 1500 employees from nine companies that acquired the "Family-friendly company" certificate this paper examines how available support impacts the work-family conflict. We developed scales with the help of factor and reliability analysis and explored dependencies using OLS regression models. The study shows that work demands affect the work-family conflict, but much less to not at all the family-work conflict. Social support in the workplace is very important, but it is the emotional support one can expect at work and not just institutionalized and implemented family-friendly programs and practices, that is reducing the work-family conflict. In general both work and family support have a moderating effect on how demands affect the conflict. We argue that in order to become a family-friendly organization it is not enough to develop and practice family-friendly programs but it is crucial to truly adopt and internalize the family-friendly corporate culture throughout the organization, so that employees offer each other support when needed.

1. INTRODUCTION

Balancing work and family demands has been an increasing challenge for many individuals and families (Darcy et al., 2011; Ilies et al., 2009; Khallash & Kruse (2010); Kreiner et al., 2009). The discussion on how to reduce the conflict between work and private life has been active among politicians, managers and employees (Barling, 2005). Demographic and socio-economic movements like ageing population (Eby, Casper, Lockwood, Bordeaux, & Brinleya, 2005), higher women participation in the work market (Boyum-Breen, 2006), increasing age at retirement (Kohli, 1991), longer working days (Lewis, 2003), more men involvement in family life (Gambles, Lewis, & Rapoport, 2006), reduced institutional support for work life balance in transition economies (Poelmans & Kalliath, 2008; Trefalt, Drnovšek, Svetina-Nabergoj, & Adlešič, 2013) have caused that individuals find it harder to manage and balance competing demands (Hewlett & Luce, 2006; Valcour et al., 2011). People have many roles that can be separated in two domains, work and private of family life (hereafter we will use word family, to refer to the private life domain) (Frone & Russell, 1992a). Successful balancing of all demands is impacted by several factors that can be clustered in three levels including governmental (Saltzstein, Ting, & Saltzstein, 2001), organizational (Beauregard & Henry, 2009) and individual (Tausig & Fenwick, 2001). The role of employers and the support they provide to their employees is gaining importance (Goff, Mount, & Jamison, 1990) as companies around the world are introducing several practices to help their employees give their best at work and at home (Lau, Hem, Berg, Ekeberg, & Torgersen, 2006).

Socially responsible business practices in are no longer just about a humanitarian or charitable involvement in various events. They involve the integration of responsibility for different areas in the business environment into the company's strategy (Friedman, 2007). Fields of action include environmental protection, human rights, equal opportunities, health and safety, business ethics, and facilitating the balance of work and family life (Heslin & Ochoa, 2008; Otubanjo, Amaeshi, & Olufemi, 2008). Employers are showing an increasing degree of social responsibility to their employees (Bretherton, 2008), including internal communication, better working conditions, continuous training and education, providing equal opportunities and facilitating the reconciliation of work and family life (Webber et al., 2010). If employees experience a serious imbalance in their work-family divide, the employer faces additional costs due to absenteeism (Allen, 1983), staff turnover (Hinkin & Bruce Tracey, 2000), accidents at work (Monnery, 1998) and, even more indirectly, costs arising from employee dissatisfaction and lower commitment to work (Rusbult & Farrell, 1983), etc. It is becoming ever clearer that attitudes to the work-life balance and parenting cannot only be governed by legislation, but need to also be addressed at the organizational level (Bloom, Kretschmer, & van Reenen, 2006; Pärnänen, H. Sutela, & Mahler, 2007; Raskin, 2006).

Since the governmental support for balancing work and life demands has been decreasing in many economies due to economic downturn like for example Slovenia (Edlund, 2007; Trefalt et al., 2013) those countries are witnessing a rise in family-friendly programs and practices that employers are offering to their employees. Although the family-friendly organizational programs are being increasingly introduced in all continents including Europe (Klammer & Klenner, 2004), Australia (Parkers & Langford, 2008) and USA (Epstein, 2006) there is no clear understanding of how the support available at work and support available at home and the interplay between both affect the work-family and family-work conflict of employees (Goff et al., 1990; Kossek & Nichol, 1992).

This paper focuses on understanding the mechanisms that influence the conflict between work and family demands. Based on the data collected from more than 1500 employees from nine companies in Slovenia that acquired the "Family-friendly company" certificate this paper examines how the elements of social support inside and outside the workplace influence employees' conflict between work and family demands. We use off-the-shelf scales where available and develop our own as needed, using exploratory and confirmatory factor analysis. The model is then tested using OLS multiple regressions varying the dependent variable and using different sets of explanatory variables.

This paper contributes to existing literature in two ways. Firstly, we propose and empirically test the model that explains the influence of social support inside the organization (management and coworkers) as well as social support one has outside their job (spouse, family and friends) on one's perception of work-family conflict as well as family-work conflict. Secondly, we propose some recommendations for companies on how to successfully nurture family-friendly corporate culture.

2. LITERATURE REVIEW

2.1. Work-family conflict

In the literature on work and life the work-family conflict (WFC) remains one of the most elaborated concepts. We follow the Greenhaus and Beutell's definition that WFC is "a form of interrole conflict in which the role pressures from the work and family domains are mutually incompatible in some respect (1985). This is, participation in the work (family) role is made more difficult by virtue of participation in the family (work) role" (Greenhaus & Beutell, 1985, p. 77). The research of the work-family conflict suggests that multiple roles with its infinite demands are likely to cause a conflict for individuals because they have scarce resources such as energy and time to meet these demands (Goode, 1960). According to Greenhaus and Beutell's definition (1985), work-family conflict can occur in two directions: work can interfere with private life (work-family conflict, WFC) or private life can interfere with work (Family-work conflict, FWC). For example, a working parent might experience WFC due to long, irregular, or inflexible work hours, work overload and other forms of job related stress, extensive travel due to work, unsupportive supervisor, coworkers or organization (Voydanoff, 2004). For example, an unexpected meeting late in the afternoon may prevent a parent from spending quality time with children and spouse or preparing a meal for the family. On the other hand a working parent might experience FWC due to the primary responsibility for young children, responsibility for elderly family members, interpersonal conflict within the family or unsupportive family members (Hill et al., 2008). For example, a parent may need to take time off to care for a sick child or to accompany a sick family member to the hospital. Although in early studies work-family conflict has been conceptualized as a uni-dimensional construct (Kopelman, Greenhaus, & Connolly, 1983), later studies distinguish two distinct constructs (Michael R. Frone, Russell, & Cooper, 1992b; Kelloway, Gottlieb, & Barham, 1999) depending on the direction of the interference, namely WFC and FWC. Accordingly, in this paper we look at how family and work demands affect each of those conflicts and the moderating effect of family support and support at the workplace. The conflict between family and work is intensified with higher demands an individual faces and diminished with higher levels of support one receives both at the work place and in their family. However two types of conflict, namely WFC and FWC are expected to be influenced in different ways whether the demands are work or family related and whether support happens in the workplace or at home.

2.2. The role and nature of demands

Demands are defined by Voydanoff (2005, p. 823) as: “structural or psychological claims associated with role requirements, expectations, and norms to which individuals must respond or adapt by exerting physical or mental effort”. Jones and Fletcher (1996, p. 34) define that demands are “the degree to which the environment contains stimuli that peremptorily require attention and responds” and “things that have to get done”. Work demands refer to “physical, social, or organizational aspects of a job that require sustained physical or mental effort, and are therefore associated with certain physiological and psychological costs” (Demerouti et al 2001 in Beham & Drobnic, 2010). Work demands may consist of long hours, shift work, frequent travel or job pressure, while examples of family demands are for example household and care responsibilities for children and older family members (Schaufeli & Bakker, 2004).

There exists tight relationship between demands and work-family conflict. Antecedents related to work-family conflict include family demands (e.g., number and age of children or hours of care provided to aging parents) (e.g. Duxbury & Higgins, 1991) as well as work demands (e.g. job pressure) (Voydanoff, 2005). Schaufeli and Bakker (2004) find that job demands and private-life demands both put a pressure on the work-family conflict. Authors Beham, Drobnic, and Präg (2010) show that individual perception of work-family conflict derives from assessing the extent to which demands hinder, or resources enhance, the performance of work and family roles. In study of Yang and Zheng (2011) found that American employees experienced greater family demands than Chinese employees, and family demands had a greater effect on WFC among Americans whereas work demands had a greater effect on WFC among Chinese workers. However, two types of conflict have different (Byron, 2005) and need to be studied separately (Frone & Russell, 1992a).

In this paper we expect to prove that work demands affect primarily the work-family conflict, while private life demands affect primarily the family-work conflict.

H1a: Work demands will increase work-family but not family-work conflict.

H1b: Family demands will increase Family-work but not work-family conflict.

2.3. The role and nature of social support

Social support is broadly defined as the ability to help relationships and the quality of those relationships (Leavy, 1983 in Parasuraman, Greenhaus, & Granrose, 1992). Hobfoll and Stokes (1988, p. 499) have defined social support as a “social connection or relationship that allows individuals to participate in, or sense of belonging to a person or a group that is perceived as loving and caring”. House (1981) cites that social support involves the exchange of resources between at least two persons, with the aim of helping the person who receives the support. The support elements can come from work, like for example managers or supervisors, co-workers and institutionalized family-friendly programs that are available to employees or the support available in one’s private life, like for example spousal support, support from family members and friends and paid support (cleaning or childcare help) (e.g. Kossek, Pichler, Bodner, & Hammer, 2011).

The classification of social support goes even further than separating support depending from where it comes from (work or private domain) and some authors also differentiate between the different types of support, namely instrumental and emotional support (Abendroth & Den Dulk, 2011). Instrumental support refers to e.g. tangible support and assistance aimed at solving problem and emotional support refers to more intangible aspects e.g. listening and

providing empathy (Adams, King, & King, 1996). Authors like Abendroth and Den Dulk (2011) differentiate between instrumental and emotional type of support in both the private domain and the workplace. Following their examples organizational family friendly programs available to employees can be seen as instrumental support in the workplace. While on the other hand, emotional support comes from managers and supervisors as well as from coworkers when they show empathy for the employee's work-life balance situation. In the private domain, emotional support comes from the spouse, family members and friends, while instrumental support comes from example from paid childcare or household help.

Given the focus of this paper it is important to look into the relationship between those two types of support in the workplace and how it affects the work-family conflict as well as family-work conflict. Research findings suggest that both instrumental as well as emotional supports are needed in the workplace. Instrumental support in the workplace is not enough to achieve a successful work-life balance (Abendroth & Den Dulk, 2011; Den Dulk & Peper, 2007; Lyness & B., 2005). The emotional support aspect coming from supervisors and coworkers is crucial for the actual take-up of workplace family-friendly programs and for successfully managing work and family life. Behson (2005) found that emotional support explains more variance in work-family conflict than work-family benefits. As Abendroth and Den Dulk (2011) prove that emotional and instrumental support in the workplace have a complimentary relationship. Emotional support alone is insufficient and family-friendly arrangements at the organizational level also appear to be necessary to help employees with work-family conflict.

In our paper we differentiate between instrumental and emotional support in the workplace, operationalizing the instrumental support with institutionalized family-friendly programs that the company offers to its employees. We measure emotional support in the workplace through the perception of support one gets from superiors and co-workers in the company, like for example having empathy and understanding for each other's work-family challenges and helping each other in times of high pressure related to balancing work and family responsibilities. Because of the post-socialist tradition in Slovenia we didn't include instrumental support within the private domain. Paid domestic help and similar arrangements are extremely rare, as well as paid childcare since public childcare options are available and affordable to basically everyone. Instead we decided to measure separately the emotional support from the spouse and support coming from other family members. We did that for two reasons – first we believe there is a different level of emotional support involved with spouse versus extended family and second, support from friends and neighbours is rarely used in work-life research.

Many authors mention the importance of support in connection with work-family conflict. For example, Anderson, Coffey, and Byerly (2002) identified the support of co-workers as an important coping mechanism in struggling to balance professional and family obligations. Furthermore, authors Pines and Aronson (1983) in their research discovered that professional employees are evaluating emotional support as one of the most important social support functions. Taken all together, social support has been proven to help reduce the conflict between work and private life demands. Among employed individuals there are two sources of social support –support at work and support in private life.

Studies have found that support people get affects the way demands influence the work-family conflict people experience. Thomas and Ganster (1995) found that work-family policies are negatively related to the work-family conflict. Allen (2001) suggested that the

availability of family supportive benefits might be indirectly related to work-family conflict through the perceived family supportiveness of the organization. Her results indicate that workers who perceived the organization as less family supportive experienced more work-family conflict and less job satisfaction than employees who perceived their organization as more family supportive.

Prominent in the research on the support in private life are studies on spousal support. Studies show both a direct and a buffering effect of spousal support on work-family conflict (e.g. Matsui, Ohsawa, & Onglatco, 1995; van Daalen, Willemsen, & Sanders, 2006). Other sources of support, such as help from friends, neighbors and paid domestic help are a less frequent topic of research.

In the context of this research, we expect family-friendly programs in the company and supportive supervisors and co-workers make work responsibilities less overwhelming by offering support in times of high pressure from balancing work and family demands. Similarly, we expect support from spouse and family members to help decrease the family-work conflict by offering understanding and taking over some family responsibilities when one faces hardship in coping with demands in both roles.

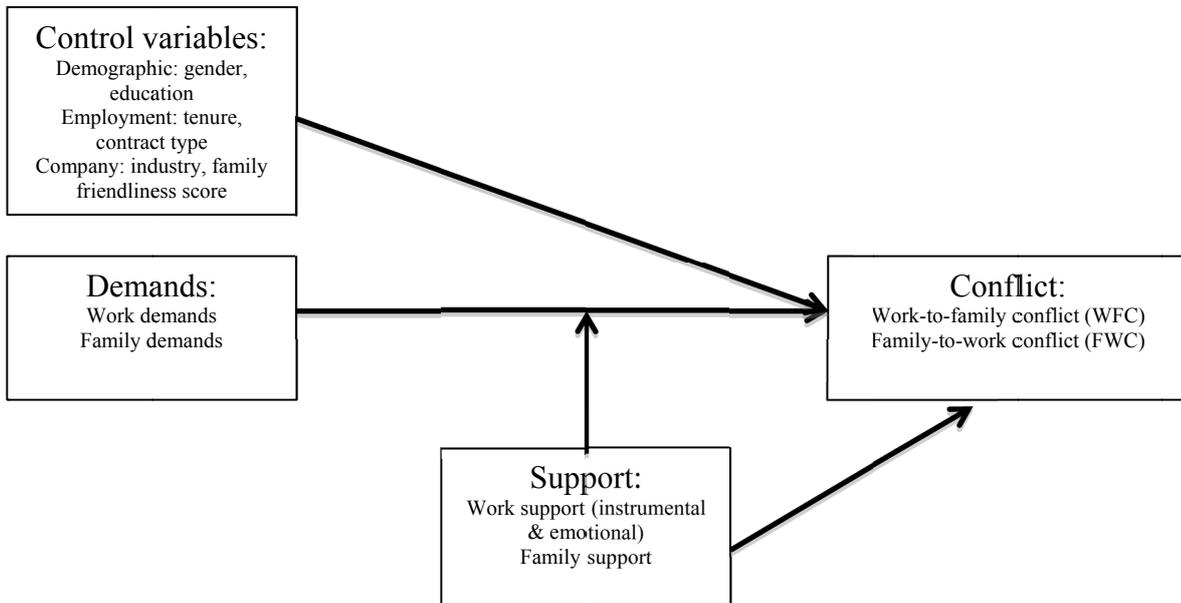
H2a: Work support will decrease work-family but not family-work conflict

H2b: Family support will decrease family-work but not work-family conflict

We want to support the relationship between constructs, where support (in the workplace and in private life) moderates the relationship between demands (at work and at home) and the perceived conflict between family and work demands (WFC and FWC). Based on the literature review, it is expected that different sources of support (in the workplace and in private life) help reduce the demands' pressure. As Abendroth and Den Dulk (2011) argue, work and life demands do not necessarily have a negative impact on work-life balance, when there are adequate mechanisms of support in place to help the individual cope with these demands. House (1981) argued that social support could mitigate or buffer the effect of potentially stressful objective situations by causing people to perceive the situation as less threatening or stressful. Schaufeli and Bakker (2004) therefore hypothesized a negative relationship between work demands and work resources in their study, since job resources potentially reduce job demands. Furthermore, authors suggest some examples of how family-friendly policies in the workplace can help employees accommodate their family responsibilities without reducing work hours or the amount of work that is performed (Voydanoff, 2005). Those include dependent care benefits and flexibility regarding when work is done, for example, flexible work schedules. Family-friendly work programs and practices make it easier for employees to accommodate family responsibilities by enabling workers to take time from work or to work part-time in order to meet family responsibilities. Accordingly, we expect the support (in the workplace and in the family) to moderate the effect of demands (in the workplace and in the family).

H3: Support will moderate the effect of demands, making it less intense.

Figure 1. Conceptual model



3. RESEARCH METHOD

The research approach we took to test the conceptual model presented above was quantitative analysis using secondary data sources. The data source we are using is a questionnaire, which is part of the on-going evaluation of companies that obtained the »Family-Friendly Company Certificate«.

»Family-Friendly Company Certificate« has been introduced to Slovenia as an extensive nationwide project in 2007 to help companies develop and implement family-friendly programs and practices. The basis for introducing the Family-Friendly Company certificate was the "European Family Audit" system developed by the German organisation Berufundfamilie. In Slovenia, the procedure for obtaining a certificate was introduced by the Ministry of Labour, Family and Social Affairs in partnership with the Ekvilib Institute, which is an audit institution. With government support the number of companies is growing each year, from 32 in 2007, to over 60 in 2011 and more than 130 in 2014 (Ekvilib, 2014). The »Family-Friendly Company Certificate« project offers a catalogue containing 150 family-friendly programs that are divided into eight thematic groups including: working time, organisation of work, workplace arrangements, information and communication, leadership skills, human resources development, compensation and rewards, and services for families. Some examples of family-friendly programs are shown in table 1.

Table 1. Groupings of the family-friendly programs the company can introduce

Groups of family-friendly programs	Examples of family-friendly programs the company can introduce
Working time	Flexible working time, shift work, part-time work, time bonus, condensed working week, job sharing, extra personal leave, shortened work time for parents, working time by life-phases, child-time bonus, flexible holiday planning, flexible work breaks
Organisation of work	Corporate team for WLB support, health and wellness programs, innovation in work processes and flows, employee replacement strategies, team work, job replacement, job sharing
Workplace arrangements	Telework, work from home, financial and technical support for remote work
Information and communication	WLB education programs, annual WLB survey, employee meetings, company open day, annual interviews
Leadership skills	Social skills, continuous education on WLB and wellness issues for the leadership, 360° analysis, share of women in leadership positions
Human resources development	Interviews, career planning, education programs during work time or with organised childcare, management training, gender equality opportunities, minorities employment, paternal leave
Compensation and rewards	Gifts for newborns, scholarships, loans, compensation for free time activities, psychological counselling, education for parents, housing support
Services for families	Counselling, child care, vacation offers, on-site childcare facilities, family room, family activities for employees, summer activities for school-aged children, relaxation room, New Year celebration and gifting for children

Source: BerufundFamilie (2015)

The above mentioned questionnaire collects data on the employee level, for a sample of employees in the companies that have the certificate. In total, more than 1500 employees from nine companies that acquired the “Family-friendly company” certificate participated in the survey, used for this paper. For practical reasons two modes of data collection were used – web or paper questionnaire – depending on the company and job position. We tested the differences between the two modes using group comparison tests and found no systematic differences between the two modes of collection, so we don’t treat them separately. The number of employees in individual companies varied from 75 to just under 400. Sampling in individual companies varied from complete coverage to random sample, with cluster sampling, using departments as clustering units, was employed as the sampling method.

We first checked the consistency and reliability of existing scales and developed new scales using exploratory factor analysis and reliability testing. We used the scales in an OLS regression using the Matthews, Kath and Barnes-Farrell scale (2010) for “Work-to-life conflict” as the dependent variable. We included explanatory variables in a hierarchical manner, adding blocks of variables as follows: personal characteristics, work-place characteristics, perceived support from private life (spouse, family and friends) and perceived support at work.

4. FINDINGS

First we tested the consistency of scales that we used to measure demands, support and conflict. We argued that work-life conflict comes in two forms, as work-life conflict and as life-work conflict. We constructed a scale six items, half indicating work-life conflict and the other half life-work conflict. We tested the scale reliability using Crombach’s alpha and the

nomological and discriminant validities of the scale. Discriminant validity was tested using exploratory factor analysis (maximum likelihood extraction, varimax rotation) which yielded two factors and confirmatory factor analysis for the factor model we got, which did not reject the model. All the tests show that using two separate scales is more appropriate than using a single work-life conflict scale.

Table 2. Scales and relevant Cronbach's alphas

Item	Work-life conflict scale	Life-work conflict scale	Work-life conflict scale
I have to miss family activities due to the amount of time I must spend on work responsibilities.	0.750		0.679
I am often so emotionally drained when I get home from work that it prevents me from contributing to my family.			
The behaviors I perform that make me effective at work do not help me to be a better parent and spouse.			
I have to miss work activities due to the amount of time I must spend on family responsibilities.	0.711		
Because I am often stressed from family responsibilities, I have a hard time concentrating on my work.			
Behavior that is effective and necessary for me at home would be counterproductive at work.			

To test our hypotheses, we ran four sets of three OLS multiple regression models. We varied the models by the dependent variable – we tested separately for work-family conflict (WFC) and the family-work conflict (FWC) as a dependent variable. Also, we separated the effect of work demands and support at work on one hand and family demands and family support on the other hand, which, together with the division of the work-family conflict into WFC and FWC, gave us the four sets of models.

In each set, the first model included (besides the control variables) the demand variable(s). Work demands and family demands variables are both scales of two items each on a response, how much time does people dedicate to each of the activities. In the family demands we also included a separate variable, child-age pressure, which is calculated as a sum (18 - child age) over all children. As control variables we used demographic controls including gender, and education, as employment controls we used employee's tenure in the company and type of work contract he/she has and as company controls we used industry, the perception of how family-friendly the employer (company) is and whether or not the employee has actually used family-friendly programs that are available to him/her within the company.

The second model of each set included social support variables. In the family support, two separate scales for spouse support and other family members' support were used. In the work support we used the instrumental support variable (a three-item scale measuring the employee perception of how family-friendly the company is) as well as emotional support in the workplace (a six item scale measuring the support employee can expect from co-workers and managers and supervisors).

The third model for each set added the interaction between work or family demands and work or family support respectively in order to control for the moderating effect of support on the relationship between demands and work-life conflict.

Table 3. Effect of work demand and support on work-life conflict

		Model 1		Model 2		Model 3	
		b (t-value)	Sig.	b (t-value)	Sig.	b (t-value)	Sig.
Controls	(Constant)	3.54 (11.8)	***	4.2 (11.9)	***	5.89 (5.8)	***
	Company family friendliness level	-0.32 (-9.2)	***	-0.21 (-4.5)	***	-0.21 (-4.6)	***
	Use of family-friendly programs	-0.06 (-0.9)		-0.07 (-1)		-0.08 (-1.1)	
	Gender	-0.11 (-1.6)		-0.14 (-2)	*	-0.14 (-2)	*
	Tenure in the company	0 (0.5)		0 (0.1)		0 (0.2)	
	Years of education	-0.02 (-0.9)		-0.02 (-1)		-0.02 (-0.9)	
	Employment contract type	-0.19 (-1.6)		-0.21 (-1.7)	*	-0.2 (-1.6)	
	Banking Industry dummy	0.29 (2.4)	*	0.34 (2.8)	**	0.32 (2.6)	**
	IT industry dummy	0.27 (3.4)	**	0.28 (3.5)	***	0.29 (3.6)	***
Demands	Work demands	0.24 (4.2)	***	0.27 (4.7)	***	-0.28 (-0.9)	
Support	Institutionalized family-friendly programs (instrumental support)			-0.02 (-0.3)		-0.03 (-0.5)	
	Actual support in the workplace (emotional support)			-0.25 (-3.6)	***	-0.67 (-2.7)	**
Interaction	Work demands * Actual support at work					0.14 (1.8)	*
	R Square	0.213		0.233		0.237	
	Adjusted R Square	0.2		0.219		0.221	

The first model set shows the effects of work demands and support in the workplace on work-family conflict. As expected, higher work demands have a positive effect on work-family conflict (Model 1). Support at work lowers the work-family conflict (Model 2). Interestingly, it is not the institutionalized family-friendly programs and practices that the company has implemented but the actual support one gets or can expect from co-workers and superiors that has the effect. This leads to a conclusion that it is not enough to have the family-friendly programs in place (instrumental support), but what really matters in reducing the work-family conflict is how those programs are actually implemented through people in the company and home much support one gets or can expect from managers and co-workers (emotional support). Interaction, added in Model 3, changes the effects of support and demand quite dramatically. The demands' main effect becomes non-significant and even changes sign, the work support variable becomes even strongly negative, while the interaction coefficient is positive. We can therefore conclude that work support moderates the effect of work demands, so that they cause much less work-family conflict when adequate work support mechanisms are in place in the company.

Table 4. Effect of family demands and support on work-family conflict

		Model 1		Model 2		Model 3	
		b (t-value)	Sig.	b (t-value)	Sig.	b (t-value)	Sig.
Controls	(Constant)	4.77 (18.2)	***	4.77 (13.9)	***	4.2 (4.3)	***
	Company family friendliness level	-0.33 (-9.3)	***	-0.33 (-9.1)	***	-0.33 (-9.1)	***
	Use of family-friendly programs	-0.21 (-2.8)	**	-0.21 (-2.8)	**	-0.21 (-2.8)	**
	Gender	-0.13 (-1.8)	*	-0.15 (-2)	*	-0.15 (-2.1)	*
	Tenure in the company	0 (-0.5)		0 (-0.4)		0 (-0.3)	
	Years of education	-0.01 (-0.2)		0 (-0.2)		0 (-0.2)	
	Employment contract type	-0.14 (-1.2)		-0.15 (-1.3)		-0.15 (-1.3)	
	Banking Industry dummy	0.09 (0.7)		0.06 (0.5)		0.06 (0.5)	
	IT industry dummy	0.2 (2.4)	*	0.21 (2.5)	*	0.2 (2.4)	*
Demands	Child age pressure	0 (2.1)	*	0 (1.7)	*	0 (1.7)	*
	Family demands	-0.13 (-2.6)	*	-0.13 (-2.5)	*	0.1 (0.2)	
Support	Spouse support			-0.05 (-0.9)		0.09 (0.4)	
	Family support			0.09 (2.6)	*	0.09 (2.6)	*
Interaction	Work demands * Actual support at work					-0.04 (-0.6)	
	R Square	0.213		0.233		0.237	
	Adjusted R Square	0.2		0.219		0.221	

The second model set shows the effects of family demands and family support on work-family conflict. Family demands have a mixed effect on the work-family conflict. Child age pressure has a slight positive effect, while family demands a negative one (Model 1). Spouse support doesn't seem to affect the work-family conflict, while the support from family members is even positively correlated with it (Model 2). We believe the causation here is reversed – higher work-family conflict triggers the need for more support from other family members. Interaction, added in Model 3, is not significant and does not affect the model substantially. It however eliminates the counter-intuitive negative effect of family demands on the work-family conflict.

Table 5. Effect of work demands and support on family-work conflict

		Model 1		Model 2		Model 3	
		b (t-value)	Sig.	b (t-value)	Sig.	b (t-value)	Sig.
Controls	(Constant)	2.33 (9)	***	2.54 (8.3)	***	2.58 (2.9)	**
	Company family friendliness level	-0.15 (-4.9)	***	-0.11 (-2.7)	**	-0.11 (-2.7)	**
	Use of family-friendly programs	0 (-0.1)		0 (-0.1)		0 (-0.1)	
	Gender	-0.05 (-0.8)		-0.06 (-0.9)		-0.06 (-0.9)	
	Tenure in the company	0.01 (1.4)		0 (1.2)		0 (1.2)	
	Years of education	0.01 (0.5)		0.01 (0.5)		0.01 (0.5)	
	Employment contract type	0.13 (1.3)		0.13 (1.2)		0.13 (1.2)	
	Banking Industry dummy	-0.12 (-1.2)		-0.1 (-0.9)		-0.1 (-0.9)	
	IT industry dummy	0.17 (2.4)	*	0.17 (2.4)	*	0.17 (2.4)	*
Demands	Work demands	-0.01 (-0.3)		0 (-0.1)		-0.01 (0)	
Support	Spouse support			0.02 (0.4)		0.02 (0.4)	
	Family support			-0.11 (-1.8)	*	-0.12 (-0.5)	
Interaction	Work demands * Actual support at work					0 (0)	
	R Square	0.056		0.061		0.061	
	Adjusted R Square	0.041		0.043		0.042	

The third model set shows the effects of work demands and work support on family-to-work conflict. The R squares in models involving family-work conflict are three to four times lower than those involving work-family conflict – with this set of explanatory variables it is much harder to explain a substantial portion of the conflict in this direction, when work suffers because of family demands. Work demands don't have a significant effect on the family-work conflict (Model 1). Support at work lowers the family-work conflict slightly (Model 2), however, adding the interaction term in Model 3 eliminated this effect. In general, neither work demands nor work support seem to affect the family-work conflict substantially.

Table 6. Effect of family demands and support on family-work conflict

		Model 1		Model 2		Model 3	
		b (t-value)	Sig.	b (t-value)	Sig.	b (t-value)	Sig.
Controls	(Constant)	2.15 (9.7)	***	2.32 (7.9)	***	3.24 (3.9)	***
	Company family friendliness level	-0.13 (-4.4)	***	-0.13 (-4.1)	**	-0.13 (-4.2)	***
	Use of family-friendly programs	-0.09 (-1.4)		-0.09 (-1.4)		-0.09 (-1.4)	
	Gender	-0.03 (-0.6)		-0.05 (-0.8)		-0.04 (-0.7)	
	Tenure in the company	0 (0.6)		0 (0.7)		0 (0.6)	
	Years of education	0 (0.2)		0 (0.2)		0 (0.2)	
	Employment contract type	0.04 (0.4)		0.04 (0.4)		0.04 (0.4)	
	Banking Industry dummy	-0.25 (-2.4)	*	-0.26 (-2.5)		-0.27 (-2.5)	
	IT industry dummy	0.15 (2.2)	*	0.16 (2.3)	*	0.17 (2.4)	*
Demands	Child age pressure	0.04 (2.7)	*	0.03 (2.4)	*	0.03 (2.4)	*
	Family demands	0.04 (0.9)		0.04 (1)		-0.25 (-1)	
Support	Spouse support			-0.07 (-1.7)	*	-0.29 (-1.5)	
	Family support			0.06 (2.1)	*	0.06 (2.1)	*
Interaction	Work demands * Actual support at work					0.07 (1.2)	
	R Square	0.065		0.077		0.08	
	Adjusted R Square	0.049		0.058		0.059	

The final set of models shows the effects of family demands and family support on family-work conflict. Child-age pressure has a significant positive effect on the family-work conflict (Model 1). Partner support lowers the family-work conflict slightly, while the support from other family members seemingly increases the conflict (Model 2). Again, we argue the reverse causality, meaning that higher family-work conflict triggers help from other family members. It may also be that the need to ask and receive help from other family members consequently triggers feelings of guilt and indebtedness, adding to frustration and conflict in individuals. The interaction term added in Model 3 is not significant, although it alters the family demands coefficient drastically.

To sum up, we found strong support for Hypotheses H1a and H1b in the first model of each set. The work demands affect the work-family conflict, but much less to not at all the family-work conflict. Family demands have a mixed effect on work-family conflict, but a positive effect on family-work conflict. Regarding hypotheses H2a and H2b, work and family support are important, but in the case work support (H2a) the actual emotional support one can expect at work (not just institutionalized and implemented family-friendly programs and practices) is successful at reducing the work-family conflict, but quite ineffective in mitigating the family-work conflict. Spousal support helps reduce the family-work conflict, but not the work-family conflict, while support from other family members is, in contrary to expectations, positively linked to both work-family and family-work conflict. However, we do believe that it is the

experience of increased conflict between work and family demands that causes individuals to seek extra support from family members and not vice-versa, although other mechanism (e.g. guilt) may be at play. As previously predicted by Abendroth and Den Dulk (2011) and formulated in the hypothesis H3, both work and private life support have a moderating effect on how demands affect the conflict.

5. DISCUSSION AND CONCLUDING REMARKS

In transition economies we are witnessing the decrease in institutional support for balancing work and non-work demands at the national level. Accordingly companies are increasingly implementing different family-friendly programs to help their employees successfully balance work and private life demands. In Slovenia so far more than 130 companies have introduced family-friendly programs through a national project "Family-friendly company". Due to external monitoring and continuous evaluation of the project implementation all companies have succeeded in implementing the chosen family-friendly programs at the instrumental level (i.e. informing employees of their options, offering a wide variety of family-friendly programs and practices in order to address different employee needs, etc.), however there seem to be an important difference between companies in how their employees embrace the family-friendly programs at the emotional level (i.e. having empathy for co-workers and offering support to co-workers when they face work-life challenges, not refusing to adapt their workflow and work load when co-workers use family-friendly programs, etc.).

Based on our findings we argue that in order to become a family-friendly organization it is not enough to develop, institutionalize and formally practice family-friendly programs but it is crucial to truly adopt and internalize the family-friendly corporate culture throughout the organization, so that all employees embrace the work-life challenges and offer each other instrumental as well as emotional support when needed.

The research is based on a fairly large sample, however because of practical limitations of the research the number of scales and items is limited. Mixed modes of collection were used and although no significant differences between the modes were found, this may have an effect on the results, as well as different sampling modes in different companies. However, we do believe that including company controls solves most of these problems. A further limitation is that we have a single instrument for collecting variables on both sides of the regression equation. However, Harman's single factor tests with a value of 0,17 doesn't suggest any problems with common method bias.

Since we found some interesting positive links between the work-family conflict and support from family members others than the spouse, which we believe is caused by the reverse causality, it would be interesting in the future to collect temporal data in order to test this theory even further.

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THE MODELLING OF ENTERPRISE ZONE ALLOCATION IN CROATIA

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ABSTRACT

Using zero-inflated Poisson and negative binominal models to account for zero observation and binominal regression in the data, this study examines how enterprise zone patterns in Croatia vary across municipalities with differing income levels, human capital, fiscal revenues, unemployment rates, development intensity and voting profiles. The target population was enterprise zones in Croatia, and the sample used for this study approximately overlaps that population. The study included 555 municipalities in Croatia. Enterprise zones are a form of targeted economic development policy that provides special tax incentives to attract and retain companies to a few relatively poor communities rather than the entire country. This research examines the following main hypothesis: Do municipalities in Croatia adopt enterprise zones to benefit economically depressed regions?

JEL codes: C51, R12

1. INTRODUCTION

1.1. General issues

Croatia started its own enterprise programmes with the aim of improving the economic prospects of the most economically distressed communities. It is now generally recognized that “institutions matter” and that associated incentive structures substantially influence economic performance. Thus, Croatia has made efforts in this direction. The Act on Improving Entrepreneurial Infrastructure, adopted in July 2013, defines enterprise infrastructure, enterprise zones, and business support institutions (SBA Fact Sheet CROATIA, EU Commission, 2014). As an institutional instrument, that act aims to improve regulatory initiatives aimed at supporting SMEs and clearly sets out the conditions and criteria for helping SMEs and for construction of enterprise zones.

In the past decade, many local communities in Croatia experimented with using enterprise zones to stimulate private sector investment in economically depressed areas. Enterprise zones provide major tax incentives and other financial assistance to induce firms to expand their operations or relocate to the most economically distressed areas of the county. Enterprise zones are one of the most important economic development policy innovations at the central state level. In some Croatian counties (usually areas where mass poverty is concentrated), poverty by any reasonable measure is so pervasive that implementing policies of poverty alleviation by EZ (furthermore, acronym for Enterprise Zone) programmes aimed at job creation and unemployment reduction seems to be a rational development policy. The number of municipalities employing enterprise zones has increased dramatically from 116, which were dispersed over approximately 3500 hectares in the period from 2006 to 2008, to 346 in the period from 2010 to 2012. The enterprise zone area now covers more than 12,000 hectares.

1.2. Literature preview

An excellent literature review about the economics of EZs is provided in a paper that is referenced for an analysis of the efficiency of enterprise zone programmes (Mayneris and Py, 2014). To date, scholars have extensively studied enterprise zones from a policy evaluation-framework point of view; the main issue is whether the zones attract new investment and create jobs (Wilder and Rubin 1996; Peters and Fisher 2002; Greenbaum and Engberg 2003). However, what have been overlooked are the political questions of when do states decide to adopt enterprise zone programmes to aid distressed areas and whether those programmes can maintain their focus on the distressed areas over time. In the case of enterprise zones, inter-state competition and urbanization have the most significant effects on state policy choices. States facing significant competition from neighbouring states with enterprise zones were more likely to adopt and subsequently expand their enterprise zone programmes (Turner and Casell, 2007).

In the case of France, one of the most important EU members, two studies evaluate the recent French enterprise zone programme – the Zones Franches Urbaines policy – on business creation. The studies suggest a positive effect of the French enterprise zone on the probability that plants locate in targeted areas and on the number of establishments in targeted zones (Mayer et al., 2012, Givord et al. 2012). Several studies have explored this dimension in the United States. Whereas Billings (2009) finds no significant effect of the designation of enterprise zones on the number of establishments in Colorado, Neumark and Kolko (2008)

find a negative effect in the case of the programme conducted in California, and Hanson and Rholin (2011) identify a positive effect of US federal enterprise zones. Hence, results concerning the effects of enterprise zones on business creation seem to differ widely in the US and in France and depend on the programme (state or federal policy in the US).

In evaluations of US enterprise zone programmes, many studies find no significant effect on employment growth in designated areas (Boarnet and Bogart, 1996; Bondonio and Engberg, 2000; Neumark and Kolko, 2008; Lynch and Zax, 2011). However, some studies observe a rather positive effect of some US enterprise zone programmes (O'Keefe, 2004; Ham et al., 2011; Busso et al., 2013). Studies on European countries identify a positive effect of enterprise zones on labour market outcomes, with some restrictions. Einio and Overman (2011) evaluate the effect of the Local Enterprise Growth Initiative in the UK. They find a positive effect on employment, obtained however at the expense of the immediate periphery of targeted zones. In the case of France, two studies have found a positive effect on employment growth, although only in the short term (Rathelot and Sillard, 2009; Givord et al. 2012). The authors interpret this result as a shock modifying the level of employment, but not the trend. Again, the overall results concerning the effect of enterprise zones on local employment growth appear to vary depending on the programme.

Several studies have tried to assess the effect of enterprise zones on the employment of zone residents; indeed, growing employment in targeted zones does not necessarily imply that firms hire local workers, due in particular to a potential spatial mismatch between the skills needed by firms and the skills available locally. In the US, whereas Elevery (2009) did not find evidence that the designation of enterprise zones in California and in Florida affected the employment probability of zone residents, Busso et al. (2013) concluded that federal empowerment zones have a significant and positive effect on the employment of zone residents. Engberg and Greenbaum (1999) analyse the impact of state enterprise zone policies on housing market outcomes in small cities across the United States. When combined with information on the location and timing of enterprise zones, the authors found that, on average, state enterprise zones have had little impact on housing markets. In the case of France, Gobillon et al. (2012) focused on the effect of French enterprise zones in the Paris region. They found a small effect on the rate at which unemployed workers in targeted areas find a new job, this effect being however significant in the short term only. Charlot et al. (2012) studied the evolution of socio-economic conditions in the zones targeted by the French programme and did not find evidence of any effect on the unemployment rate. Therefore, the evidence is mixed concerning the US and French experiences.

Most studies on enterprise zones rely on difference-in-difference approaches. They rely on before and after comparisons (Papke, 1994; Greenbaum and Engberg, 2004) combined with control groups consisting of areas qualifying for enterprise zones. However, areas that applied but were rejected (Boarnet and Bogard, 1996; Hanson, 2009), or areas later designated enterprise zones (see for instance Busso et al. 2013; Neumark and Kolko, 2008) were not included.

1.3. The research subject

The following research questions are asked in this paper:

1. What characteristics explain and predict the probability of a municipality in Croatia utilizing an entrepreneurship zone programme?

2. What characteristics explain the frequency of the designated sizes of those EZ programmes in Croatia?

The paper is organized as follows. The next section begins by mapping out the research strategy including the conceptual framework and dataset, model specification and variables. The following section presents and discusses empirical results, and the final section concludes by providing implications for economic policy and further research.

2. CONCEPTUAL FRAMEWORK

2.1. Economic theory

Enterprise zone programmes designate specific areas as “zones” that qualify for lower taxes and, in some cases, less government regulation. Basic economic theory suggests that lower taxes and less regulation will increase jobs and incomes in the zones by attracting capital, labour, and economic activity. However, this theory is built upon a number of key assumptions; more-complex theories might produce different conclusions (Hirusana, Michael, 2005).

Our theoretical model, which in this paper we attempt to verify, is based on the consequences of this orthodox economic theory augmented by specific political and regional factors.

2.1.1. Socio-economic Determinants

Municipality policy choices are the product of societal actors’ response to changing economic and social conditions. The rational economic theory predicts that state decision-makers are more likely to adopt new economic development programmes under conditions of economic duress, although previous studies did not explicitly distinguish between geographically targeted versus balanced-growth policies (Rubin and Rubin 1987). We hypothesize that as economic conditions in a municipality worsen, officials are more likely to respond by enacting enterprise zone programmes. We operationalise economic distress using the annual unemployment rate (the CDLL database, 2014). We also include an annual measure of municipality per capita income and a development index to assess whether there any policy differences between more- and less-wealthy municipalities towards targeted economic development policies. In stronger municipalities, we assume that there will be less political pressure to design economic development programmes to address their needs. Larger government revenue per capita and a higher development index are associated with a lower probability of a municipality adopting an enterprise zone programme or increasing the number of enterprise zones. The reason we include human capital in the above specification is as follows. If local decision-makers are going to guide a municipality out of its underdeveloped state, they need a well-educated, skilled workforce to attract investment and human capital from outside the observation unit border. Therefore, to assess whether human capital stock positively affects the adoption of zones, we examined the link between the adoption of enterprise zones and human capital.

2.1.2. Partisanship/Ideology Determinants

Partisan or ideological models would suggest that changes in the composition of a state’s political elite should lead to a change in economic development policy. Enterprise zones are redistributive economic development policies that provide public resources from the haves to

the have-nots (Tao and Feiock 1999). Because political elites have differing views on redistributive social programmes, we predict political elites are likely to have differing views on enterprise zones based on their partisan and ideological orientations. To assess whether enterprise zone policy are affected by partisan or ideological factors, we include a measure of local executive partisan control and ideology: our opinion transmission of voting results for the Sabor (Croat parliament). We use the number of valid votes for central parliament per municipality. A "1" as a dummy variable indicates unified right-conservative control of state government, whereas a "0" indicates unified left-liberal control of state government. Although the original supporters of enterprise zones were a conservative coalition in the past decade, we predict municipalities controlled by the SDP coalition are more likely to adopt enterprise zone programmes because the programmes target assistance to traditionally left-wing democratic constituencies in urban areas.

2.1.3. Regional Determinants

Finally, we include a dummy variable for the three large regions to control for tradition and historical patterns in policy outcomes. However, we lack a prior theory of mutual interactions that would correlate with the dummy response variable.

2.2. Dataset and sources

In this paper, secondary sources are used. The secondary data in this study are from various sources and refer to different variables later in this paper. First, we have available the Croatian values of development and the calculation of the index of development at the local level (henceforth the CDLL database). The CDLL is a cross-sectional, economic-topic, nationally representative list of municipalities that was designed and conducted with the technical assistance of the Ministry of Regional Development and EU Funds to measure micro-economic development in Croatia (2014, October 13). This dataset is retrieved from <http://www.mrrfeu.hr>. It covers 555 municipalities. The sampling frame of the CDLL is based on a list of all municipalities in Croatia. Second, the data on entrepreneur zones (EZs) stem predominantly from two main types of sources. Both are linked to the Ministry of the Economy (2014, October 7). Those datasets (furthermore abbreviated by: EZD) are retrieved from: <http://www.strukturnifondovi.hr/.../prilog7.poduzetnikihzona2004-2013> and http://www.strukturnifondovi.hr/.../poduzetnicke_zone2015_obrazac_prijave. Finally, the ELECTORAL database, which covers the electoral results of Croatia's national parliamentary elections at the sub-national level, is sourced from Bochsler, Daniel (2010).

3. MODEL SPECIFICATIONS

The standard method of statistically proving facts is to test hypotheses. In our case, we formulate as the null hypothesis H_0 the claim that EZ adoption is not related to the various socio-economic, political and regional determinants. The related, alternative hypothesis is denoted H_1 .

We use the following model specifications to test two sets of hypotheses that explain the creation and subsequent proliferation of enterprise zones:

$$EZ_participation_{i,t} = \beta_0 + \beta_1 Per\ Capita\ Income_{i,t} + \beta_2 Per\ Capita\ Government\ Revenue_{i,t} + \beta_3 Unemployment\ Rate_{i,t} + \beta_4 Human\ Capital_{i,t} + \beta_5 Development\ Index_{i,t} + \beta_6 Ideology\ variables_{i,t} + \beta_7 Region_{i,t}$$

The above model with participation as a dependent variable will be estimated by probit regression:

$$Y^* = const + \sum X\beta + \varepsilon, \varepsilon \sim N(0,1) \quad (1)$$

if $Y^* > 0$, $y = 1$; $Y^* = 0$, $y = 0$;

where Y^* = EZ participation (yes or no),
 X = vector of independent variable.

The estimation of a size model will be performed by double-hurdle regression.

$$EZ_size_{i,t} = \beta_0 + \beta_1 Per\ Capita\ Income_{i,t} + \beta_2 Per\ Capita\ Government\ Revenue_{i,t} + \beta_3 Unemployment\ Rate_{i,t} + \beta_4 Human\ Capital_{i,t} + \beta_5 Development\ Index_{i,t} + \beta_6 Ideology\ variables_{i,t} + \beta_7 Region_{i,t}$$

As the regression's name suggests, two hurdles must be crossed to designate a size (land plot in hectares in this case). The "first hurdle" must be crossed to be a potential distributor of EZ size. Because municipalities are potential planners of the new economic zones, their current circumstances dictate whether the municipalities do in fact enlarge and how much they enlarge plot size; this is the second hurdle.

This model is able to capture excessively large numbers of zeros (Kleiber and Zeileis, 2008), e.g., municipalities without an EZ programme or land plot design. The double hurdle model contains two equations that are written as follows:

$$d_i^* = Z_i' \alpha + u_i$$

$$y^* = X_i' \beta + v_i$$

The two error terms are assumed independently distributed.

The hurdle model consists of two parts (hence, it is also called a 'two-part model'). The first is a binary part (given by a count distribution right-censored at $y = 1$): is y_i (size of EZ) equal to zero or is it positive? The second is a count part (given by a count distribution of the size variable left-truncated at $y = 1$): if $y_i > 0$, how large is y_i ?

Finally, the observed variable, y_i , is determined by the interaction of both hurdles as follows:

$$y = d_i y_i^* \quad (2)$$

Decisions concerning whether to participate in the EZ programme and about the size of zone Y can be jointly modelled. Questions to be answered include whether they are made simultaneously by the decision-maker; independently, whether they are made separately; or sequentially, whether one decision is made first and affects the other one (this is the dominance model, which will be used in this paper). Therefore, we consider below a regression of size on all further variables for the count part and model the inflation part as a function of the same variables.

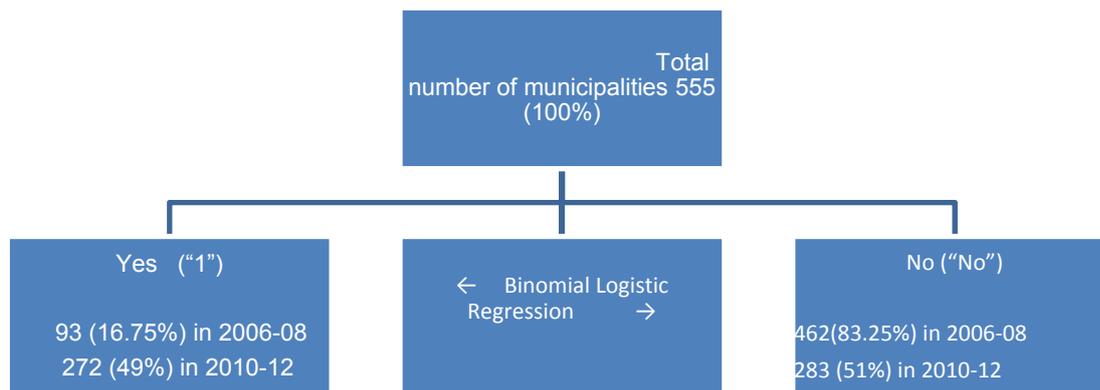
4. EMPIRICAL METHOD AND RESULTS

The research questions discussed earlier considered the utilization of EZ programmes a two-stage process in which decisions were sequential (see Figure 1). In the first stage, the decision was made by a municipality concerning whether to adopt an enterprise zone to benefit an economically depressed community. In the second stage, another decision was made by municipalities concerning the frequencies of the sizes of enterprises zones. For both stages, the decision was affected by the factors described in the conceptual framework. However, the effects of these factors on decisions can be different at different stages. Hence, we applied a two-stage model to investigate the determinants of utilization of EZ programmes.

In the first stage, we predicted the probability of a municipality utilizing EZ programmes. Our dependent variable is binary; therefore, the probability was modelled using a binary regression. In the second stage, we predicted the frequency of EZ by size of enterprise zones. Our dependent variable here is a count variable that reflects the number of ha used in EZ adoption. In this stage, as a dependent variable rounded to integer, we added the frequency of enterprise zone measured by discrete size of plot and expressed in ha.

4.1. Variables and descriptive statistics

Figure 1 Two-stage model of decision making concerning enterprise zone utilization



		Enterprise Zones					
		0	1	2	3	4	5
2006-08		462	81	8	1	1	2
		83.25%	15%	1.4%	0.2%	0.2%	0.4%
2010-12		283 times	218 times	39 times	11 times	3 times	1 time
		51%	39%	7%	2%	0.5%	1%

Source: Authors' estimations based on Prilog 7. Popis poduzetničkih zona 2004-2013

Because this study used a two-stage model, we employed two distinctive dependent variables. For the first stage, the dependent variable was whether a local government has adopted enterprise zone programmes to stimulate economic activity. This variable is a dummy variable that would take the value of 1 if the EZ concept were adopted. Conversely, it would take the value of 0 if such an enterprise zone programme did not come to life.

The distribution of this variable shows that approximately 17% of municipalities had an establish EZ programme at the first point of time observation (2006-2008), whereas 49% of the total population of all municipalities had adopted enterprise zones in 2010-2012. However, a significant share of total municipalities had no such programmes (see Figure 1). The distribution of this variable demonstrates that the highest proportion of municipalities had only 1 enterprise zone during both periods of observation, whereas a considerably smaller share, approximately 7% and 1.4%, had 2 adopted enterprise zones (see Figure 1).

As a secondary dependent variable, we added the frequency of EZ along municipalities measured by size. For the second stage, the dependent variable was a size variable indicating the frequency of land plot used in adoption of enterprise programme. This variable is continuous and varies from 0 to 543 (or 843).

The size frequency of averaged entrepreneur zone was considerably higher in 2010-12 than in 2006-2008, apparently because of the higher percentage of investors participating in entrepreneurship in the more-recent period. Additionally, we can see a somewhat different pattern of histograms in two cross-sectional points (see Figure 2 & 3, in Appendix). The result in Figure 4 indicates that the proportion of “false” municipalities (without EZ participation) decreases with income per capita, in 2006-2008. Figure 5 depicts that at higher levels of income per capita in the second time-period, a larger proportion of municipalities is linked to EZ.

That process resulted from the cumulative effects of earlier administrative, economic and political efforts and has no correlation with business success or failure. The data analysis linked to the dependent variable underscores the importance of the approach adopted in this research. First, the substantial differences in the mean of number and plot size frequencies across the different periods of phenomenon observations suggest that analysis at a disaggregated level (count and size) would be important for Croatian economic authorities. Second, the significant percentages of municipalities reporting zero frequency for a specific dependent variable (count variable) also necessitate the use of two-stage decision models. Last, the variable CVs (seventh columns in Table 1) indicate possible disparities in number and plot size of entrepreneur zones across the list of municipalities, warranting further investigation of the sources of the variation.

The local communities in this paper appeared to be typical for the mix of rural, urban and suburban communities the Croatia with certain exceptions (see Table 1). The communities' average per capita income in 2006-08 was approximately \$US 19,700. Some of the local communities are poorer, but one has an average per capita income of approximately \$US 39,700. When compared with per capita income figures for the later period of observation, one can see a decrease of the mean income per capita and the minor divergence among the poorest and wealthiest communities.

Table 1 Definitions and descriptive statistics of variables used in empirical model estimation

Variables	Definitions	Min	Max	Mean	SD	Coef. var
Dependent variable at 1st stage						
Binary variables ("1"/"0")	"1" if the enterprise zone concept is adopted, "0" in opposite case	0	1			
Dependent variable at 2nd stage						
Count_0	A count variable indicating the frequency of utilization (number of times an enterprise zone programme is adopted) from 1 to 5 in 2006-2008	0	5	0.213	0.578	2.776
Count_1	A count variable indicating the frequency of utilization (number of times an enterprise zone programme is adopted) from 1 to 5 in 2010-12	0	5	0.623	0.772	1.238
Size_0	A count variable indicating the frequency of plot size of enterprise zones per municipality (the amount of acres in a hectare linked to an enterprise zone) from 1 to 5 in 2006-2008	0	543	6.27	30.144	4.804
Size_1	A count variable indicating the frequency of plot size of enterprise zones per municipality (the amount of acres in a hectare linked to an enterprise zone) from 1 to 5 in 2010-2012	0	834	21.63	61.442	2.838
Independent variables						
INCPC_0	Average per capita income of municipality in 2006-2008	7267	39687	19657	5974	0.303
GPC_0	Average per capita revenue of municipality in 2006-2008	156	4237	2134	2653	1.243
UN_0	Average unemployment rate of municipality in 2006-2008	1.4	69.6	16.66	9.513	0.57
HK_0	Stock of human capital of municipality in 2006-2008	15.30	85	54.70	13.06	0.236
DI_0	Development index of municipality in 2006-2008	16.13	282.8	80.55	24.776	30.751
INCPC_1	Average per capita income of municipality in 2010-2012	7105	42175	21623	6084	28.13
GPC_1	Average per capita revenue of municipality in 2010-2012	223	10115	1984	1696	0.85
UN_1	Average unemployment rate of municipality in 2010-2012	4.5	54.8	18.88	9.16	0.48
HK_1	Stock of human capital of municipality in 2010-2012	31.65	90.41	68.6	11.07	0.161
NW (b)	Northwest Croatia (factor=1)		142 (25.6%)			
CEP	Central and Eastern (Pannonian) Croatia (factor=2)		197 (35.5%)			
AC	Adriatic Croatia (factor=3)		216 (38.9%)			
Dummy variable						
DI_1	Development index of municipality in 2010-2012	19.62	153.55	80.32	24.25	30.57
Categorical variables (a)						
LGC_0	Local government coalition dummy, taking the value of one if the authority is supported by a right-wing coalition (by more than half of valid votes) and zero otherwise (c)	0	1	0.59		

Source: Authors' estimation

Note: a) The frequencies with which the categories occur; b) Used as a base in the empirical model specification; c) The right-wing government in 2007 was a coalition of the following political parties: HDZ, HSS, ZS, ZDS, PGS, HSP, and HDSSB; the left-wing coalition comprised SDP, HNS, HSU-SU, and IDS party members.

Mean per capita fiscal revenue in 2010-12 was somewhat lower than that in 2006-08, showing that these trends occur because of a narrowing of the tax basis and may be a negative consequence of the ongoing great recession that began in 2009. Figure 7 shows that the proportion of number of municipalities that adopted enterprise zone and those who did not, changes considerably over the levels of fiscal revenue in 2010-12. There are comparatively much less variability among number of EZ and fiscal revenue per capita relationship in the first time-period (see Figure 6).

At 15 per cent, the unemployment rate in 2006-08 was greater than the national average (16.66), although the range of unemployment was rather large (1.4% to 69.6%). In 2010-12, despite the growth of the average unemployment rate, we note a narrowing in the range between the worst and the best municipality. According to Figure 10 we see directly that the proportion of municipality without EZ adoption in the second time period declines monotonously from less than 10% to 25% unemployment rate, whereas earlier we can state prevalence of municipalities without EZ, in all ranges of unemployment discontinuity (see Figure 9).

Human capital was measured using share of population with a high school education (HC). A higher population share with education indicates a higher quality labour force in the local community. Furthermore, a higher quality labour force is expected to be more efficient and therefore reduces the average cost of unemployment, leading to higher entrepreneurship or other economic activity. Areas with high levels of human capital provide a solid base of employees for future manufacturing firms, making firms more likely to enter an EZ programme. Hence, a positive relationship between human capital and the entrepreneurship zone variable(s) was hypothesized.

Another measure of economic change was the change in development measured by the development index; this figure decreased by a small amount, only 0.5 per cent on average, with some of the worst communities showing an increase condition or the best substantial deterioration vis-à-vis development. Therefore, even as incomes were growing, the overall conditions of economic development worsened. The dependent variable (as in the previous similar Figures) is categorical: to have or not to have EZ and the independent is interval-scaled development index. We assume that EZ (absent or present) is the variable, which is influenced by development. The independent interval-scaled index is split up into the value ranges. The general impression that comes out from visualising Figure 11 (and something less from Figure 10) is that moderate level of development increase the proportion of municipalities with EZ adoption. In the cases of under or (extremely) over-development unit of observation that can not be confirm.

The mean values for human capital varied significantly between two time-points of observation. In short, in the later period, the mean value indicated more-specialized skills available to entrepreneurs. The plot (Figure 13) shows that group of municipalities who adopted or were never adopted EZ program have approximately equivalent proportion at a 60-65%, as well as at an 80-85% measured range of human capital. Otherwise, the same plot shows higher involvement of human capital in observation unit with EZ then Figure 12 (that cast light on the first period 2006-2008).

Three major regions (Northwest, Central and Eastern, and Coastal) were delineated in line with internal administrative districts and county borders. Those regions emerged from associating Eurostat with the State department of statistics. The boundaries of administrative

districts overlap with those of statistical reporting districts where the municipality members reside. Following administrative boundaries and county borders, the formation of the three regions was guided by the location of mountain ranges and river flows, lowland parts and the Adriatic Sea coast. Furthermore, the regions reflect existing and potential economic differences across the country. For example, agriculture and many food industry plants are located in the Central and Eastern region, whereas the headquarters of government agencies, banks, industry and other major service sector organizations are located in the Northwest region. For calculation purposes, the Northwest region served as the base for the empirical model, allowing the comparison of regional effects. The economic force of the coastal region that stretches along the eastern part of the Adriatic Sea is based primarily on the tourism industry.

4.2. First stage: probability of utilizing enterprise zone programmes

4.2.1. Results of binary probit estimations for probability

Results of binary probit estimations for probability of adopting an enterprise zone are shown in Table 2.

Table 2 First stage: *probit estimation of probability of having an enterprise zone*

Independent variables	Count 0	Count 1
Constant	-20.052*** (-5.068) [0.000]	-13.612 *** (-4.512) [0.000]
Log(GPC)	0.145 (0.723) [0.481]	-0.159 (-0.975) [0.329]
Log(INCPC)	1.085* (2.483) [0.013]	1.017 ** (2.752) [0.005]
Log(UN)	0.268 (1.175) [0.241]	-0.236 (-0.974) [0.329]
Log(HK)	1.081 # (1.866) [0.063]	1.488 * (2.254) [0.024]
Log(IDEV)	0.489 (0.504) [0.614]	-0.2108 (-0.289) [0.772]
IDEOL_RIGHT	0.374* (2.057) [0.039]	0.277 * (1.971) [0.048]
REGION_CEP	0.113 (0.492) [0.624]	0.156 (0.824) [0.413]
REGION_AC	-0.504 * -(2.431) [0.014]	-0.492 ** (-2.807) [0.005]

Source: Authors' estimation

Notes: *Null hypothesis rejected; Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '#' 0.1 '.'; Numbers within parentheses () denote asymptotic t-values, and within [] p-values. The dummy variable for Region_NW, with 142 observations in sample \approx 555, was omitted. This facilitates comparison of adoption probabilities in Region_NW with the other two regions: Region_CEP and Region_AC. The similar political variable was also omitted.

We considered a sample of 555 municipalities that exist in Croatia. Not all municipalities adopted an EZ programme. It was therefore interesting to investigate what causes authority to decide to apply such programmes.

For both samples in different periods, the log of income per capita had a significantly positive coefficient in our probit regressions. Municipalities with a higher standard of living were more likely to accept applications for enterprise zones, although theoretical expectations predict the opposite – that is, that depressed areas would be more prone towards entrepreneurial zones. The latter counter-intuitive result brings to light one of the issues concerning the use of cross-sectional data. Instead of establishing causality, effects, determinants, or effects, our regression results may be read as implying correlations, relationships, and associations. However, the “correlations” presented assume *ceteris paribus* conditions. The sign of coefficient for human capital as independent variables in the model was as expected. The results indicated that the accumulation of human capital had a great positive effect on the likelihood of using an entrepreneur zone programme (with the marginal effect of 23% and 55%, in relation to the time of observation, respectively), which confirms that a deterioration of access to secondary education may result in a deficit concerning required professional skills.

The variable for Region_AC was significant at the 5% level and negative in the Count_0 (and Count_1) equation, with a marginal effect of -0.11 (and -0.18). This indicated that estimated in isolation, this region (coastal municipalities of the following counties: Istarska, Primorsko-Goranska, Splitsko-Dalmatinska and Dubrovačko-Neretvanska) was approximately 11-18% less likely to adopt an entrepreneur zone relative to counties in Region_NW. As for the ideological orientation of voters, we see the following. The positive and significant IDEOL_RIGHT as a coefficient indicated that estimated in isolation, more conservative units of observation were slightly more motivated to adopt an EZ programme relative to the liberal part of the sample.

The results of a probit regression indicate that log (GPC) did not affect adoption of an EZ programme with either definition for the study time-periods. Additionally, unemployment rate, development level, and dummy for the central-east region were not significant factors in determining adoption of EZ programmes for the study years.

Table 3 Marginal effects for the probit model

Independent variables	Count_0	Count_1
Constant	-4.402	-5.080
INCPC	0.238	0.377
HK	0.237	0.552
IDEOL_RIGHT	0.081	0.102
REGION_AC	-0.112	-0.181

Source: Authors' estimation

Table 3 presents the marginal effects for our probit models. The effects in Table 3 can be given a quantitative interpretation and are measured in units of probability. We consider here only the effect of significant variables. Here, the average effect of log of income per capita in the 2006-2008 sample of municipalities is 0.24; this figure increases in the later period. These results tell us that the probability of increasing income per capita occurrence for municipalities that adopted enterprise zones was 0.24 higher than that in municipalities without an entrepreneur zone, and with other variables staying intact, *ceteris paribus*. In the

sample that covers the 2010-12 period, that probability is somewhat greater, ceteris paribus, and amounts 0.38.

4.2.2. Predictive performance

The maximum and minimum values of the standardized residuals reported in Table 4 for the probit model did not indicate the presence of outliers. To test for the possible presence of heteroskedasticity, we have performed the Breusch-Pagan test. This test provides some evidence for the presence of heteroskedasticity in the regression that considers the Count_1 sample. The two models had very modest pseudo-R2, but relatively low fit is typical for models explaining individual behaviours in cross-section datasets.

Table 4 Diagnostic test results of the Probit models

		Count_0	Count_1
Standardized residuals:	minimum	-1.493	-2.023
	maximum	6.106	2.345
Heteroskedasticity LM	test value (df = 8)	55.964	10.927
	corresponding P-value	< 0.001	> 0.001
Pseudo-R2		0.14	0.07

Source: Authors' estimation

4.3. Second stage: probability of designating EZ

4.3.1. Two-stage models vs. single-decision models

Prior to choosing a hurdle model with the most suitable distribution in modelling frequency of EZ size, we will make some selection tests.

Hurdle models and single-decision models, using each of the Poisson, geometric and Negbin II, were estimated by maximum likelihood estimation (using the Newton-Raphson algorithm) for frequencies in ha of entrepreneur zones, rounded to an integral number.

Imposition of parametric restrictions on two-stage models resulted in single-decision models and implied that the latter were nested in the former models (Winkelmann, 1997).

Table 5 shows likelihood values for two- and single-stage models based on Poisson, geometric and Negbin II distributions, and χ^2 statistics. The likelihood ratio (LR) statistics test supported the choice of two-stage decision models. The calculated χ^2 statistics across that type of endogenous variable exceed the critical value (21.67) at $\alpha = 0.01$ with 9 degrees of freedom, confirming that the size in ha frequency data are characterized by over-dispersion and excess zeros. Additionally, the over-dispersion tests for Poisson regression suggest that those models in generalized linear regression form are not well specified because there appears a substantial amount of over-dispersion (Table 6). The test results also indicated that zeros and non-zeros come from two different data-generating processes, consistently stressing the importance of two-stage behaviour in modelling frequency data of ha concerning entrepreneur zone adoption in Croatia.

Table 5 Likelihood ratio statistics for testing two-stage decisions vs. single-decision in Hurdle model

Dependent variable	Poisson model			Geometric model			Negbin II model		
	Log Lu	Log Lr	-2λ	Log Lu	Log Lr	-2λ	Log Lu	Log Lr	-2λ
Size_0	-2362.6	-3017.7	-1310.2	-636.17	-684.53	-96.72	-636.0	-681.2	-90.4
Size_1	-8774.7	-10749.0	-3948.6	-1609.5	-1667.8	-116.6	-1602.2	-1648.1	-91.8

Source: Authors' estimation

Note: Log Lu are maximized log likelihood values from hurdle models, Log Lr are maximized log likelihood value from single-decision models, and $\lambda = \text{Log Lu} - \text{Log Lr}$. The critical χ^2 value is 21.67 at $\alpha = 0.01$ with 9 degrees of freedom.

Table 6 Dispersion test of Poisson regression

Dependent variable	Poisson GLM model	
	Dispersion z-test	p-value
Size_0	2.96	0.001
Size_1	3.982	0.000

Source: Authors' estimation

4.3.2. Vuong's non-nested tests

The next task was to choose a discrete distribution that best fitted the collected data. We used the non-nested model selection procedure proposed by Vuong (1989), assuming that the true data-generating process of size frequency in ha is unknown. Vuong's procedure tests the null hypothesis that two competing models equally well resemble the true data-generating process against the alternative hypothesis that one model outperforms the other. The three pairs of tested hypotheses were (i) Poisson hurdle model vs. geometric hurdle model; (ii) Poisson hurdle model vs. Negbin II hurdle model; and (iii) geometric hurdle model vs. Negbin II hurdle model.

Table 7 shows computed Vuong statistics, which had a standard normal distribution under the null hypothesis that the two models were equivalent. We focus primarily on the results linked to the size variable. The results decisively rejected the Poisson hurdle model in favour of geometric and Negbin II hurdle models, respectively in the case of the size variable. Additionally, the geometric hurdle model was rejected in favour of the Negbin II hurdle model in the case of Size_1 modelling, indicating that the Negbin II distribution is a good match for the observed distribution. In the case of the Size_0 model, we will choose the geometric hurdle model that appears better.

These test results illustrate that in addition to the hurdle framework incorporating two different data-generating processes, accounting for unobserved heterogeneity is important in modelling the frequency data, as is the plot size in ha, used in this study. It is likely that there are unobserved sources of heterogeneity that contribute to the differences in plot size frequency across municipalities. Accordingly, we report parameter estimates for Geometric and Negbin II hurdle models.

Table 7 Vuong's non-nested model selection tests among Poisson, geometric and Negbin II hurdle models

Dependent variable	Vuong's statistics		
	Geometric vs. Poisson	Negbin II vs. Poisson	Negbin II vs. geometric
Size_0	3.223[0.001]	3.221[0.001]	0.308[0.383]
Size_1	6.787[0.000]	6.775[0.000]	1.794[0.036]

Source: Source: Authors' estimation; [] p-value

Note: A large, positive test statistic with p-value < 0.05 provides evidence of the superiority of model 1 over model 2.

5. CONCLUSION

Using EZ participation and frequency data collected in Croatia in 2006-2008 and 2010-2012, this study uses binominal probit and hurdle count-data models to analyse dislocated zones among municipalities in a transition economy undergoing major structural changes in that field.

We estimate three discrete single-decision and hurdle models for Poisson, geometric and negative binomial distributions to test simultaneously for over-dispersion and excess zeros concerning number of hectares covering EZs. Hurdle models were shown to outperform single-decision models across the three distributions, suggesting that accounting for over-dispersion and excess zeros is essential in this study. From an economic behavioural viewpoint, the results confirm that zeros and non-zeros come from two different data-generating processes. Subsequently, Vuong's non-nested model selection tests identified Geometric and Negbin II hurdle models as the best fit to the 2006-2008 and 2010-12 datasets, respectively, across the land plot frequencies, indicating that accounting for unobserved heterogeneity is required in addition to addressing over-dispersion and excess zeros.

An advantage of the two-stage decision model is the ability to address municipalities who reported zero frequency of land assigned to an EZ purpose. Given the significant percentage of zero reports for most municipalities, distinguishing the decision of whether to designate plots of land for EZ programmes is an essential component of this research.

For both samples in different periods, the log of income per capita has a significantly positive coefficient in binominal regressions and in hurdle models. A municipality with a higher standard of living is more likely to accept enterprise zones as a development strategy. Poorer municipalities in Croatia, as measured by per capita income, are less likely to increase the number of enterprise zones, presumably to include more economically distressed areas. It is more difficult politically to justify targeting enterprise zones in economically distressed areas in poorer municipalities when depression hits the entire national economy. Croatia is plagued by the recession that started in 2009. Richer municipalities are more agile in bad times and less risk-averse towards investing in EZ programmes. The results of binominal (and hurdle) regression indicate that the accumulation of human capital has a positive effect on the likelihood of using an entrepreneur zone programme, stressing the importance of professional skills in finishing EZ projects.

The estimated results for land frequencies illustrate the importance of using the two-stage behavioural model. We thus obtain confirmation of the results of the probit regression on participation in EZ programmes; the insignificant effect of unemployment and fiscal revenue per capita on the probability of participating land demand indicates that local authorities are not driven to expand EZ programmes as a weapon in the battle against unemployment or to collect more taxes.

As stated, the estimated hurdle models confirm the results of probit regressions and clearly establish that income per capita, human capital stock, and conservative ideology concerning voting directly affect the participation decision to adopt EZ programmes and frequency of land in hectares. These results confirmed our expectation that EZ adoption patterns would differ across the various socio-economic units that constitute the average municipality in Croatia. In addition, this study revealed a noticeable difference in EZ adoption patterns across geographic regions. The economic effect of the transition towards a market economy in times

of homeland war on the fragile economies of coastal Croatia was equivalent to a strong negative external shock that further aggravated their economic situation. This region is characterized by lesser initiative in EZ adoption as an instrument of industry development than is the north-western region. This result is consistent with cognition implying a coastal reorientation away from a more- to a less-industrial region in the long term, in which EZ zones are relatively absent compared with the central part of Croatia.

We didn't use a longer series of data about EZ, as well as time-series methods to make the included variable comparisons, neither to test our main hypothesis. When this study on topic began, 2006-08 and 2010-12, were the earliest and most recent time, respectively, available and adequately geo-coded data years. Therefore, we used regression models for binary and count data as micro-econometric instruments in our research. We recommended using time-series (or panel) methods to examine the relationship between periodic changes in unemployment rates, income, etc. and activity within EZ if the future source of adequate data would permit. In some future study, we recommended including a fuller accounting of benefits and costs both in terms of effects on public finances, provision of services, and economic impacts (for example on real estate prices) from project investments and employment in the enterprise zone.

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APPENDIX

Figure 2



Figure 3

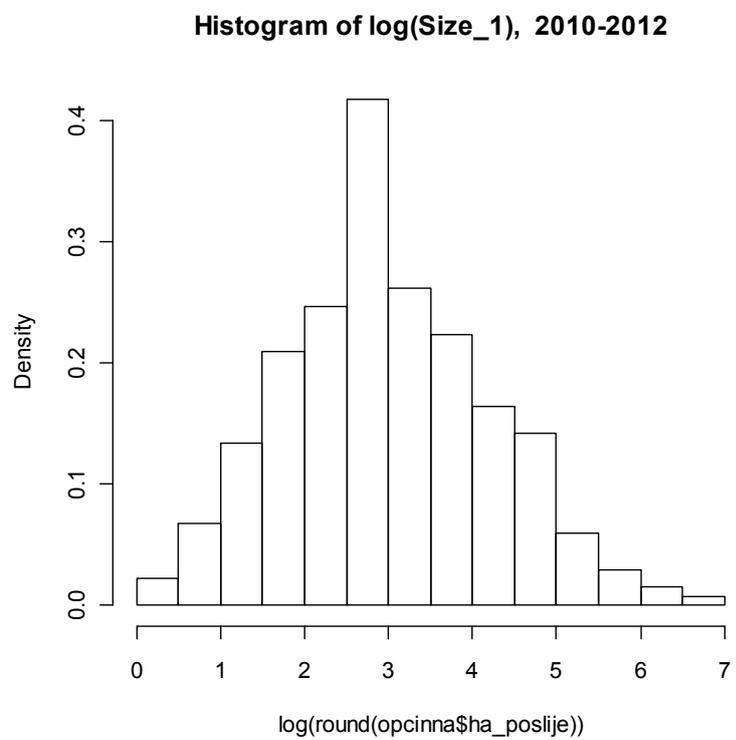


Figure 4

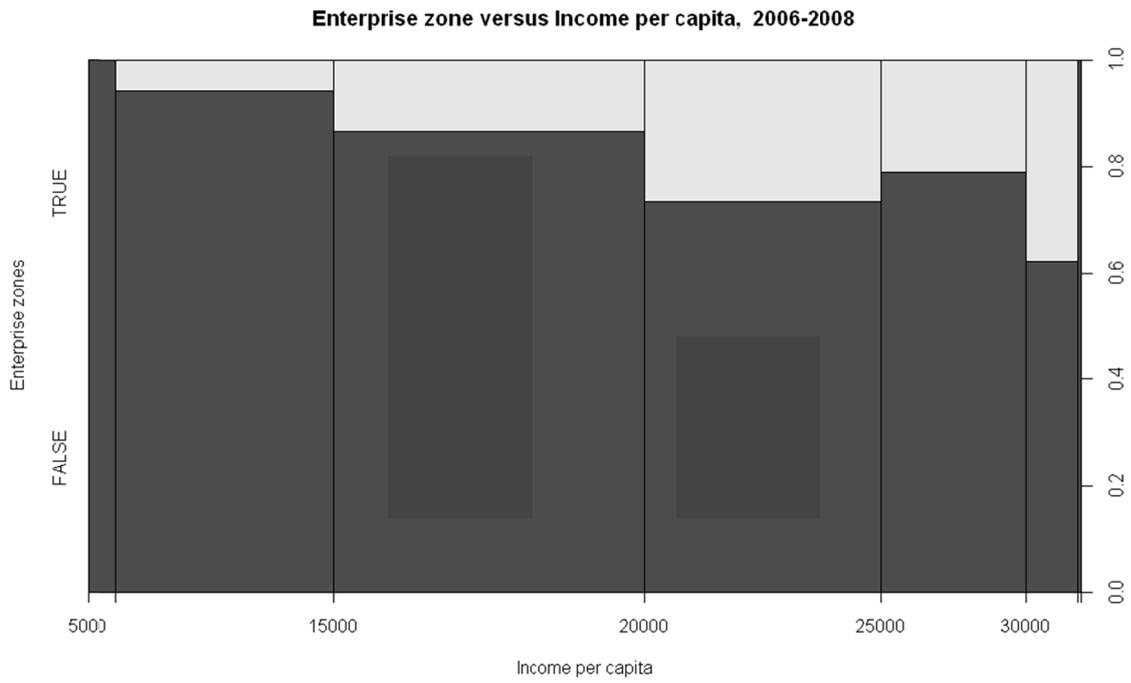


Figure 5

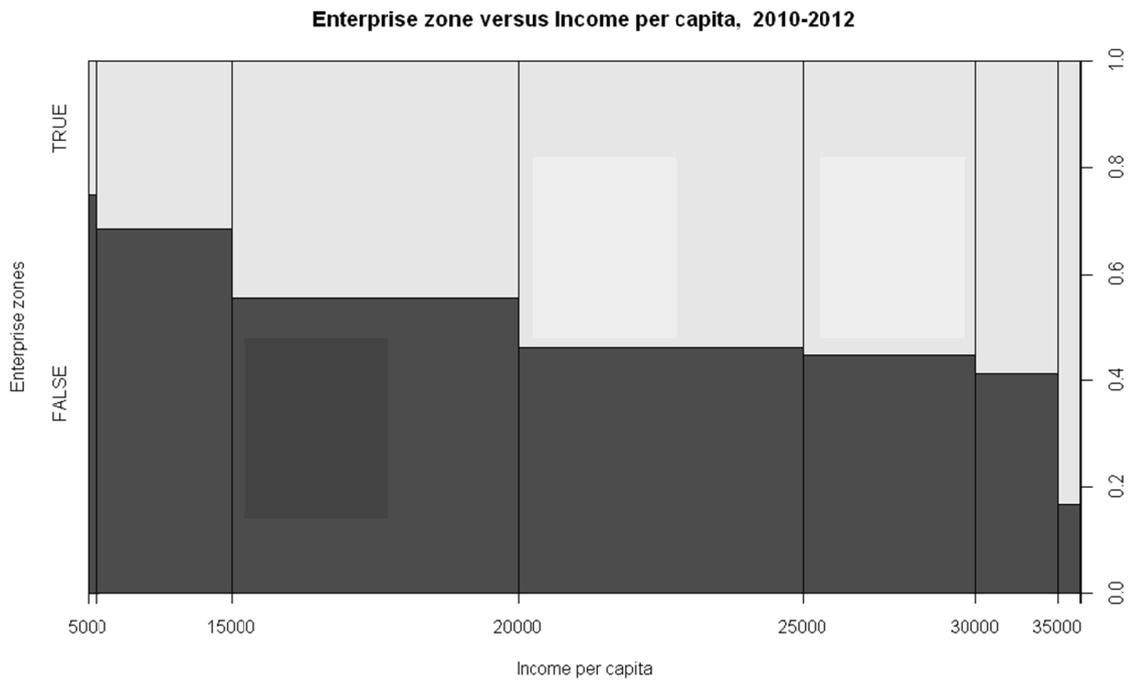


Figure 6



Figure 7

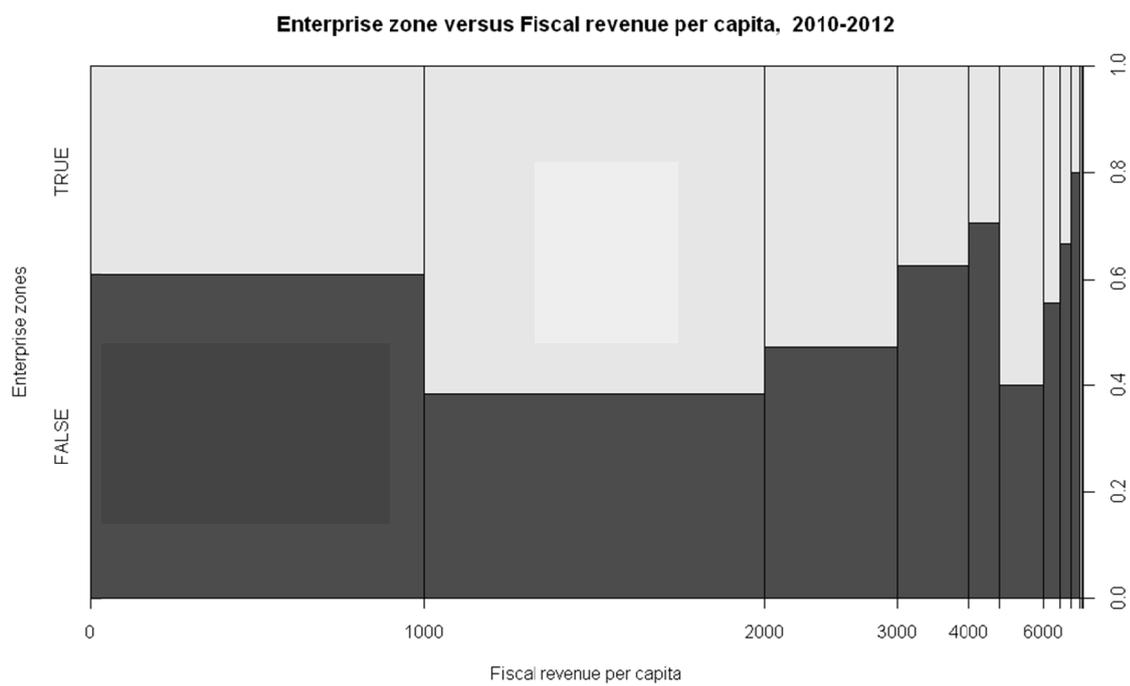


Figure 8

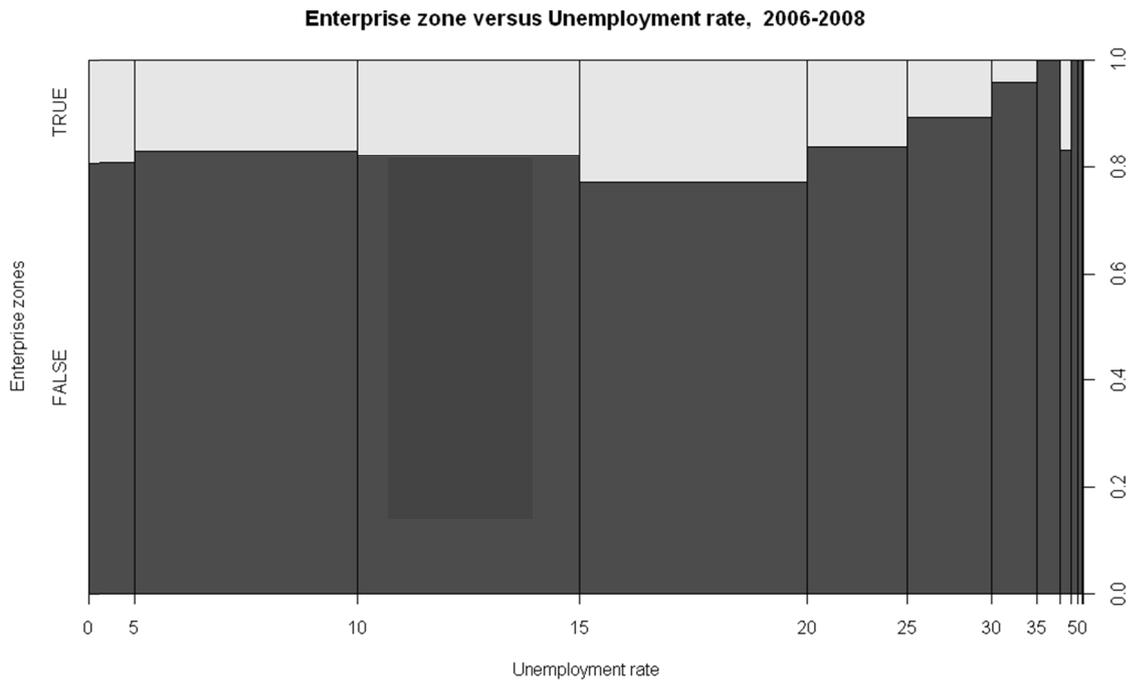


Figure 9



Figure 10

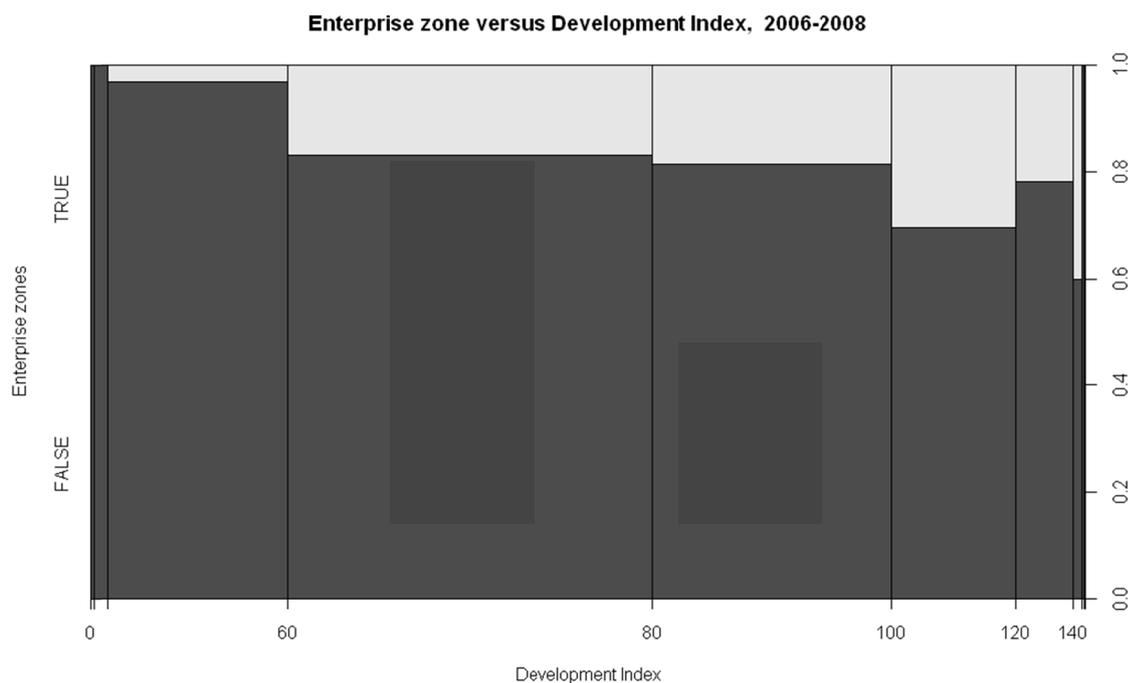


Figure 11

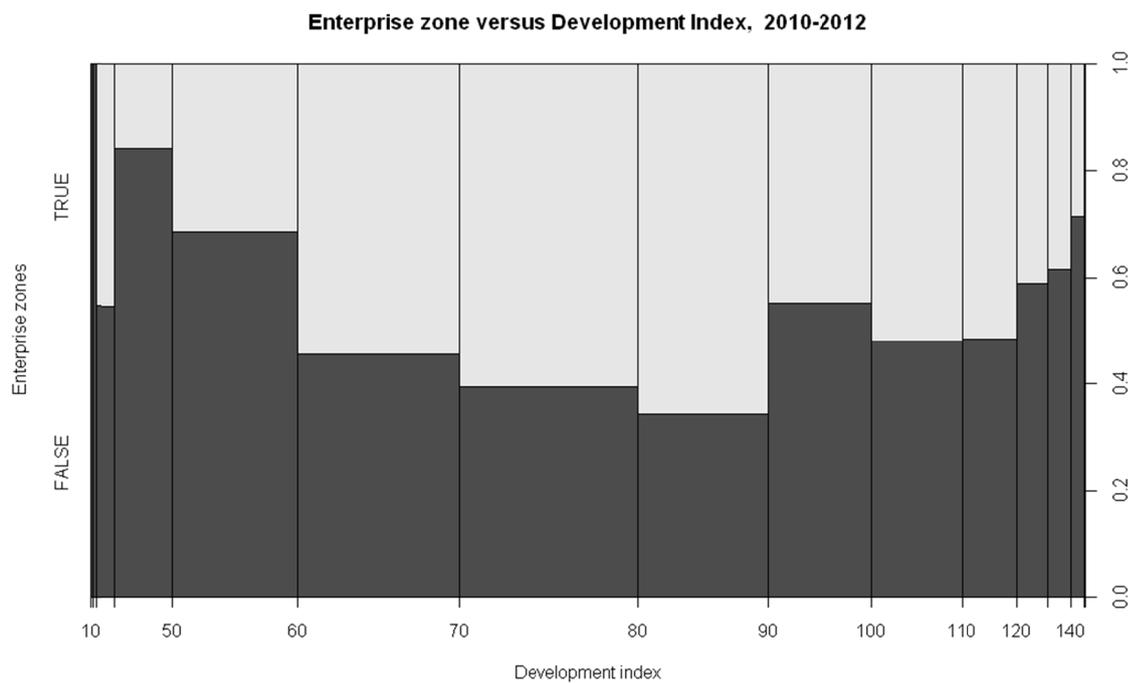
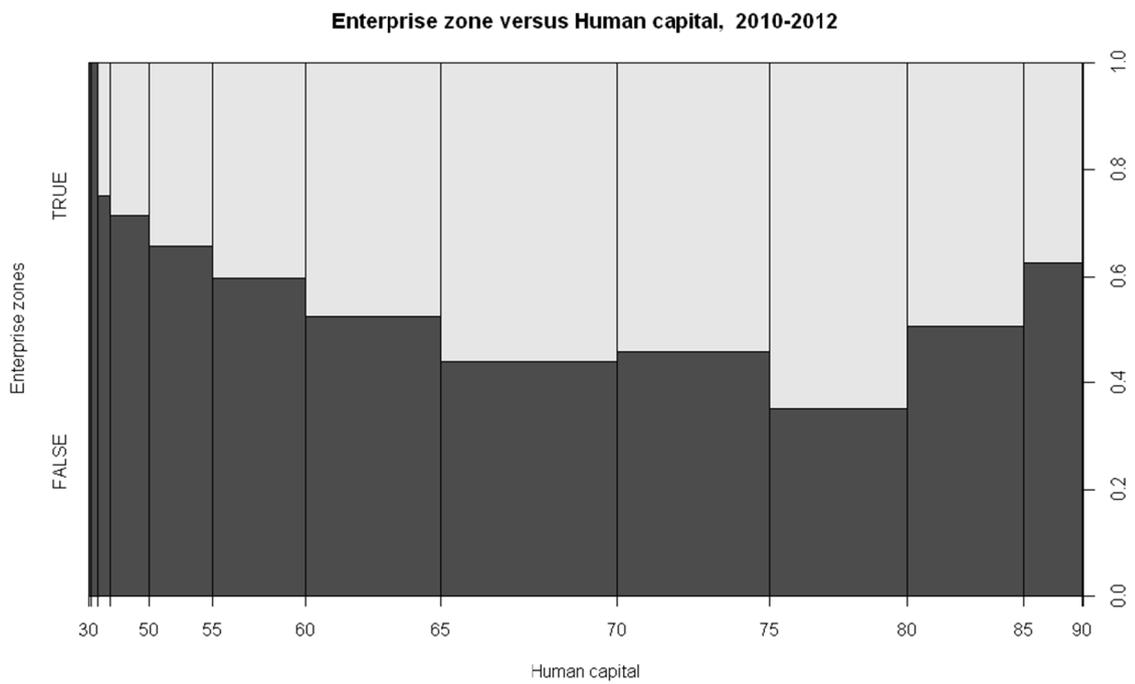


Figure 12



Figure 13



EVALUATION OF THE TOURIST RESORT STRATEGIC MANAGEMENT MODEL IN THE EASTERN ADRIATIC LITTORAL

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ABSTRACT

As opposed to the large tourist areas in the Mediterranean, eastern Adriatic littoral is characterized by the spatial boundedness on one hand and the diversity of valorised and potential tourist resources on the other. The misuse of that diversity is reflected primarily in the eastern Adriatic resort's orientation towards bathing tourism and the economies of scale. In addition, the collision between the necessary level of annual income of the hotel resorts and revenue generated by existing (standardized) business model, prevents the implementation of economies of scale. These facts represent a stimulus for the re-evaluation of the key variables of the tourist resort strategic management model, which reflects the research problem. Accordingly, the research focuses on the findings of the longitudinal research undertaken by the authors within the two year period (2013/2014). Based on those findings, a new, sustainable tourist resort strategic management model is proposed.

Key words: *model, strategy, management, tourist resort*

1. INTRODUCTION, PURPOSE & METHODOLOGY

In the Eastern Adriatic area, over the last decade, introduction of regulatory processes in spatial planning related to the (re)construction of tourist resorts resulted with an investment slowdown. These processes aid changes in trends of unplanned, irresponsible tourism construction. The current global tourism trends show increased interest for tourist visits to the eastern Adriatic coast and interest for holidays in the tourist resorts (Avraham, Ketter, 2008, 1338). The growth of the tourist industry based primarily on the major tourist resorts of the Mediterranean countries (Hall, Smith, Marciszewska, 2012, 317, 384, 418) has a negative impact to the competitiveness of the national tourist offer. Resorts often sustain economy of operations through the economy of scales. Investments are focused on the expansion of accommodation and primary board content (Butler, 2006, 237). The management of Mediterranean tourist resorts is characterized by standardized model of strategic management based on economies of scale and the promotion of mass tourism (Hall, Smith, Marciszewska, 2012, 317, 384, 418). Such model cannot be applied successfully in the tourist resorts located in the areas with geomorphological constraints for expansion of accommodation and beach facilities and services. Due to this fact it is necessary to re-evaluate the strategic management model of tourist resorts in this area. Customization of the standardized model, according to new tourism trends, contributes to the strengthening of competitiveness. On this basis, research in this field is useful for all tourist resorts in the Mediterranean and beyond (Evans, Campbell, Stonehouse, 2003, 241).

The number and diversity of commercialized and potentially usable tourist resources in the coastal areas of the eastern Adriatic represents the platform for sustainable and responsible tourism development. This has particular importance for maintaining the competitiveness of the tourism offer in zones with geomorphological constraints (Aqarwal, 2002, 25). Studies have shown that standardized tourist resort strategic management model does not give specific meaning to geomorphological constraints variable (Hall, Smith & Marciszewska, 2012, Seric & Lukovic, 2008). Eastern Adriatic area is characterized by hilly hinterland that, in some places, rises only few kilometers from the coastline. However, this area is also characterized by diversity and variety of tourism resources, many of which are not commercialized (Seric & Talijancic, 2009). Standardization of Mediterranean tourist resort strategic management model marginalizes the importance and utilization of such resources (Baxter, Kerr, 2010). Inadequacy of intensity and modes of exploitation of available tourism resources in the tourist resort environment have negative repercussions on competitiveness (Butler, 2006, 306). For example, standardized model ignores variable of historical identity of the environment which is particularly useful for the creation of specialized and diverse tourist offer. Such offer is an important catalyst of sustainable and responsible tourism development. Due to its impact on strengthening of the competitiveness of all subjects, it is recommended to implement it in the tourist resort management (Avraham, Ketter, 2008, 817, 860). The same is, often, not subject of interest of tourist resorts due to the unplanned development of tourism economy during the second half of the 20th century. Consequently, standardized model of strategic management is recognized in these areas today.

Standardized model is primarily based on economies of scale. This approach enables the use of a broader range of pricing policies in terms of seasonal business (Hall, Smith, Marciszewska, 2006). Price lowering of tourist offer does not allow the accumulation of capital necessary for the development of new facilities, particularly those that are precondition for developing year-round tourism (Evans, Campbell, Stonehouse, 2003). The consequences of low rates of accumulation are reflected in the mature stages of the life cycle of tourist

resorts (Butler, 2006). These examples are present and increasing in the Mediterranean area (Hall et al. 2012). Such tourist reality imposes the need for changes in the image management of receptive tourism entities (Seric, 2014). These facts served as a stimulus for research focusing on the re-evaluation of variables of the standardized tourist resort strategic management model in the Eastern Adriatic littoral.

Due to rising price competition, new tourism trends and unused resource potential in the eastern Adriatic coast, it is advisable to modify the standardized tourist resort strategic management model. Focusing destination offer primarily on beach tourism does not contribute to extension of the tourist season (Evans, Campbell, Stonehouse, 2003). Business optimization based on economy of scale ignores a number of criteria for responsible and sustainable tourism development (Fennell, Weaver, 2005). The negative repercussions of such approach are evident in terms of natural environment. There are also consequences to valuable cultural and historical heritage. These resources are one of the foundations of competitiveness in eastern Adriatic littoral. Negligent management of these resources generates negative publicity of the destinations and the country. Such publicity results in a decrease of interest from environmentally conscious tourist clientele (Pike, 2008).

Taking into account all the facts it is reasonable to conclude that the object of study, i.e. the evaluation of a standardized Mediterranean tourist resort strategic management model, with aim of its modification to the eastern Adriatic coast area, is encouraging for the research. The research problem is reflected in the fundamental research question:

Does standardized Mediterranean tourist resort strategic management model contribute to the tourist resort's competitiveness and season extension in the eastern Adriatic littoral?

Based on the above, the basic aim of this paper is to analyze the weaknesses of the standardized model in the context of the research question and, based on research results, propose improved model of tourist resort strategic management model. Accordingly, a longitudinal study was conducted during the peak tourist seasons in 2013 and 2014. The first phase of the research (preliminary survey, 2013) includes an analysis of financial records of selected tourist resorts, in-depth interviews with management representatives of those subjects, and exploration of perceptions and attitudes of guests of those resorts. The sample (N=1600) is composed exclusively of loyal guests visiting the resort for numerous years. They were offered participation in longitudinal research for a term of two years, for which the resort approved various benefits and bonuses. Based on the results of preliminary research upgraded tourist resort strategic management model was constructed. The questionnaire for the guests participating in the survey was also designed in order to test the new model. Testing of the modified model was conducted in the second phase of the study (primary research) during the peak tourist season in 2014 on a sample of 160 expert ratings obtained using the funnel and pre-test survey on a sample of 1600 guests from the first phase of research.

2. THE PRELIMINARY RESEARCH

2.1 Tourist resort and destination offer of the receptive market

Selection of competitive markets is of particular importance for the performance of the tourist resort (Pike, 2008). Traditionally, tourist market is called the *sellers' market*. This market is characterized by standardized offer, primarily in seasonal form. Market leaders are receptive

operators with large accommodation capacity. Such subjects are optimizing performance by means of economies of scale (Lewis, 2007). Competitive price with standardized tourist services are fundamental force of leaders. Different requirements and desires of new, as well as traditional tourist market segments over the last twenty years created a special market that can be called the *buyers' market*. These market standards of specialized tourism products and services are set exclusively by tourist demand. The competitiveness of supply depends on the match between supply and expectations of targeted tourist segment. The higher level of compliance with the expectations enables higher prices. The interest of the target clientele should be forecast, according to the current tourism trends (Evans et al., 2003). The tendency of year-round tourism offer development assumes positioning in the buyers' market. Resorts have an important role in this process. For this purpose it is necessary to modify the standardized tourist resorts strategic management model, since it has been tailored for the sellers' market (Pike, 2008).

2.2 Standardized tourist resort management model

What runs as fundamental thought through one of the first books that scientifically investigated the phenomenon of tourism (Krapf, 1955), is confirmed by many recent studies - tourist market is "sui generis" (market with specific characteristics). In that context we should observe differences between tourist market of sellers and buyers. The principal difference is the market focus. The focus of the sellers' market is on tourist industry, while focus of the buyer's market are tourists. Sellers' market defines the determinants of supply and pricing policy for certain products and services. The competitiveness of the tourism offer, including tourist resorts, significantly depends on standardization of supply and adaptation of pricing policies of the leaders. Standards of tourism promotion in the sellers' market restrict some promotional activities (Pike, 2008). These limitations are particular problem in an effort to encourage year-round visits. Optimization of the tourist resort position in the sellers' market implies the possibility of extending receptive capacity to reduce operating costs.

The success of positioning on the buyers' market depends on the accuracy of assumptions about the needs and expectations of targeted tourist segment (Pike, 2008). For this purpose, complex analytical approaches are required (Evans et al 2003). Since focusing on emerging trends and changing attitudes of wealthy tourist clientele is not a requirement for effective positioning in the sellers' market, the ability of standardized tourist resort strategic management model in the buyers' market is questionable. Research findings presented in this paper suggest that the standards in the buyers' market are determined bilaterally within the interaction between supply and demand. The model of strategic management of tourist resorts in this respect should allow and encourage this interaction. Each receptive entity can, in accordance with the vision and the resources available, create a specific integrated offer in order to stimulate year-round visits. Positioning in the buyers' market assumes specialization in order to ensure greater content differentiation. The process of tourist resort positioning on the buyers' market should start by redefining the standardized model of strategic management.

Accepting subordinate role in the sellers' market limits the positioning of tourist resorts on the desired emissive markets that function as buyers' market (Evans et al.2003). Adaptation of the tourist resort offer to the value system of the buyers' market connotes sustainable and responsible development of the tourism offer. At the corporate level, positioning the tourism entity in a buyers' market implies changes in the sphere of business and development policy. It is necessary to strengthen the synergy with the local environment (Pike, 2008). Resorts that

have no possibility to expand the capacity to preserve and increase market share may be based solely on the extension of the tourist season. In such scenario, continuity of development of specialized year-round tourism products remains necessary. The basic criteria for positioning in the tourism buyers' market are met this way. The tourist resorts strategic management model needs to be improved for such action.

2.3 The Mediterranean tourist resort strategic management model

In most Mediterranean tourist countries, tourist zones are located in areas without geomorphologic constraints and the expansion of accommodation facilities and supporting infrastructure represents no problem. Consequently, standardized tourist resort strategic management model adapted for sellers' market is established and practiced. It primarily offers seasonal tourism product. The growth of competition is matched by enhanced relationship of supply and prices. Optimization is performed with tools of economies of scale. The liquidity problem, generated by seasonal operations, seeks to be amortized by the maximization of tourist consumption. Such strategic commitment targets to concentrate tourist consumption within the tourist resort during the whole period of their stay. Depending on the size of the tourist resort there are minor differences in the strategic management of the resorts, but the underlying variables are shown in Figure 1.

Figure 1: Standardized tourist resort strategic management model



Source: own, based on research conducted by authors in 2013

Using the proposed model in practice is confirmed by preliminary research through four in-depth interviews with representatives of top management of four hotels in Croatia belonging to international hotel chains (Falkensteiner, Radisson Blu, Sheraton, Hyatt). Four hotel chains covered by this part of the research manage multiple resorts on the Mediterranean coast of Italy (Adriatic and Tyrrhenian Sea), France and Spain. Based on the collected information and corporate documents, it is evident that Mediterranean resorts, managed by these chains, are optimizing performance by increasing the accommodation capacity and expanding the non-board facilities. Their business strategy is based on economies of scale and simulations of the required tourist traffic in the main tourist season. Revenue growth in that period neutralizes poor occupancy in the remaining period of the year. Two of four mentioned hotel chains that

already operate in Croatia, still have not decided to take over resorts on the coast. Their principal argument for such emittance are limitations of spatial expansion in the future, due to the land ownership fragmentation and geomorphological complexity of the Croatian coastal region. These findings paved the primary research focus on the repercussions of management strategies of coastal resorts exclusively in the corporate sphere. The preliminary research proved that geomorphological specificity and fragmentation of land ownership in an environment of existing large resorts in the Croatian coastal, limit the implementation of standards of economies of scale. Strategic management model applied by 4 hotel chains implies standards of economies of scale in order to reduce business risks in circumstances of seasonal business. Is this fact the cause for which the InterContinental, the Ritz Carlton, JW Marriott, Grand Hyatt and other world famous chains do not show interest in taking the big hotels on the Adriatic? The aim of this work is not to provide the answer to this question, but to offer modifications to management strategies of hotel resorts in circumstances where the existing accommodation capacity and content cannot be augmented.

The model is characterized by insufficient focus on changes in the global tourism market. The rationale for defining tactical and strategic direction is modest (based only on SWOT analysis), in particular for defining the decision to position the tourist resort on the sellers' market. The management is aware of this momentum and directs promotional activities primarily (and often exclusively) towards the sellers' market. Findings of the benchmarking research of the authors (2009-2014) established the prevailing business objectives of tourist resorts that apply this model of strategic management: market share increase in existing source markets by adapting policy sales, maintenance of existing tourist image on the 4 P (product, price, promotion and sales) platform, strengthening the competitiveness by combining different pricing policies and the range of tourism products and identity management through activities of tourist resort brand management. Variables of the standardized model have limited, and the competitors have made predictable, marketing strategy that resorts practice: low cost strategy, limited type differentiation strategy and marketing mix adaptation strategies according to the sellers' market standards.

Tourism zones in the Mediterranean differ in accommodation facilities, infrastructure, resources, tradition and, especially, indigenous destination identity. Resorts in the eastern Adriatic have less accommodation capacity than average Mediterranean resorts. Restrictions of capacity expansion represent a problem if operations have seasonal character. Efforts to safeguard the share of traditional sellers' market generate annual revenue insufficient for balanced operations for resorts that operate seasonally. Due to these business realities modifications of tourist resorts strategic management model is necessary.

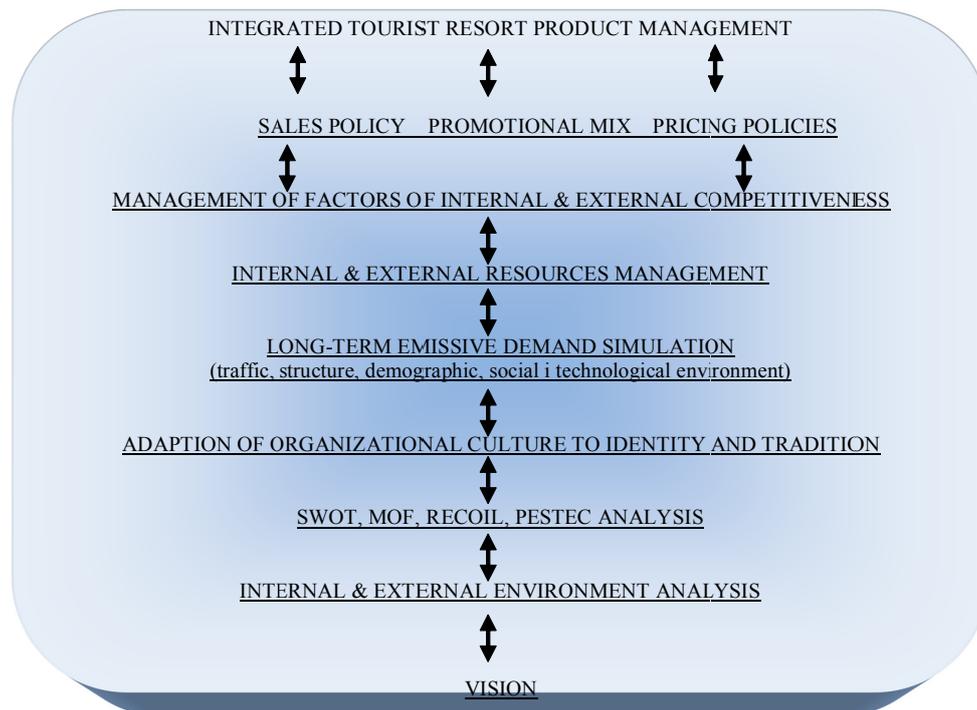
The four resorts (Murter, Split, Makarska & Dubrovnik) included in the research are characterized by similar model of strategic management and similar desires for improving the structure of guests and season extension. All four resorts surveyed have weathered the difficulties of transition and the global recession. Conducted segmentation and focusing on emissive countries, in accordance with the level of supply differentiation, ensure the position in the sellers' market which enables them to operate without losses even in conditions of recession. The ratio of permanent and seasonal employees is 40% to 60%. Their capacity reaches 500 beds, and more than 90% of annual turnover is realized by foreign guests. Decades of tourist experiences have standardized specific management and sales promotion policy. There is an evident growth in earnings, but it is still insufficient for the required investment in the expansion of mainly internal tourism offer. In the environment of all surveyed tourist resorts there are fully and partially utilized resources suitable for tourist

valorization. In this context, re-evaluation of strategic management model of resorts through (new) proposals of guidelines for its modification is essential in order to eliminate the detected weaknesses.

3. THE PRIMARY RESEARCH

Tourist resort strategic management model, directed towards year-round tourist visits implies a clear psychological differentiation of integrated tourism facilities. In most Mediterranean resorts that level of differentiation is not achieved. The result is mutual similarity of tourist offer from similar but also different countries. In such competitive clash competing is possible by pricing policies exclusively. Visibility of the tourist resort image is based on the effective implementation of environmental resources in integrated offer. Such approach allows co-branding of the tourist resorts with external resources in the environment. On this platform, tourist resort promotional mix can be optimized and managed. Effective promotional mix is created by diverse resources from the environment, rather than isolated internal identity of the tourist resort. The components of tourist resort strategic management model should allow effective positioning on the tourist buyers' market. Efficient management of the integrated tourist offer that has positioned resort's offer on the buyers' market is contributing to the growth of off-season visit. In eastern Adriatic, pleasant climate that allows swimming for 6 months annually is important prerequisite for this type of strategic orientation.

Figure 2: Improved tourist resort strategic management model



Source: own, based on research conducted by authors in 2013.

Findings of the preliminary study indicated that the focus in the design of the resort offer is based on internal resources. Those are adapted primarily for the main tourist season while resort's direct and indirect promotion highlights beach tourism. Marketing departments and management do not have the authority to design complementary, integrated tourism products that could attract visitors to periods outside the main tourist season. Neglecting of external factors in the environment of the resort and the destination to which the resort gravitates is

further underpinned by lack of more detailed methods of evaluation of resources in the environment. With aim to reduce seasonality effects for the business of resorts in the Croatian coastal region, it is necessary to modify the standardized strategic management model. Based on the findings of a preliminary research, improved tourist resort strategic management model has been proposed, expanded with additional variables, as shown in Figure 2:

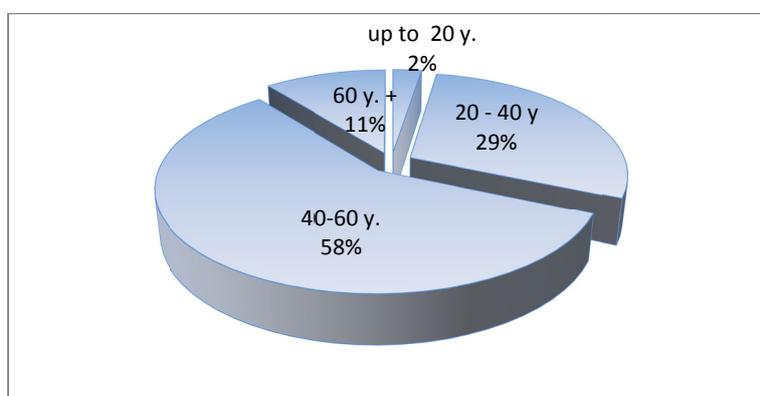
Proposed model was tested in the second phase of longitudinal study during the peak tourist season in 2014 on expert sample of 160 guests from the four tourist resorts. The findings of these longitudinal studies showed the lack of information among the guests of four resorts about potentially attractive facilities in the environment in periods outside the main tourist season, as well as their interest to visit the presented content of the wider environment in the off-season.

3.1 Findings of the primary research for the purpose of testing of the improved model

During the peak tourist season 2014, testing of the proposed additional variables for the improved tourist resort strategic management model, which due to geomorphologic and other restrictions cannot be achieved by extending the accommodation facilities but should strive for year-round operation, was conducted. In this study, the expert intentional sample of 160 guests (40 guests from each of the four resorts) was selected. The selections of the sample were executed on the basis of pre-test and funnel method on a sample of 1600 guests from the first phase of the research. The sample included guests from emissive countries that management of surveyed tourist resorts preferred. The criteria for the inclusion of individuals in the sample was interest in a variety of destination amenities outside the tourist resort and willingness to visit in periods outside the main tourist season if tourist resort offer included a diverse range of products and services.

The age structure of respondents is approximately in line with the age structure of the whole set. It is a population which should be offered active tourism products (identify and select resources in the external environment of the tourist resort, which can be used for the development of new tourist attractions and products, and to include the same in the various forms of active tourism - hiking, bicycle tours, kayaking etc).

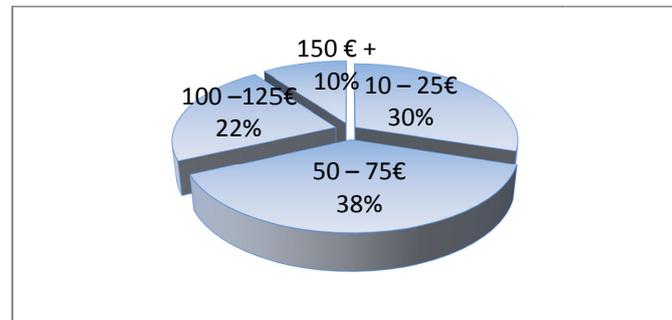
Graph 1: Age structure of respondents



Source: author's research 2014.

On the basis of additional daily consumption structure, it is evident the sample includes higher standard guests who spend in the periods outside the main tourist season if offered facilities and specialized tourism products. This observation indicates the need for more complex and detailed analysis with aim to the design new tourism products and expansion of the product range (inclusion of the MOF, RECOIL PESTEC analysis in the model).

Graph 2: The average daily consumption (€) of respondents during the stay in a tourist resort



Source: author's research 2014.

Educational attainment structure indicates the need for greater creativity in designing additional tourist attractions in order to foster the change of this structure in favor of more educated and wealthier clientele.

Table 1: Sample structure by educational attainment

Educational attainment	No. of respondents	%
Colledge diploma	32	20,0%
Bachelor degree	20	12,5%
High school	96	60,0%
Rest	12	7,5%
Total	160	100,0%

Source: author's research 2014.

As noted before, this pattern included guests in tourist resorts originating from countries which management evaluates as desirable, provided that the current structure of guests represent more than 1% on annual basis. Simulation of long-term emissive demand with aim to manage the guest structure is the variable which is of particular importance.

Table 2: Sample structure by emissive country

Emissive country of the respondents	No. of respondents	%
Italy	14	8,8%
Denmark	2	1,3%
Holland	5	3,1%
Czech Republic	32	20,0%
Germany	107	66,9%
Total	160	100,0%

Source: author's research 2014.

Concerning the research findings regarding the information acquisition about tourist resort offer, it is evident that marketing mix management should be in the function of an integrated tourist resort product management, and not the end in itself (promotion through tourism fairs). Priority should be internet marketing due to the potential of social networks (39.4% of respondents received the information from relatives) and information about tours through the web site (21.9%). Forcing this type of promotion implies synergy of promotion activities with the sales and pricing policies for different periods of the year (year-round tourism). Concerning the standardized model, sales and pricing policy are defined in an isolated manner, and are argued by marketing promotion of the tourist resort offer. In the modified model quality and content of the integrated tourism products determine the width of sales and pricing policies. Wider possibilities of combination allow more efficient coping with competition. Marketing mix management should also be elastic, in accordance with the changing price and sales policies, depending on the time of year.

Table 3: Sample structure by information source about the tourist resort offer

Information source	No. of respondents	%
Friends	63	39,4%
Media (press,tv)	4	2,5%
Internet	35	21,9%
Rest	58	36,2%
Total	160	100,0%

Source: author's research 2014.

Research findings indicate modest impression of the tourist resort before the first arrival. The result of using tourist resort strategic management model is evident. In this model, the role of promotion is defined by standards of the stay offers in the resort. Recent research on first impressions of guests of typical tourist resorts on the Mediterranean express significantly higher rate of disappointment. This is due to the potential difference of external resources of the (destination) tourist resort. This potential of many tourist resorts in the eastern Adriatic is insufficiently promoted through their offer, thus, limiting the price level. This finding points to the importance of the variables of analysis of internal and external environment of the tourist resort, and implementation of all destination resources in an integrated tourism product that is being promoted.

Table 4: First impressions after the first arrival in the tourist village

First impression	No. of respondents	%
Poor	15	9,4%
Good	40	25,0%
Very good	78	48,7%
Excellent	27	16,9%
Total	160	100,0%

Source: author's research 2014.

These findings suggest the usefulness of complex analysis of attitudes, opinions and desires of, especially, loyal visitors of the tourist resort. What contributes to the loyalty should be used in the development of pre-season and post-season content of tourist attractions. What loyal guests complain about should be rectified with aim of positioning in the tourist buyers' market.

Analysis of experiential components of the tourist resort offer provides guidelines for necessary improvements aimed at extension of the tourist season, but also at the introduction of premium price during peak season, due to the high rate of loyalty of existing guests. Experience components of the tourist resort offer surveyed guests evaluated in the ranking scale of 1 (poor) to 5 (excellent) as shown in table 5;

Table 5: Assessment of experiential components of the tourist resort offer

		N	Mean	Std. Deviation
Climate and weather conditions	Good/bad	15	2,73	1,831
	Good	67	3,99	1,297
	Good/excellent	58	4,48	0,682
	Excellent	17	4,76	0,437
	Total	157	4,13	1,220
Beauty of nature	Good/bad	15	2,53	1,457
	Good	67	3,93	1,185
	Good/excellent	58	4,34	0,807
	Excellent	17	4,47	0,717
	Total	157	4,01	1,163
Interesting historical and cultural monuments	Good/bad	15	2,47	0,990
	Good	66	3,44	0,930
	Good/excellent	58	3,55	0,753
	Excellent	15	3,53	1,407
	Total	154	3,40	0,973
Comfort accommodation	Good/bad	14	2,34	1,158
	Good	67	3,48	1,035
	Good/excellent	56	3,68	0,741
	Excellent	17	4,18	0,809
	Total	154	3,53	1,004
Courtesy of the catering staff	Good/bad	14	2,57	1,158
	Good	67	3,61	1,086
	Good/excellent	57	4,05	0,718
	Excellent	17	4,24	1,348
	Total	155	3,75	1,091
Courtesy traders	Good/bad	14	2,43	1,222
	Good	67	3,48	1,005
	Good/excellent	58	3,76	0,802
	Excellent	17	4,35	0,702
	Total	156	3,58	1,022
Sport and recreational facilities	Good/bad	12	2,42	0,900
	Good	63	3,33	0,916
	Good/excellent	48	3,23	0,928
	Excellent	17	4,00	1,061
	Total	140	3,30	0,994
Evening and night entertainment	Good/bad	12	2,33	1,073
	Good	57	3,02	1,142
	Good/excellent	49	2,90	0,895
	Excellent	17	3,59	1,372
	Total	135	2,99	1,113
Empathy of employees	Good/bad	12	2,75	0,866
	Good	65	3,48	1,213
	Good/excellent	55	3,95	0,826
	Excellent	17	4,65	0,493
	Total	149	3,72	1,090

Source: author's research 2014.

For hydro-meteorological conditions, the average score is very good. Score 1 (poor) gave 6.9% of guests dissatisfied with hydro-meteorological conditions, and more than 82% of guests are satisfied with these conditions (an excellent score was given). This finding indicates that most of the guests represent potential for visits in early and late season. It is necessary to provide them with facilities that will replace less swimming and sunbathing.

Comments praising the values of the landscape have very good average score and more than 94% of respondents are hereby satisfied. The development of new tourism products should be connected with landscape attractions as much as possible.

All age groups of respondents gave historical-cultural heritage good marks. This finding indicates a homogeneous views, it is also useful when creating new content and specialized tourism products. This assessment outlines insufficient information guests have about heritage. Therefore, a more aggressive implementation of destination identity in integrated tourism offer is recommended, especially if it fosters a year-round tourist offer.

The satisfaction degree of guests with accommodation is satisfying (very good), and more than 17% are very satisfied with it, while 3.2% of guests evaluated accommodation as 1 (poor).

Courtesy of the catering staff score has an average of 3.75 (very good) given by most of the guests, while 5 (excellent) score gave 27.2% of guests. The majority of guests are satisfied with the hospitality of retailers while 3.8% were not satisfied and gave a rating 1 (poor).

Guests are mainly satisfied with sport and recreational facilities, 46% of the guests gave a good grade. This data indicates the need for expansion of these facilities, especially the linking of the tourist resorts with amenities within the destination it operates in.

Guests are not satisfied with entertainment despite existing seasonal tourist events in the area. The average score was 3 (good). Most of the guests assessed this in low grades, and 23.9% of guests gave a score of 2 (enough).

The compassion (empathy) of service staff of the tourist resort was scored by guests as averaged (3.72). 3.3% of them gave a poor rating (1), 9.9% of the them gave sufficient score (2), 28.3% gave good (3) grade, 29.6% staff evaluated staff empathy as very good(4), and 28.9% graded it with 5 (excellent) score. Maintenance and improvement of these ratings can contribute to the adaptation of organizational culture, identity and tradition of destinations. The integration of these features is usable platform for the development of year-round tourism offer (experiences of destinations that have already been developed for all year tourism).

Satisfaction degree of guests during their stay in the tourist resort due to the deficiencies is shown in Table 6. Respondents have evaluated the satisfaction with individual content on a scale from -3 (disappointed) to 3 (excellent). The overall score is good (1.39).

Table 6: Satisfaction level of guests of the tourist resort related to a particular content

	N	Minimum	Maximum	Mean		Std.
	Statistic	Statistic	Statistic	Statistic	Std. Error	Deviation Statistic
Cleanliness	160	-3	3	1,09	,133	1,676
Architecture building and the environment	160	-2	3	1,56	,089	1,125
Opening hours of tourist facilities	160	-3	3	1,79	098	1,236
Office Hours Exchange	156	-2	3	1,71	,095	1,182
Time organized for entertainment	153	-3	3	1,07	,109	1,348
Informing guests about events	137	-3	3	1,14	,114	1,335
Valid N (listwise)	136					

Source: author's research 2014.

Scores of the tourist resort offer components suggest that it is necessary to improve the quality if it tends to compete in the buyers' market for the purpose of a year-round tourist visits. The average score that customers rated the degree of satisfaction with the overall tourist resort offer expresses satisfaction, but lower scores of individual components point towards the causes of seasonal business. The average scores of individual elements of the offer, such as cleanliness, information about events, entertainment, cultural and sport facilities etc. are lower than the average score of the total supply, which is a prerequisite for the stimulation of interest for staying in the tourist resort outside the main tourist season.

3.2 Conclusions in the context of testing a modified tourist resort strategic management model

Based on the research findings, the components for strengthening the competitiveness of the tourist resorts are presented in the following tables. Through such action conditions for new features are created, but risks that are reality of business practices of tourist resorts should always be in mind.

Table 7: Strengths, weaknesses, opportunities and threats appropriate for competitiveness strengthening

STRENGTHS	EXPLANATION
Beauty and diversity of landscapes in the region	Preservation of indigenous flora and fauna in the Surroundings of the tourist resort
Favorable climate conditions	Enable the prolongation of the tourist season
Tourism tradition	Experience and openness towards tourists
Indented coast	Attractive sea landscapes
Experience and hospitality	Preconditions for the quality upgrade of the tourism offer
Liquidity of operations and favorable image	Tourists resorts are attractive partners
Aquatorium	Development of the specialized tourists products
Traffic connections	Road infrastructure, air and naval ports
Cultural & historical heritage	Archaeological findings, sacral objects, fortifications folk heritage
Good working atmosphere	Satisfied employees, satisfied guests
Cuisine	Diversity in indigenous dishes and drinks
Certitude	High level of security for inhabitants and guests

WEAKNESSES	EXPLANATION
Existing staff	Deficiency of the expert hospitality staff
Inadequate structure of the tourism offer	Uniformed offer based on bathing tourism
Value for money	High prices of certain products and services in comparison with competitive countries
Horticulture	Need to arrange the green surfaces
Insufficient strenght of the electrical grid	Insufficient electrical power supply during high season
Overcrowding of the beaches in the surroundings of the resorts	Increase of the tourists outside tourist resorts
Modest retail offer in the store within the resorts	Narrow and shallow product range
Insufficient diversification of the tourist offer and insufficiently recognized image	Resembles the offer of other destinations on the eastern Mediterranean
Insufficient offer during night hours	Modest and uniform entertainmet program
OPPORTUNITIES	EXPLANATION
Creation of new products	Diverse resources as a basic for the creatin of new products
Accommodation quality upgrade	Rise of the integrated touris product quality, rise of the offer quality and tourist satisfaction
Development of the entertainment programs	Adjusment to the actual trends
Enlargement of the educative contents in the resorts	Beauty programs, detox programs, nutrition programs
Promotion of the cultural-historical attractions	Development of the specialized tourist products
EU membership	Co-funding programs
Sustainable development	Synergy of the tourism development with the social development and ecological sustainability
Indigenous products	Strenghtening of the perception of indigenous identity and tourist experience
THREATS	EXPLANATIONS
Competitiveness of the other tourist subjects	Receptive subjects in the destination and the surroundings
Visual pollution	Unplanned construction of the tourism infrastructure in the surroundings (dry marinas, parking lots, devastated objects, communal waste etc.)
Increase of the work force expenses	Rise of the integrated tourist product price
Slow adaptation to the modern tourist trends	Resistance to changes on all management levels
Inadequate legislative solutions	High VAT and other similar dues in comparison with the competitors
Recession, inflation	Negative impact on tourist supply and demand
Insufficient education of the employees	Necessity of education and adjustment to the offer standards
Unsatisfactory collaboration with the other tourism stakeholders in the surroundings	Problems in the relations with the local authorities
Working hours of the subjects in the outboard offer of the resorts	Unadjusted working hours of the supplementary content in the resorts

Source: Analysis based on the research of the authors, 2013, 2014

On the basis of the findings presented in Table 8, an overview of the current framework of the eastern Adriatic tourist resort offer is given (left side), and guidelines that need to be taken into account when positioning in the buyer's market. Surviving and maintaining the market share in the seller's market will be increasingly difficult and, in long-term, unprofitable mission given the capacity of much larger competitors in the Mediterranean.

Table 8. The Adriatic tourist resort, today and tomorrow

Tourist resort	
Today	Tommorow
Standardized traditional offer resembles other tourist resorts in the Mediterranean; Unused socio-cultural environmental resources; Business-oriented traditional emissive markets; Unfavorable structure of guests; Lack of quality offers for wealthy clientele; Outdated concept of supply management; Limitations due to infrastructure.	Necessary offer differentiation; Recognizable image and brand; Criteria of sustainable development; Emphasized specificity of the tourist resort; Management and development of offer quality; Qualitative improvement of accommodation capacities; Offer extension; Creative and empathic management.

Source: Analysis based on the research of the authors, 2013, 2014

For the realization of the objectives on the left side of the table 13 it is necessary to expand the marketing mix of tourist resorts, from 4P concept to 7P concept which includes partnerships with all stakeholders in the environment, procedural actions in order to encourage processes necessary for the development of tourism at the destination and, finally, integrated tourist progress whose dynamics should also be systematically managed. Tourist resort and destination passes their life cycles. They may or may not be controlled. For the control of the life cycle of the tourist resort development, presented model of strategic management can be used. By its application the following facts actual tourist reality are being accepted:

- Global tourism demand over the past periods shows significant qualitative and quantitative changes;
- There is a continuation of the intensive growth of supply compared to demand;
- Tourist destinations that reported profit growth, continue intensive work to strengthen differentiation, explore new segments and sub-segments in the global tourism market, introducing new content and new standards in accordance with the defined objectives and established trends;
- Strategic and tactical objectives of the tourist destinations offer are efficiently achieved on the destination management level;
- Marketing strategy based on 7P model is a prerequisite for a higher level of guest satisfaction;
- The satisfaction rating is usable starting point for the growth of tourism;
- Standards predicted by categorization of the receptive subjects are prerequisite for the positioning in the buyer's market, but do not provide sufficient competitiveness;
- Application 7P model is increasing with receptive operators in developed tourism markets.

Based on these insights tactical guidelines for tourist resort management improvement are proposed:

- i. Tourist resort should preserve and further emphasize natural, cultural, human and other values which strengthen differentiation of integrated offerings;
- ii. Continuously build the content and coordinate it with targeted tourism image;
- iii. Implement own outboard content in integrated destination offer;
- iv. Standardize all components of tourist resort strategic management
- v. Harmonize internal infrastructure of the tourist resort with the target image.

The implementation of these guidelines is possible through improved tourist resort strategic management model. We argue that potential contribution of additional variables in the model can be considered proven. Research findings point to the necessity of introducing radical changes in the management of tourist resorts in the eastern Adriatic. The proposed model is also usable for the activities of brand management. Application of improved model strengthens the destination icon and valuable identity components. This strengthens the perception of tourist resort offer quality. The same can have positive repercussions on competitiveness and offer recognition in a buyer's market. An alternative approach, based on the standardized model, which implies continuity of investment in the restoration of accommodation in order to maintain seller's market position, does not guarantee survival. Conducted research indicate the complexity of the problem of tourist resort management in the eastern Adriatic. Problems identified by research are result of the lack of cooperation between tourist resort management and other tourist destination stakeholders. On internal level of tourist resort management weaknesses in the field of project and crisis management and lack in the medium and long-term business planning were found. Tourist resort and destination should be coordinated in order to create an integrated tourism product. Development of specialized tourism products promotes the growth of interest of new guests and contributes to the loyalty of existing ones. Competing in the seller's market implies price competition. Lower prices do not provide sufficient accumulation, and it is essential to develop new specialized products within and outside the resort. In this regard it is essential to position in the buyer's market. For this purpose, modified model is usable. By applying the proposed model more accurate selection of available resources is enabled in order to create integrated year-round tourist attractions. This charts the guidelines for responsible and sustainable tourism development. Such development is needed to preserve biodiversity and evaluation of cultural and historical heritage.

4. CONCLUSION

The goal of tourist resort strategic management model is definition of standards of long-term satisfaction of guests. The guest should be provided with attractive facilities that contribute to the competitiveness of supply and strengthen loyalty. Achievable goals of tactical application of the proposed model are higher satisfaction in order to strengthen customer loyalty, increase emissive market share, enter new markets, custom 7P concept, increasing competitive advantage by expanding the range of internal and external offer, creating and maintaining a recognizable brand image, expanding the number of partners in receptive markets and sales channels in the emissive markets, adapting to marketing communications trends, growth of life quality within tourist destinations and responsible and sustainable way of managing resources of destination. Tactical objectives indicate aspiration towards continuous offer restructuring for maintaining positions in selected niche in the buyer's market. The components of improved model presume higher operating costs but also the potential for

revenue growth by season extension and the possibility of premium prices introduction for selected products and services.

Improved model reflects strategies of differentiation, innovation, brand management, sustainable and responsible development, 7P, vertical and horizontal integration and new relationships. These strategies enable effective and fast re-positioning which is a precondition for preserving the buyer's market share. Identified quality of tourism services determines the price that can be achieved, but also the overall occupancy rate. On those basis and with regard to the principal research question, we argue that *standardized model of tourist resort strategic management in the eastern Adriatic does not contribute to the tourist resorts competitiveness and season extension nor is optimal or adequate to potential resources and does not allow positioning in the buyer's market*. Transformation of tourist resort strategic management model connotes growing profits and tourist season extension. Knowledge that can be reached by using this model suggests the need for segmentation of the global buyers' market. To achieve this goal it is necessary to position the tourist resort in a buyer's market. Standardized model of strategic management is based on economies of scale and competitive price. Resorts with no possibility of accommodation optimization (upgrade) do not generate significant earnings in the seller's market. Low accumulation prevents investment in the development of additional specialized tourism products. Development of such products is a prerequisite for positioning in the tourist buyers' market. The rationality of such repositioning is realized exclusively on the buyer's market. On such markets, original and innovative components can be sold at premium prices. The implementation of all available resources in the offer creates an integrated, all year tourism product. Transport infrastructure exists; climatic conditions are favorable, it is necessary only to stimulate interest in the off-season. This intention would be achieved by using the 7P, instead of a standardized 4 P model.

Standardized model of tourist resort strategic management was tested in this research and guidelines for its adaptation to the standards of the buyer's market have been proposed. The research has identified weaknesses of standardized model for all tourist areas without possibility of enlarging the number of units. Research points that year-round tourist visits are based on a complex, integrated tourism offer. The integrated tourism product goes beyond the scope of the tourist resorts and the existing local competitors become partners. Our research has tested the impact and contribution of existing and preferred offer components in order to improve the strategic management model for the purposes of a year-round tourist valorization. Implementation of complex contents from resort surroundings is an important assumption of year-round visits. On the basis of improved model it is possible to classify components of the resorts offer.

The scientific contribution of the research is reflected in the analysis of the weaknesses of a standardized model and the guidelines for improved tourist resort management model in order to position in the tourism buyers' market. Improved model is practical for use in the area of eastern Adriatic but, also, in all other tourist areas where geomorphologic and other restrictions prevent capacity expansion. Research findings represent answers to dilemmas related to the possibility of implementation of existing and potential tourism resources in integrated offer. On that basis it is possible to co-brand of the resorts with the contents in the environment. This strengthens the competitiveness and stimulates interest in new tourism segments.

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MARINE LITTER MANAGEMENT IN FISHERIES SECTOR IN CROATIA: SOCIAL INNOVATION FOR CIRCULAR ECONOMY

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ABSTRACT

Circular economy and social innovation are increasingly being recognized as elements of a new paradigm emerging in response to ongoing global development and governance crises. The European Commission proposed ambitious programme towards a circular economy, including an aspirational target of reducing marine litter by 30% by 2020 (EC, 2014). Abandoned, Lost or Discarded Fishing Gear (ALDFG) management and Fishing for Litter (FfL) are practices through which fisheries sectors can contribute to the prevention and removal of marine litter, i.e. to zero waste environment and more circular economy. The analysis of the situation in Croatia shows that their introduction would result in triple win scenario, with: strengthening of recycling sector; decreased pressures on environment and biodiversity; modernized and more sustainable fisheries sector. An analysis of the governance within the sector suggests that social innovation approach is not only preferable to command and control approach, but the only feasible approach. A set of recommendations for the introduction of the two practices is proposed, based on the customization of the established best practice in social innovations for environment in the Croatian fisheries context.

1. INTRODUCTION

A conceptual framework of circular economy has recently become one of the main strategic guides in thinking about the future of the EU economy (EC, 2014) (EREP, 2014). Similarly, there is also a growing recognition and expectations from social innovations as an approach to addressing social needs in the context of ongoing crises and failing old models (BEPA, 2010) (BEPA, 2014). Their significance in the EU policy framework reflects in the fact that they are both supported by the Flagship Initiatives of the Europe 2020 Strategy (EC, 2011a) (EC, 2011b).

Marine litter has recently become increasingly recognized as a growing global environmental issue requiring more attention and efforts for its tackling. The topic entered EU environmental policy framework as one of the eleven descriptors of Good Environmental Status (GES), within the EU Marine Strategy Framework Directive (2008/56/EC), which aims to achieve GES of the EU's marine waters by 2020. A recent EC Communication Towards Circular Economy (EC, 2014) includes the proposal for aspirational target of reducing marine litter by 30% by 2020 for the ten most common types of litter found on beaches, as well as for fishing gear found at sea.

Croatia as EU member state has an obligation with regard to all the above listed policy frameworks.

This paper investigates the opportunities for more circular economy in Croatian fisheries sector, through the introduction of practices contributing to more recycling and less marine litter, while recognizing that the most feasible way to do that is through social innovation approach and methods. The objective is to catalyze and educate desired sectoral changes by insights from the two conceptual frameworks with the central status in EU policy framework, thus contributing to their effectiveness and efficiency.

The paper starts with the presentation of the concept of circular economy and a review of the level to which reducing marine litter by management of abandoned, lost or discarded fishing gear and fishing for litter support the development of circular economy approach in fisheries, based on Croatian case study. The second part of the paper deals with social innovation approach to environmental challenges and identifies the key success factors for social innovation. The two serve as a point of departure for formulating recommendations for practices which would result in strengthening recycling sector, decreasing pressures on environment and biodiversity and modernising the fisheries sector.

2. CIRCULAR ECONOMY

2.1. The concept

The idea of a more circular economy – i.e. an economy which resembles “zero-waste” Nature’s operations, where all material outputs from processes get used as input resources to some other processes – has been around in the contexts of various proposed frameworks since the birth of the environmental movement in 1960s. Some of the best known examples include: The Economics of the Coming Spaceship Earth (Boulding, 1966) and The Potential for Substituting Manpower for Energy (Stahel & Reday, 1977), commissioned by European Commission, explaining, in the EU context, already in the late 70s, circular economy’s intrinsic potential for the creation of new jobs, energy savings and waste prevention; and

more recent conceptual frameworks, such as Industrial Ecology, Cradle to Cradle, Biomimicry and Blue Economy, that further developed the general idea.

The concept got made its way in the main development strategies and policies at the turn of the century, including Japan's circular economy initiative (Davis, Hall, 2006), China's 11th five-year plan (Feng & Yan, 2007) and more recently within the EU (EC, 2014). This development is driven by, on one hand, prolonged and still unresolved economic crises and widening suspicion regarding the viability of the current linear take-make-consume-dispose model, and on the other hand, by the appearance of more convincing quantitative analysis demonstrating economic and business case for transition to a new restorative, circular model. In the EU context, these were arguably three reports recently issued by the Ellen MacArthur Foundation (McKinsey & Company, 2012, 2013, 2014).

The key rationale behind the idea was compellingly conveyed by the EC Environment Commissionaire in his remark that "there is gold in waste, literary.... (as) ... it takes a tonne of ore to get one gram of gold (while) you can get the same amount from recycling the materials in 41 mobile phones" (Potočnik, 2014). However, the list of benefits is much longer, with structural contributions to economy competitiveness, the reindustrialization of the EU economy with the creation of new jobs and competencies and decrease in pressures on environment and biodiversity. It is estimated (EC, 2014; EREP, 2014) that realistically achievable transition towards more circular EU economy – with recycling rate raised from the current 42% to 70%, and 30% improvement in the resource efficiency by 2030 – would create 2 million new jobs, 20% reduction in total material requirements and 1% boost to GDP. These numbers seem too convincing to be ignored, especially in the mid and long term, as the global trends are such that the case for shift to circular economy only becomes stronger. Consequently, an explanation for recent withdrawal of the circular economy package (EC, 2015) stating that it will be "replaced with more ambitious legislation in 2015" (EC, 2015) is most probably genuine, especially considering that already this temporary postponement provoked strong protests both within the European Parliament and among EU MS.

2.2. Marine litter and fisheries sector

Although marine litter (ML) – i.e. "any persistent, manufactured or processed solid material discarded, disposed of or abandoned in the marine and coastal environment" (UNEP, 2009) – has been rather visible form of pollution for a long time, it has come into the focus as a serious global environmental threat relatively recently – arguably since Capt. Charles J. Moor brought public attention to it by his 1997 article describing his encounter with the Great Pacific Garbage Patch. It is now well established that ML threatens marine environment and ecosystems by harming many marine species including birds, turtles, mammals, fish due to entanglement, ingestion, covering and by serving as vector for transfer of pollutants and NIS. It presents human health threat through the potential impact of micro-plastics ingested by marine fauna consumed later on by humans, POPs, sharp litter on beaches. Finally, it also damages economy, primarily sectors of tourism and fisheries. Hall (2000) estimated that total economic losses on Shetland Islands – a relatively small touristic area in Scotland, with population of 20.000 – caused by ML are up to £5.6 million per year. Tourism is also the main source of ML in the regions with developed tourism. It is estimated that up to 50% of ML in the Mediterranean comes from tourism related activities.

Fisheries sector is arguably the second most important sector, with regards to ties with the ML. It is directly negatively impacted by ML through degraded fish stocks (primarily by

“ghost fishing”¹ and degradation of habitats), wasted fishing time on cleaning ML caught in the fishing gear, snagged nets on ML on the seafloor, navigation hazard and damaged vessel parts (fouled propellers and blocked intake pipes). Recent study estimated the total cost of ML impacts on Scottish fisheries at 5% of its total revenue, or in average £15.000 - £17.000 annually, per vessel (Mouat et al, 2010).

Fisheries sector is also a significant source of ML, including Abandoned, Lost or Discarded Fishing Gear (ALDFG), made of synthetic materials that can last decades before degrading in micro plastics, expandable polystyrene (EPS) boxes, ropes, buoys, garbage from vessels, etc. Macfadyen et al (2009) estimated that only ALDFG – which is especially harmful – makes up around 10% of all marine litter.

Finally, fisheries is also a sector which can contribute to the removal of ML, as fishing activity unintentionally also collects ML from marine environment.

2.3. 3Rs in fisheries sectors

3Rs (standing for reduction, reusing and recycling) are in the core of circular economy.

There are two main types of measures that transform fisheries sector towards more circular “zero waste” economy: the minimization of various organic waste (e.g. bycatch avoidance and management, reusing of organic waste created in fish processing); and the minimization of non-organic waste streams associated somehow with fishing practices. Clearly, the latter are of direct relevance for the ML issue.

Taking into account the level of damage caused by ALDFG, the single most important ML prevention measure in the fisheries sector is the introduction of effective ALDFG management framework. The ultimate measure would be transition to the fishing gear made of biodegradable materials. In the meantime, the framework should include: onshore collection of the fishing gear at the end of its life cycle, fishing gear marking, the promotion of fishing practices that minimize chances for losing fishing gear, reporting on lost gear, the establishment of the registry of ALDFG, the removal of ALDFG from the sea, the recycling and recovery of collected ALDFG. Namely, the recycling of the materials of which the nets are produced – Polyethylene (PE), Poly Amide (Nylon) (PA), and Polypropylene (PP) – is already well established technological process that generates materials used for the production of carpets, socks, swimmer, fabrics used on car seats, etc.

The second practice by which fisheries sector can contribute to the mitigation of ML issue is the collection and organized disposal of “ML by-catch” – i.e. so called Fishing for Litter (FfL) practice. The oldest and most experienced FfL initiative within the EU is the one initiated by NGO KIMO among the fishermen in Netherlands, Scotland, England, Belgium, Denmark and Sweden. The established scheme is quite simple. Fishermen voluntarily collect ML they catch into their fishing gear, temporary dispose it on-board in big bags that they receive for free and, once back in their fishing port, land it onshore. Fishing ports secure the space and infrastructure for temporary disposal of collected ML. Further processing of collected and landed ML is done by existing onshore waste-management system. As an illustration, FfL project that run in Scotland in period 2008-2011, with the budget of around £200.000, managed to involve 162 fishing vessels, 17 harbours, and collect 242 t of ML

¹ Ghost fishing is prolonged catches of fish and other animals, including turtles, seabirds, and marine mammals by ALDFG, although nobody is actively operating the gear.

(KIMO, 2012). On average, a fishing vessel collected 10 kg of ML per week, which is clearly not much of a burden and impediment to its regular fishing operations. Although this is currently commonly not the case, it is conceivable that fishermen get some compensation for their "ML cleaning" activities, from some fund filled in by the "polluters", in which case, FfL would also become a way of diversification of the fishermen incomes.

EU fisheries policy framework has already introduced provisions supporting the establishment of both ALDFG management systems and FfL practices. E.g. Council Regulation (EC) No 1224/2009 stipulates fishermen's responsibilities and procedures in case of the lost fishing gear. Commission Implementing Regulation (EU) No 404/2011 specifies the responsibility for marking and identification of fishing gear. EU Regulation No 508/2014 on the European Maritime and Fisheries Fund (EMFF) stipulates that "the EMFF may support ... collection of waste by fishermen from the sea, such as the removal of lost fishing gear and marine litter". Regional Plan on Marine Litter Management in the Mediterranean (UNEP/MAP, 2013) obliges contracting parties to Barcelona Convention to "explore and implement to the extent possible the Fishing for Litter practices ..." by 2017. EU Strategy for Adriatic-Ionian Region foresees ML-related measures and guardians of the sea initiative (Vella, 2014). The EU aspirational target of reducing marine litter by 30% by 2020 (EC, 2014) applies also to ALDFG. However, as majority of these are relatively recent developments, their realization is still in early stage, practiced on voluntary bases by more progressive and environmentally aware pioneers.

2.3. Croatian fisheries sector

Fisheries contribution to Croatian GDP is estimated at 0,2-0,7%, if only fishing, aquaculture and fish processing industry are taken into account, or around 1%, if all the other associated activities are included (RH, 2013). Despite this modest contribution, it is an important sector for Croatia, as it is a part of the tradition and an important employer, especially outside the core touristic season, in coastal and island communities, and positive contributor to the balance of trade.

Estimates on capacities and activities within the sector are as follows. Total number of employees in the sector is around 10.000 (without 10.000-13.000 involved in small subsistence fisheries), out of which 7.000 in fishing and the rest in aquaculture and fish processing. Only around 1/3 of the total value of fisheries comes from fishing, which implies low productivity and traditional character of the activity. The fishing fleet includes over 4.000 vessels (without vessels used for small subsistence fishing), with gross tonnage of 45.000 GT and total engine power of 325 kW (which is around 2.5% and 4.5% respectively, of EU fishing fleet, relative to Croatia's around 0.9% share in EU population). Over 80% of 4.000 vessels and 50% in total engine power of the fleet are vessels with length bellow 12 m. Almost 50% of vessels are registered for various fishing practices (which is typical for the Mediterranean). Total catch varies from around 50.000 t (e.g. in 2008 and 2010) to 70.000 t (in 2011): over 85% caught by circa 300 vessels using surrounding nets (primarily sardines and anchovies); less than 10% by circa 500 trawlers; and only 1-2% by circa 1.500 vessels using gillnets and entangling nets. Catch is currently landed in 264 landing ports, over 95% of which in 20-30 major ports (Vrgoč, 2012) (RH, 2014) (Defishgear, 2015).

Governance within the sector is dominantly traditional top-down, command and control, i.e. regulation and enforcement type. Such approach is very demanding on the inspection and enforcement, due to the large number of actors, the dispersion of activities within the vast

area, and the fishing tradition of using many fishing gears and targeting different stocks. The consequence is that existing inspection and enforcement capacities are chronically weak and insufficient and the level of non-compliance relatively high. It is estimated that up to 30-50% of the trawlers catch is not accurately reported (Defishgear, 2015). There are also activities dealing with fishermen awareness raising and education regarding the importance of compliance for sustainability of the sector and their own future, however, these are still perceived even among their proponents and implementers as supplementary, soft governance measures, with very limited potential to influence outcomes.

2.4. Impacts of 3Rs on Croatian fisheries sector

An annual ALDFG from fishing activities with nets in Croatia is estimated at 25 t (Defishgear, 2015). There are couple of hundreds spots that fishermen are aware of, on which nets get snagged and lost more frequently, as they are very attractive fishing sites with morphology that pose high risk of entangling and snagging. An amount of fishing nets annually reaching the end of the life cycle, being replaced and disposed onshore is estimated at 170 t.

Currently there is no systematically organized neither removal of the ALDFG from the sea nor selective collection of end-of-the-life-cycle nets for recycling. In addition to pilot activities organized within the Defishgear project, there were a couple of ALDFG removals organized in the last couple of years as awareness raising events by several diving centres. There were also a couple of instances of recycling company buying nets (altogether a couple of tons) for recycling.

Arguably, current situation justifies the initiation of systems which would secure sound management of these waste streams. It primarily includes the establishment of a system for selective collection of end-of-the-life-cycle nets, as this would increase feasibility and attractiveness of recycling. Namely, as demonstrated by a couple of reported instances, the interest for old nets as material for recycling exists, total estimated quantities also justifies it, but current barrier is the cost of collection which is prohibitively high if it has to be done solely by recycling operators. However, the establishment of network of spots for selective collection would practically eliminate this cost. With regard to ALDFG, potential measures include primarily awareness raising on environmental consequences of ALDFG, the promotion of practices preventing it, the establishment of registry of ALDFG and removal activities – focusing primarily on the spots which have both high concentration of ALDFG and high value as habitats for stock regeneration and for marine biodiversity in general (e.g. reefs and ridges, but also shipwrecks which function as artificial reefs).

The establishment of the system would benefit not only environment (by decreasing ghost fishing) and the recycling sector of economy (by creating new job opportunities), but also the fisheries sector itself, which should be especially emphasized when communicating the idea to fishermen. Namely, it would save fishermen from all the known negative impacts of ALDFG, and also raise sector's sustainability by increasing its modernity and capability for functioning within the EU policy framework.

Currently, there is no organized FfL practice and supporting infrastructure, with the exception of the pilot activities initiated within the Defishgear project (Defishgear, 2015). However, based on interviews (Defishgear 2015), FfL has already been practiced by a portion of fishermen, especially when encountering larger ML on which they snag their nets, while some

of them collect also smaller ML (plastic bags, etc) caught in their nets, and dispose it in regular communal waste collection infrastructure back in ports.

Survey among fishermen on ML quantities as a bycatch in the nets revealed that required additional activities on the side of the fishermen joining FfL initiatives would not be overly demanding – namely, temporarily depositing and landing onshore, in designated areas within the fishing ports, 10-20 kg of ML per week (not including extra-large ML pieces, which are more sporadic events) (Defishgear 2015). Required onshore infrastructure is just an additional standard waste collection container dedicated for ML, within the designated area in the fishing port area. Required surface is minimal, and should be next to other existing waste related infrastructure, including a container for selective collection of old fishing nets. The cost of equipping a fishing port with such an infrastructure is a couple of thousands Euros. Finally, FfL would not put significant burden on existing onshore waste management system, as the total annual amount of collected ML – even for the completely mainstreamed FfL, with all vessels participating – would be around 1000 t, which is around 2‰ of the amount of the MSW currently generated within the Croatian coastal area.

On the other hand, there are multiple benefits. Clearly, it would be beneficial for environment. Although in its pioneering phases the amount of removed ML may not sound impressive – e.g. annual amount of ML collected in reasonably developed KIMO FfL activities in Scotland is around 80 t, which is 4‰ of estimated 20.000 t of annual ML load into the North Sea – it is estimated (OSPAR, 2007) that if mainstreamed within the sector, FfL can realistically, in very cost-effective way, significantly contribute to the solution of ML issue, by removing around 10% of annually generated ML, which is comparable with the percentage removed from the beaches (if these are regularly cleaned), as the estimates are that around 70% of ML ends on the sea floor, 15% floats and 15% ends washed up on the beaches. Besides, FfL is removing ML from the sea floor, which cannot be removed in other way. As continual removal of ML caught within some area makes that area cleaner and therefore more appropriate for fishing activities, without nuisance caused by ML (snagged nets, cleaning of nets), FfL is also beneficial for the fisheries sector itself. Finally, it would also significantly improve both the image of the fishermen within the community and their self-image, as net contributors to the common good.

Regarding the preferable way of implementing these two systems, it is well established that behavioural change of the key stakeholders is a prerequisite for effective enforcement of enacted ML related legislation (UNEP, 2009) (OSPAR, 2007), i.e. that effective ML management requires some combination of legislative binding instruments and non-binding “soft” mechanisms, such as voluntary agreements and environmental awareness raising initiatives (Kershaw et.al, 2013). Further on, Pomeroy and Douvere (2008) emphasised that stakeholder participation and empowerment are critical for achieving sustainable marine environment and marine litter management policies. Consequently, and especially in the context of current governance challenges in Croatian fisheries sector, it is clear that preferable mode for the introduction of these two practices is not one relying on strict regulation and in reality impossible enforcement, but an approach which for its efficiency and effectiveness relies on stakeholders themselves – engaged, informed and thus aware of their co-responsibility for the outcome, less regulated and inspected and more empowered to work together in their best interest.

3. SOCIAL INNOVATION APPROACH TO ENVIRONMENTAL CHALLENGES

3.1. Social Innovations Movement

The concept of social innovation has been a common element of major social scientists studying a societal change. However, more recently, the term has been used for a variety of initiatives and activities, dealing with almost all areas of societal wellbeing, which can be described as “innovations that are social in both their ends and their means (...) new ideas (products, services and models) that simultaneously meet social needs (more effectively than alternatives) and create new social relationships or collaborations (...) innovations that are not only good for society but also enhance society’s capacity to act” (BEPA, 2010). Social innovations are addressing not only social demands, but also their underlying causes on the level of societal and systemic challenges. Namely, with regard to its drivers and objectives, social innovations can be divided in: 1) grassroots initiatives addressing urgent social demands of vulnerable groups; 2) initiatives addressing broader societal challenges, directed towards society as a whole, with both social and economic aspect; and 3) systemic initiatives that propose fundamental changes in attitudes, values, strategies, policies, institutional set-up, activities and services, seeing society as “a more participative arena where people are empowered and learning is central” (BEPA, 2010). Observed in the wider context, it is clear that recent fast growth in number of social innovation initiatives and increasing popularity and centrality of the concept (EC, 2011a) – that is rightfully labelled as social innovation movement (BEPA, 2014) – is driven on one hand by growing and converging social, societal and governance challenges associated with multitude of ongoing crises – from the most general one related to (un)sustainability of the mainstream eternal growth model, to more concrete one dealing with the unemployment, inequality, social exclusion, lack of social cohesion, aging, welfare state, healthcare, pension and educational systems, biodiversity, environment, energy and climate, all that in circumstances of the growing budgetary constraints – and no effective solutions and convincing proposals coming from the old models and institutional establishments, and on the other hand great belief in the power of human innovativeness, and realization that new solutions require engagement and participation of all concerned social actors, investment in eroded social capital and renewed social contracts. In other words, in the circumstances of the growing crises and societal challenges combined with the harsh budgetary constraints, social innovations are attempts to address challenges in a way that will be less costly and more effective by relying on changed governance, with more emphasis on participation, empowerment and shared responsibility for the problem solving.

Social innovations have a prominent place within the EU policy, programmes and instruments, being firmly built into Europe 2020 strategy, its’ Flagship initiatives, Multiannual Financial Framework for 2014-20 and its programmes and instruments, both within the more directly related policies and programmes – such as Innovative Europe Flagship Initiative, or research and innovation fund ‘Horizon 2020’, and the Employment and Social Innovation Programme – and as an important dimension within all EU policies and programmes. The objective is to move “beyond the expanding myriad of small initiatives and projects with limited results – as successful as they are – to achieve a real systemic change that puts social innovation at the heart of all processes and policies” (BEPA, 2014).

3.2. Social Innovations in addressing environmental challenges

Social innovation appears to be very natural approach in the domain of environmental challenges (SCUUWEB, 2014). Arguably the main reason is that social innovation commonly

includes societal or behavioural shifts based on the new awareness and reframing of the problem. This is the most efficient and effective solution to environmental problems caused by the stakeholders that are not aware of environmental consequences of their behaviour. Besides, the solution of majority of environmental problems requires collaboration, grass-root approach, the appreciation of local knowledge, adaptive and flexible approach, networking, cross sectoral cooperation. These are all central features of social innovation, and less so in traditional top-down, command and control approach.

There is a number of initiatives dealing with various environmental issues – climate change adaptation, energy use, waste management and recycling, transport, pollution, preservation and sustainable use of biodiversity and ecosystem services, farming and food production, etc. – already recognized and analyzed within the conceptual framework of social innovation (SCUUWEB, 2014). FfL has also already been recognized as promising social innovation (Boss, 2011), although not yet explicitly analysed within the social innovation conceptual framework. More recently, social innovation hubs have been established to support social innovation dealing with some environmental issues. E.g. Keep Britain Tidy Centre for Social Innovation was recently established within the Social Innovation to Prevent Littering project funded by UK DEFRA (Keep Britain Tidy, 2014).

3.3. Key success factors for Social Innovation

Although the Social Innovation is still the subject of active research (EC, 2013), with no universally established conceptual framework, various comparative analysis (e.g. BEPA, 2010; SCUUWEB, 2014; Evers et al 2014) of both theoretical frameworks and case studies generally agree on the following major elements and dimensions of the successful social innovation.

Crises as an opportunity: Social innovation is commonly triggered by some crisis. In the area of environmental challenges this is some environmental crisis, combined with the growing appreciation of threatened ecological values and the understanding of inadequacy of the existing or currently proposed models and solutions. The crises triggering social innovation provide convincing arguments required for successful mobilization and the engagement of critical mass of stakeholders.

Innovative, action-enabling reframing: The key feature that differentiates social innovation from other participative initiatives is its innovative reframing of addressed problem that allows and suggests fresh insights and new approaches, more effective than those used in an old framework. By presenting a problem not as a gloomy destiny but as an opportunity to create a new, brighter reality, successful reframing is action-enabling. Reframing could be triggered or facilitated by education, cross sectoral exchanges, awareness raising or value changing experience – either direct or communicated through the media. It is not a straightforward process. The adoption of new ideas by critical mass of stakeholders requires effort and takes time. Social innovation commonly uses recent technical innovations (including social media and opportunities for citizen science). Finally, social innovation should keep being innovative and adaptive to the changing circumstance.

Stakeholder engagement, networking and empowerment: In the currently dominant top-down models of governance, stakeholder engagement is often treated as unavoidable nuisance. Contrary to that, in the social innovation approach, stakeholder engagement is the main source of ideas and energy for the process. To be effective, stakeholder engagement has

to be close, personal and maximally customized to interests and sensibilities of various stakeholder groups. The establishment of effective cooperation coalitions among the local stakeholders is crucial to enhance public recognition and long term ownership over achieved results. Wide networking, including stakeholders from “the other” (e.g. business, policy) sectors is critical for both initiative’s transformative potential and its resilience and sustainability. It also creates opportunity for community-based, action-oriented social learning. “Learning-by-together-doing” is much more effective than one-way-education activities.

Multi-functionality: Successful social innovation is intentionally designed to be multi-functional and appealing to the widest possible range of stakeholders with different interests. Typically, at the same time, it solves some environmental problems, provides an opportunity for the inclusion of some vulnerable social group, contributes to the wellbeing of community and strengthens the local economy.

Social entrepreneurs: Social innovation requires social entrepreneurs and social entrepreneurship, i.e. an individual or core group following entrepreneurial principles (risk-taking, imagination, perseverance, confidence) and providing steady and inspired leadership. Effective leaders have to care for and have sufficient knowledge about the issue, while also having capacity to serve as broker, conflict manager and an intermediary between various stakeholders. Social innovation can be initiated by actors from all sectors, including individuals, community groups, NGOs, academics, governments, businesses and all combinations of these. Similarly, it takes formal structure most suitable for concrete circumstances, more or less formal, from ad hoc gathering organized through social media, to associations, NGOs, cooperatives, social enterprises and companies.

Institutional support: Although social innovation comes from someone’s inspiration, institutional (political, financial, in-kind) support increases probability for the sustainability of positive changes induced by social innovations and allows them to become more than just an experiment. The support should be finely tuned to the features of the social innovation: i.e. not killing the initiative’s flexibility and innovativeness by too much rules and procedures; accepting occasional failures, as they are a natural part of the learning and innovating process.

Diffusion: The diffusion of social innovation is necessary for mainstreaming positive changes into the existing institutional set-ups and mind-sets. It is also the main mechanism by which social innovations spread from one environment to the other. The possibility of positive change demonstrated in one environment is the most effective trigger for reframing in some other environment which still follows old models.

Besides these main features, it is also well established that environment related social innovations are more probable in supportive environment characterized by: 1) nurturing of environmental awareness and appreciation for natural heritage; 2) building of capacity for social entrepreneurship within the community; 3) fostering of dialogue, networking, cooperation between key stakeholders; 4) accessible institutional support.

4. RECOMMENDATIONS

An analysis of the governance within the fisheries sector in Croatia suggests that social innovation is the only feasible approach enabling the modernization of fisheries sector while promoting the circular economy approach. Based on the customization of the established best

practice in social innovations for environment, following recommendations for the introduction of ALDFG management and FfL practices into the Croatian fisheries sector are formulated:

Crises as an opportunity: Although the situation with ML in Croatian fisheries sector itself is currently not perceived as a crisis of such urgency to give impetus to social innovation on its own, ML is sufficiently established as an urgent and significant global environmental threat to be effective as an argument and motivator for social mobilization and action. Two key messages suggested by FfL guidelines (OSPAR, 2007) are: "1) Marine litter is a problem that can be solved if everyone takes responsibility for their actions; 2) Marine litter damages fishermen's livelihood as well as the environment and it is in everyone's interest to solve the problem". Effective communication of the estimates of costs of negative ML impacts and the benefits of positive practices such as FfL, like those presented in this paper, should be used to convince a critical mass of stakeholders to join the initiative.

Innovative, action-enabling reframing: The main reframing should be, on one hand, the realization of the limited effectiveness of traditional top-down Command-and-Control governance system in fisheries sector and, and on the other hand, the realization of the real potential of currently underestimated social innovation approach. The main barrier to the latter is prejudice that such approach "does not work in our tradition", based on experience in which it has been followed declaratively, but deployed skills, know-how, experience, energy and time were not sufficient to achieve tangible results. What makes this prejudice relatively unchallenged is that it allows situation of "not-doing with nobody responsible", as easy excuses are available that "inspection is too weak due to budgetary constraints" and alternative approach "does not work in our tradition". The required reframing should be triggered by studying successful examples from elsewhere (OSPAR, 2007) (KIMO, 2012) and realization that all obstacles existing here, existed there too, that their success did not come just from the "great idea" but through determined leadership, persistent, objective-driven effort, the adaptive and flexible application of well-established methods and tools. Pilot activities implemented within the Defishgear project (Defishgear, 2015) also demonstrated that such approach is feasibility in our tradition.

Stakeholder engagement, networking and empowerment: Initiative should engage a wide spectrum of stakeholders, including, primarily fishermen through their cooperatives, associations, fishing ports of their affiliation, but also green NGOs dealing with the waste issue, firms from the recycling sector, diving centres that are the main partners in ALDFG removal activities, port authorities, ministries and other relevant authorities that can provide support to the initiative. Stakeholder engagement is critical, as this is the process through which the majority of desired behaviour change (e.g. adopting FfL practice, selective collection of old fishing nets, adopting practices that decrease the probability of losing fishing gear) is to be accomplished. To maximize the probability of successful behaviour change, well established methods should be used, such as e.g. EAST framework (TBIT, 2014) which, based on several years of testing of behavioural science principles in practice, did conclude that simplest advice for effective tactics for behaviour change is that it should "make it Easy, make it Attractive, make it Social, and make it Timely". Benefits should be convincingly communicated through simple messages, in customized way for each stakeholder group. Engagement should be made attractive by devising various awards, such as simple gifts for participants, good will and publicity, positive marketing, or technical assistance in e.g. application for EU funds. Defishgear project pilot activities have shown that even simple fisherman raincoat with initiative's logo is much appreciated by fishermen as a symbol of

others' appreciation for their effort. Even more costly awards can be considered, as FfL activities, by removing ML from marine environment, create real economic value to society.

Multi-functionality: Multi-functionality is already suggested by the above wide list of stakeholders, as well as in already explained multiple benefits: to environment, to the recycling sector, to the fisheries sector, to social cohesion within the sector and within the fishermen communities, to the environmental awareness of the general public.

Social entrepreneurs: Stakeholder analysis done within the Defishgear project (Defishgear, 2015) suggested the combination of stakeholders as the core group behind the initiative. It would preferably include: 1) the leading environmental NGO in coastal part of Croatia, with required social entrepreneur capacities and experiences, proven undying enthusiasm and extensive experience in dealing with waste issues, but also with experience in projects promoting sustainable fisheries and already established contacts and the relationship of trust with many actors within the fisheries sector; 2) the representatives of the most active fishermen co-operatives. Such core group would combine all skills, know-how, experience and enthusiasm required for the task. The establishment of the scheme requires full time manager.

Institutional support: Experience suggests (OSPAR, 2007) that institutional support from the national level is more effective than from the local level, although the latter is also welcomed. Institutional support is arguably guaranteed as both relevant ministries – fisheries and environmental protection – are already actively working on programs foreseeing the introduction of ALDFG management and FfL, while financing is available both from the European Maritime and Fisheries fund and the Croatian Environmental Protection and Energy Efficiency Fund. The process should be initiated by the establishment of the infrastructure for ALDFG management and FfL in 10-20 major fishing ports, involving 150-200 boats in FfL scheme, selectively collecting and forwarding for recycling 50% of assessed annual amount of end-of-the-life-cycle nets, removing ADLFG from 15-20 selected hot-spots. The Ministry of Environmental and Nature Protection should secure seamless connection between systems being established and the existing waste management systems.

Diffusion: Arguably the most important diffusion process will be analysis, presentation and communication of relevant successful examples from elsewhere, as part of the reframing facilitation. In the mainstreaming phases of the process, there will be diffusion of positive examples of local pioneers from the pilot phases. Successful change in the fisheries sector could also have a number of positive spill-over effects including in addressing of: ML issue in other sectors (primarily tourism), other environment-related issues within the fisheries sector, and other issues in the waste management sector.

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THE VIEW OF DAIRY SECTOR AND THE ECONOMIC SITUATION OF MILK PRODUCERS IN POLAND AND IN LITHUANIA AFTER ACCESSION TO THE EU

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ABSTRACT

The dairy sector is the main branch of agricultural production which constitutes source of income of many farms in Poland and in Lithuania. Accession of both countries to the structures of the European Union has radically changed the functioning of the entire dairy sector which faced changes and the necessity to comply with the new free market circumstances. The first aim of this article is to present the overview of the dairy industry in Poland and in Lithuania after the accession to the EU. The second aim is to focus on the economic situation of milk producers. The summary clearly shows the immense progress in complying with the EU requirements, although the gap between these two markets and the biggest EU milk producers is still significant. The economic results of analysed dairy farms in Poland and in Lithuania confirmed the improved performance of productivity since 2004. Relatively small (about 50%) share of subsidies in farm net income makes milk production less dependent on such type of support.

1. INTRODUCTION

The Central and Eastern Europe varies in respect of policy and agriculture but in this geographical area the countries share mutual historical heritage. After the II World War, these countries found themselves under strong influence of the Soviet Union which caused significant social and agricultural uniformity among them. After the collapse of the Soviet Union, the Central and Eastern European countries gained complete independence and entered the path of democratic policy and free market economy development. Despite the similarities between economies of individual countries, their starting positions varied greatly, at the beginning of the transformation period. The Central and Eastern European countries and the Baltic States seemed to be quicker than other countries to adjust to the market economy rules towards international trade. The pace of economic changes and progress of democratisation in these countries were faster than in the so called Eastern-block countries (Sorsa, 1997). A chance also occurred for economic cooperation, especially between the Baltic States and the Central European countries.

The dairy sector is one of the main branch of agricultural production which constitutes source of income of many farms in Poland and in Lithuania. The transformations of the political and economy system caused radical change of dairy market conditions. This also included the end centrally-planned economy of the dairy sector with significantly subsidised milk processing sector, which was characterised by excessive supply of the raw material. Dairy cooperatives stopped being subsidised by the state and faced the necessity of privatisation. Many countries which participated in the transformation and later on the steps to accession to the European Union structures, had to deal with numerous problems within the food economy in order to function in the reality of free market. To cope with market competition, consolidation measures were introduced, especially pertaining to small and medium-sized enterprises (SME). Also, an increase of the concentration of processing took place.

The old local and regional market networks were broken in the Central and Eastern European countries and were substituted by wider international cooperation. The strong relationship of the Baltic States, within the Baltic Free Trade Area (BFTA) was loosened and ceased to exist in May 2004 due to the accession of Lithuania, Latvia and Estonia to the EU. This allowed for easier international contacts and trade with other countries. A chance also appeared for Polish and Lithuanian producers and processors of dairy to widen the international cooperation. The reports, from recent years, stating that international trade activity in the scope of dairy products, and even raw milk trade, between Poland and Lithuania is starting (PAP, 2012). The integration of Poland and Lithuania with the EU visibly changed the country's dairy sector, which leads to observation of the sector's development under new market conditions, the conditions of international trade, and farms' competitiveness conditions. Poland and Lithuania are the biggest milk producer within the Central and Eastern Europe region and it is very interesting to study the path of the dairy sector development of those two closely related countries.

The aim of this study is to present the overview of the dairy industry in Poland and in Lithuania after the accession to the EU. The paper uses domestic statistical data and FADN EU data available between 2004 and 2012 which were subject to tabular and graphic analyses. The second aim is to focus on the economic situation of specialised dairy farms in Poland and Lithuania. In that case the FADN EU data were taken into account. Summary attempts to describe synthetically the current state of the dairy sector as well as the economic condition of milk producers in Poland and in Lithuania.

2. DAIRY SECTOR IN POLAND AND LITHUANIA – THE OVERVIEW

The dairy sector in the modern understanding is a complex including three, tightly related parts which constitute elements of the milk marketing chain (Sznajder, 1999):

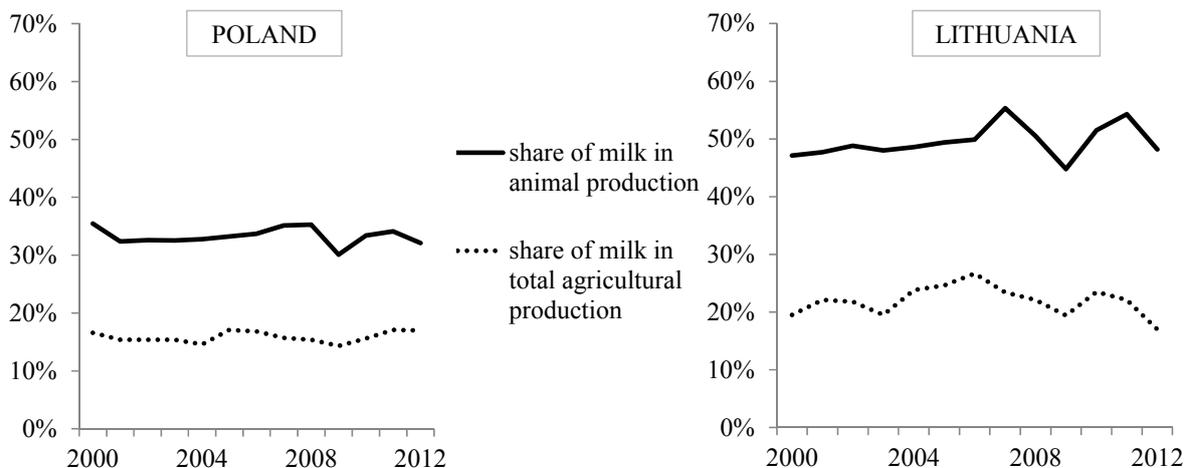
- **the production of milk** on agricultural farms, using knowledge and farmer's work, capital and the entire infrastructure of the farm, including: the breeding and husbandry of dairy cows, the plant production for feed (required forage area), the purchasing of means of production and the selling milk,
- **the processing of milk**, most often located outside an agricultural farm, usually at the dairies but also at cheese dairies and milk powdering plants. The processing plant is a complicated structure including: organisation of the company, its technical infrastructure, milk processing technology and waste disposal technology. The procurement of milk is the element joining processing and the production, and the sale of final dairy products is the element joining processing and trade,
- **the distribution and the trade** which aims at supplying the final client with final dairy products of proper quality, in a way and place to the client's highest satisfaction.

Each stage of the milk marketing chain was the subject to transformation. The direction of the changes is largely influenced by the Common Agricultural Policy (CAP) and Poland and Lithuania participate in shaping it. Changes are also observed within the structure of the chain, for example: greater cooperation between producers and consolidation of processing but also internationalisation of the dairy sector. Without a doubt, changes occur also within the production at dairy farms, especially when it comes to aspects related to the quality of the raw product which, in turn, is connected with consumer expectations. All changes taking place in the dairy sector are visible more strongly in those countries which underwent the transformation of the political system. Especially with the switch of the entire agri-food sector from the centrally planned economy to the market economy system (Malak-Rawlikowska, 2007). The entire milk marketing chain operates within the current free market conditions, both in Poland and in Lithuania, however, changes within individual parts of the chain are characterised by varying dynamics.

2.1. Production of milk in Poland and Lithuania

The animal husbandry, both in Poland and Lithuania, is an important agricultural sector and the dairy cows husbandry and milk production are one of the most important branches of agricultural production. During the first three years after the EU accession (2004-2006) the value of milk production within the value of total agricultural production amounted to: in Poland 15.4%, 14.6% and 17.1%, and in Lithuania 23.8%, 24.6 % and 26,7%, respectively. In later years a small decrease of the share was recorded (Fig.1). The direction of the changes also shows that the significance of milk production increases. During 2004-2012 period, taking into account extreme values, the share of the milk production value within the total animal production amounted to 32.8-32.1% in Poland, and 48.6-48.2% in Lithuania. However, during the pre-accession period (2000-2003) it amounted to, respectively: 35.4-32.6% in Poland and 47.1-48.0% in Lithuania. It should also be noted that the share of milk within the structure of Lithuania's total animal production value was relatively high, and even higher than results of countries including Germany and Holland. In Poland the value equalled the average EU-27 value, similarly to France and Great Britain (Eurostat, 2012).

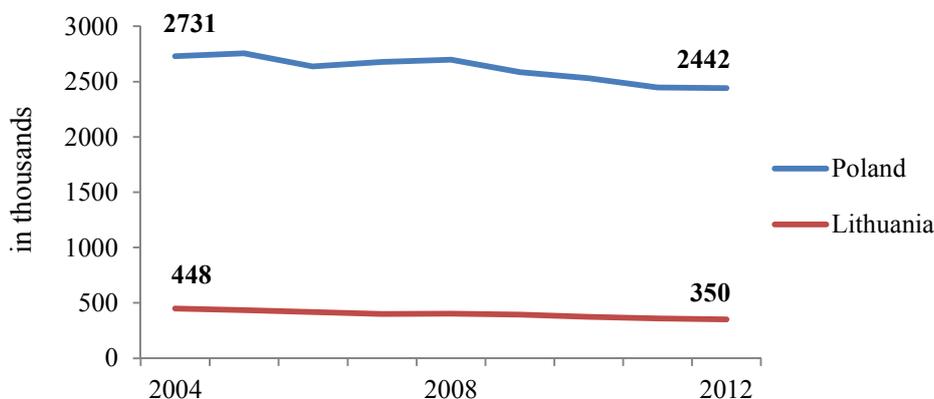
Figure 1. The share of milk production value in total agricultural production and animal production in 2004-2012 in Poland and Lithuania.



Source: Central Statistical Office of Poland and Lithuania, var. years.

The accession to the EU with the introduction of CAP was the main factor stimulating the process of restructuring the dairy sector in the last years. Important elements in this process were, e.g.: improvement of milk quality; pre-accession support investments, export development, increase in milk prices and the milk quota system. Also the increasing competition on a food market (market entry of foreign dairies, especially in Poland) has radically changed production conditions. The restrictive milk quality standards (chemical composition and purity as well as levels of different micro-organisms) mainly caused elimination of small producers from the market, who were unable to meet the quality requirements. The investments on improvement of milk quality required appropriate herd size and milk production scale to achieve the sufficient milk quota. It's worth noting, that milk quota system (limiting the milk production) was considered by producers as a barrier in the use of full production potential of dairy farms. Thus significant reduction in the number of dairy cows can be noted both in Poland and in Lithuania (Fig.2).

Figure 2. Numbers of dairy cows in 2004-2012 in Poland and Lithuania.

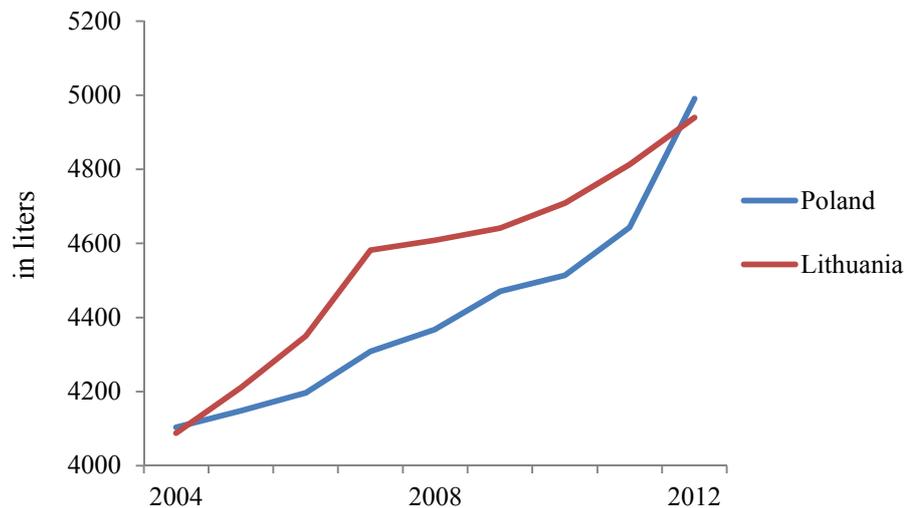


Source: Central Statistical Office of Poland and Lithuania, var. years.

The reduction of number of cows and decrease in population of dairy cows was compensated by the systematic increase of cows' milk yield (Fig.3). During 2004-2012 period milk yield in

Poland increased by 21.6%, and in Lithuania by 20.8%. Despite the decrease in population of cows, the amount of milk produced increased by 18.4% in Poland and in Lithuania – by 19.3% (the higher milk yield being the decisive factor). The increase of milk production was connected with improvement of production technology. The changes in production techniques used in dairy farms were observed, as a result of investments on new technologies (e.g. refrigerator for milk, milking parlors) and changes in nutritional practices (e.g. using the silage rather than hay).

Figure 3. The milk yield in 2004-2012 in Poland and Lithuania.



Source: Central Statistical Office of Poland and Lithuania, var. years.

Increase of milk yield directly influences the strengthening of this direction of agricultural production on the national scale. However, the fragmented production of milk is one of the greatest problems of the dairy sector in both countries. The greatest share within the structure of dairy farms, in both countries, was of the small farms (up to 10 cows). In 2010, in Poland the share amounted to 82.6% of dairy farms (in 2002 to 93.5%), and in Lithuania it amounted to 94.5% in 2009 (in 2004 to 97.7%) In 2010, in Poland 5.9 animals were kept per dairy farm (in 2002 r. – 3.3 animal) and in Lithuania – 3.6 animal in 2009 (2.6 animal in 2002). A slightly better situation can be observed in the typical dairy farms aiming at commercial farming. Studies provided by the European Commission show that between 2004 and 2009 in farms included in the FADN study, specialising in milk production, the average number of cows per 1 farm in Poland amounted to 14-16 animals, and in Lithuania – 12-18 animals; and the average milk yield amounted to, respectively, 4968-5340 kg/cow in Poland and 5046-5344 kg/cow in Lithuania.

It is worth noting that milk production is tightly connected with feed plants production, which is largely influenced by natural conditions of plant production. The use of existing grazing lands for the purposes of roughage production and grazing is important in milk production. The grazing system is the most popular system of sustaining dairy cows, both in Poland and in Lithuania. During the studied period (2004-2012) the share of grazing lands area in Poland is relatively stable in relation to the total of agricultural area and amounted to 19.7% to 21.3%. In Lithuania, in 2004, the share of grazing lands area was relatively high (amounting to 36.7% of agricultural area), however, in the following years the share decreased and amounted to only 19.4% in 2012. According to the studies by the European Commission, in farms specialising in milk production (included in the FADN studies), the use of feed area (area for production of feed in a farm) is very different between Poland and Lithuania. During

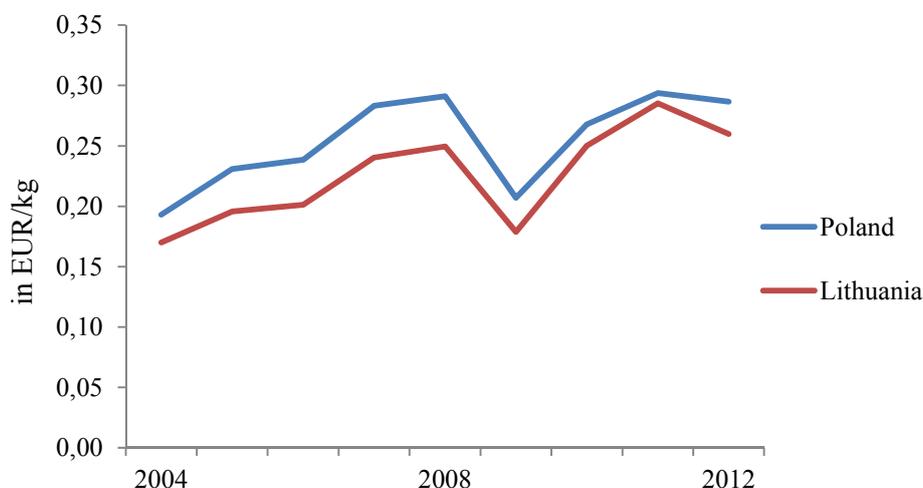
the 2004-2009 period, in Poland the feed area in those farms was on a stable level with 0.8-0.9 ha grazing area per 1 cow (except for 2004 – 0.6 ha/cow). In Lithuania, however, the feed area per 1 dairy cow was significantly larger, and during the said period showed decreasing trend, from 2.4 ha in 2004 to 1.7 ha in 2011.

The monitoring is an important mark of progress in technology of milk production and production of milk, as well as the results of assessment of dairy cows milk yield. It is often thought that with the help of assessment of milk yield modern and professional herd management is possible, including within the scope of: assessment of genetic advantages of animals allowing efficient husbandry and appropriate selection, that is heard improvement through improvement of animal characters and habit (Polish Federation of Cattle Breeders and Dairy Farmers, 2014). The milk yield program facilitates optimal feeding of animals, influences the increase of amount and quality of produced milk, thus increasing its profitability, and allows determination of the costs of production of milk and herd's economic assessment. In Poland, as in Lithuania, the number of dairy cows included in milk yield assessment increases. In 2004 the percentage of cows under control in Poland amounted to 17.4%, and in Lithuania as much as 42.2%. Following years saw a significant increase of interest in the assessment, and in 2012 the percentage of cows under control in Poland amounted to 27.9%. However, in Lithuania during the period remained at a relatively stable level and amounted to 43% in 2012 (during the 2005-2008 period amounted to as much as 47-49%). It should be noted that production results (milk yield) of cows under assessment are much higher than the national average in both countries in question.

The most popular husbandry races within the milk yield assessment include:
in Poland - Jersey, Montbeliarde, Polish Holstein-Friesian, Polish Red-White, Red Polish;
in Lithuania - Lithuanian Native Ash-grey, Lithuanian B & W, Holstein B&W , Native White-back, Ayrshire.

Raw material selling price obtained is a very important aspect of milk production. During the period 2004-2011 milk producers obtained favourable milk sales prices, despite some years of downturn (Fig.4).

Figure 4. The selling milk prices in 2004-2012 in Poland and Lithuania.



Source: Central Statistical Office of Poland and Lithuania, var. years.

Just after Poland and Lithuania's accession to the EU, in 2004, purchase prices were relatively lower which resulted from the decreasing tendency of shaping of purchase prices during the pre-accession period, that is years 2000-2003. In 2009 a significant decrease in milk purchase prices occurred, resulting from the global economic crisis, the results of which were felt by both Polish and Lithuanian producers.

It should be highlighted that milk production, as well as purchase of milk by the dairy industry are subject to seasonal fluctuations. The seasonal character of milk production is shaped by numerous factors, mainly within agriculture, and to a lesser degree within the external surroundings of farms (Matysik-Pejas, 2007). The inequality of production of milk is a phenomenon typical of smaller dairy farms where milk is not the main commercial product. This factor is of no significance to farms with large herds of dairy cows, specialising in production of milk of high quality.

2.2. Milk processing in Poland and in Lithuania

The process of technological and structural adjustment (after the accession to the UE) of milk processing was less impetuous than in case of the changes at the level of producers. Adjustment of milk processing to the EU market requirements was connected mainly with high quality requirements set for the production process but also with high quality requirements for the raw milk. The EU aid schemes, mainly investment grants for modernisation and further development of processing facilities were and still are an important support allowing transformation. A lot of the smaller facilities, which did not meet the requirements, was closed down or bought by large companies. In Poland a significant part (around 20%) of big and medium companies has foreign strategic investors, which not only guarantees external capital injection, technology and management systems know-how but also facilitates access to selling markets and distribution channels, and accelerates promotion of the required standards and procedures. Nevertheless, similar strategic actions may be observed in case of companies with a domestic capital.

After the accession to the EU, considering the number of subjects processing milk, in case of Poland a sudden increase in the number of processing facilities fully adjusted to the EU requirements was noted. There were 55 such facilities in 2004, and only a year later, the number increased to 225. In the following period (2006-2012), the number of processing facilities decreased from 226 to 172, mainly due to concentration and joining of companies into larger structures but also a significant percentage of subjects had to close down. In Lithuania, in 2003 there were 20 processing facilities in the dairy sector, and in the 2006-2012 period, the number dropped and currently there are 13-14 processing facilities. It can be stated that milk processing in Lithuania is very concentrated (in 2012 four main groups of producers in the country combined 80% of income of the total dairy sector).

2.3. Distribution of dairy products in Poland and in Lithuania - export and import

Poland and Lithuania are significant net exporters of dairy products (Bugala 2011). Cheeses, curds, powdered and liquid milk, and cream are the basic export products. Both countries' accession to the European Union influenced the systematic increase of export. The exception being 2009 characterised by lower results of both Polish and Lithuanian foreign trade due to the economic crisis (a small decrease was noticeable in Lithuania as soon as 2008). In 2009 the value of Polish dairy products export dropped by about 24% in relation to the record year 2008, and the drop in Lithuania was significantly smaller and amounted to about 14%. The share of dairy import in the total value of food products imported to Poland, as well as to

Lithuania is insubstantial and in 2009 amounted to around 3% and 4%, respectively. The value of import of dairy products has been rising continuously since 2003, with the exception of 2009, as in the case of export.

Table 1. Polish foreign trade in dairy products (mln EUR).

Specification	2003	2004	2005	2006	2007	2008	2009	2010
export	327	561	880	916	1165	1222	925	1177
import	50	62	99	140	259	284	273	364
saldo	276	499	782	776	906	938	652	813

Source: Central Statistical Office of Poland and Lithuania, var. years.

The European Union is the main recipient of Polish and Lithuanian dairy. In 2003 the dairy products imported to the European Union from both these countries amounted to 41% of total value of dairy export. Since Poland's accession to the EU, the percentage has been rising and amounted to 69% in 2004 and 82% in 2009. In case of Lithuania, export to the member states remains at a fairly stable level of 60-65%.

Table 2. Lithuanian foreign trade in dairy products (mln EUR).

Specification	2003	2004	2005	2006	2007	2008	2009	2010
export	152	220	246	285	385	372	320	405
import	11	13	35	59	82	112	73	123
saldo	142	207	211	226	303	260	247	282

Source: Central Statistical Office of Poland and Lithuania, var. years.

In 2010 Poland noted a slight increase in significance of export to countries outside the EU. The increase amounting to almost 23% resulted from the increase of export of dairy products to Russia and Arabic countries. Germany is the most important recipient of Polish dairy products. In 2004 the value of export amounted to only 8%, and currently it amounts to ¼ of the total value of Polish dairy export. However, export of dairy products from Lithuania to countries outside the EU amounts to 35-40%, of which most products reach the Russian market (33% of total export of dairy products in 2010).

The direction of import of dairy products to Poland and to Lithuania is similar to that of export – from member states. In 2003 import share amounted to 82% and 77% of total value of imported dairy products, respectively. In 2010 the share increased to 99.6% within the structure of Polish dairy import, and 100% within Lithuanian. Germany is Poland's main trade partner, and it is from this country that nearly half of all the imported dairy products comes. France and Lithuania are two partners of lesser importance. Potentates from the region of Oceania (New Zealand, Australia), as well as Switzerland are the suppliers from outside the EU. In case of Lithuania, Latvia and Estonia are the main suppliers of dairy products and, what is worth highlighting, so is Poland (as much as 23% of total dairy products import).

2.4. Distribution of dairy products in Poland and in Lithuania – the consumption

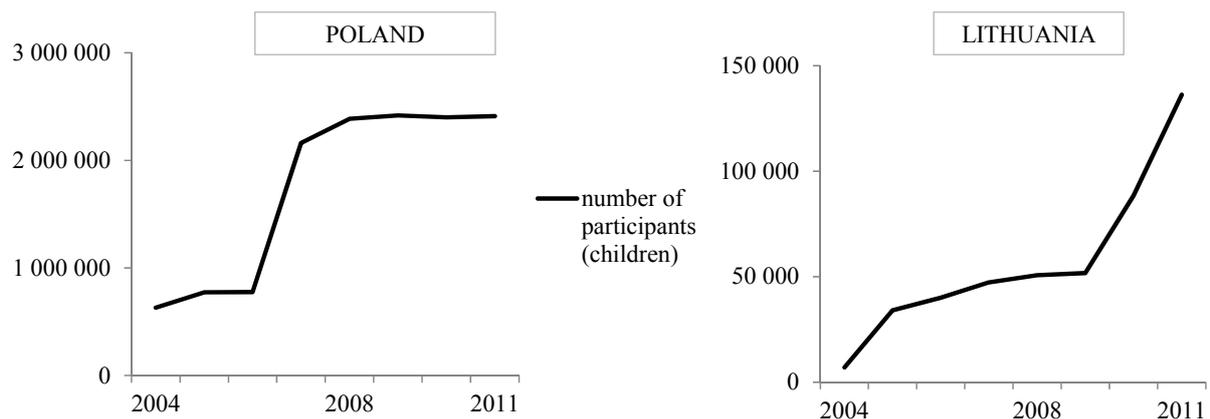
In the 2003-2005 period, in Poland, a decrease in milk and dairy products consumption in general, as well as per capita could be observed. In 2005 total milk and dairy products consumption dropped in comparison with 2003 by 8.5%, and milk and dairy products in milk equivalent consumption (no butter) per capita dropped by 4.4%, and butter consumption per capita decreased by 10.6% (Pietrzak, Szajner 2006). A gradual increase in dairy consumption

can be noted since 2006. In 2009 milk consumption in Poland reached the level of 170-182 litres per citizen, and consumption of butter amounted to around 4.2 kg. Consumption of cheeses increased by nearly 5% in comparison with 2008. According to IAFE-NRI estimates, in 2011 the balance consumption of milk in Poland calculated per citizen amounted to 193 litres (excluding milk used for the production of butter). This means that it was higher by 1% than the previous year and by about 12% than in 2005. Consumption of butter and cheeses in 2011 amounted to 4.0 kg per capita. Newest data show that dairy products consumption (in milk equivalent) amounted to the average of 280 kg in 2012, calculated per number of Polish citizens.

A systematic increase in general consumption of cheeses and butter may be observed in Lithuania since 2006, however, consumption of milk decreased (Eastagri, 2009). According to FAO data, in 2009, in comparison with 2006, consumption of butter and cheeses increased respectively by 34 and 85%, and consumption of milk decreased in total by around 72%. However, when analysing the consumption of milk and dairy products per citizen, calculated per kg of milk until 2009, it remained at a relatively stable level of 280-290 kg. The consumption per citizen of Lithuania in 2009 in case of milk was at 137 litres, and of butter at 3.49 kg. Consumption of cheeses dropped by nearly 10.5% in comparison with 2008 (Eurostat 2010).

Since 2004, in Poland and in Lithuania the "EU School Milk Programme" social campaign has been run. The aim of the programme is to teach children and youth good eating habits, through promotion of consumption of milk and dairy products. This form of support and promotion of consumption of milk and dairy products met with noticeable interest in both countries. Poland is a leader in implementation of the programme as far as consumption of milk and obtaining of support thanks to EU funds are concerned. The number of children (at educational establishments) consuming milk and dairy products within the programme, in Poland and in Lithuania, are shown in Figure 7.

Figure 7. EU School Milk Programme in 2004-2012 in Poland and Lithuania.



Source: EU School Milk Programme.

The scale of the "EU School Milk Programme" in Poland and in Lithuania is incomparable. Realisation of the programme in these two countries also differs greatly. It is worth noticing that the significant increase in the number of children included in the programme in Poland occurred slightly earlier (in 2006), and stabilised in later years. In Lithuania, the increased interest began in 2009 and the number of children included in the programme in following years increased further, rapidly.

3. THE ECONOMIC RESULTS OF MILK PRODUCTION IN POLAND AND LITHUANIA

Farms specializing in milk production are an important part of the Polish and Lithuanian agriculture, thus, it is justified to study their productivity and effectiveness. One way to assess the operation of farms is the management effectiveness, that is, the ratio of the effects to the means used (Józwiak, 1998). In order to evaluate the effectiveness of dairy farms, the assessment of farm productivity can be used. Productivity is a quantitative relation between the output and the size of the factor involved in its production (Kołoszyc, Świtłyk, 2004). Effectiveness can be measured using indicators, the most frequently economic and financial ones of a cost and resource nature, in which the aim should be full use of the potential (Kulawik, 2010). In this study, measuring the effectiveness will be based on total output profitability (Kulawik, 2008).

3.1. Materials and methods

The study uses available empirical data collected in the EU FADN from 2004 (the year of the accession to the EU) and 2012 (recently available data on EU FADN database). Study objects were chosen using the purposive sampling method. Groups selected for the analysis were farms specializing in dairy (type of farming – TF14 Specialist milk). The type of farming is defined on the basis of the contribution of individual types of agricultural activities to the total Standard Output value of a farm, and it reflects the pursued system of production. The selected farms specializing in milk production were characterized by the fact that revenues from the sale of milk and dairy products accounted for over 50% of total revenues. For the purposes of this analysis, total revenues are considered to be total output¹ increased by the value of subsidies related to operating activities.

The indicators were used to assess the productivity of farms, as follows:

- Total output per dairy cow,
- Total output per 1 AWU (Annual Work Unit)²,
- Total output per 100 Euro assets.

The following indicators were used to analyse the economic efficiency:

- Total output profitability [%] = (Total Output + Total Subsidies excl. on investments) / Total Input,
- Total costs/total output.

To illustrate the economic situation of Polish and Lithuanian dairy farms, economic results of farms with the type of farming TF14 specialist milk are also presented in selected EU countries: Hungary (Central Europe) and Latvia (Baltic State).

3.2. Results of the study

It has to be accentuated that the economic results of surveyed group of farms only reflect the results of the selected sample, but there are indications that it may be an illustration of the

¹ Total output of crops and crop products, livestock and livestock products and of other output, sales and use of (crop and livestock) products and livestock, change in stocks of products (crop and livestock), change in valuation of livestock, various non-exceptional products, less purchases of livestock.

² Total labour input of holding expressed in annual work units = full-time person equivalents.

economic performance of milk production in general. The main informations concerning the designated groups of farms in selected countries were presented in table 4.

Table 4. Selected data on the group of farms (TF14 Specialist milk) in the selected countries.

Specification		Poland		Lithuania		Hungary		Latvia	
		2004	2012	2004	2012	2004	2012	2004	2012
Economic size	1000 Euro SO	19.6	29.3	11	18.9	73.6	93.2	18.1	25.1
Labour input	AWU	1.77	1.82	1.49	1.67	2.79	2.87	2.3	1.98
Total Utilised Agricultural Area	ha	15.54	21.04	24.96	32.82	62.1	72.52	52.16	47.27
share of forage crops	%	50	60	69	72	58	60	75	81
Dairy cows	LU ¹	12.2	14.8	8.3	11.1	30.3	33.5	14.1	14.4
Stocking density	LU/ha	2.2	1.8	0.6	0.7	1.2	1.2	0.6	0.6
Milk yield	kg/cow	4688	5304	4476	5340	5968	6722	4627	5651
Total output	Euro	17806	33551	12099	27804	87655	131117	23689	36308
share of milk&milk product	%	64	80	51	66	52	62	52	69

¹ Livestock Unit.

Source: Own calculation based on EU FADN data.

At the beginning, it is worth emphasising that the selected Polish and Lithuanian farms were, in terms of area, several times smaller than the Hungarian and Latvian ones (it is the result of a greater concentration of milk production in Hungary and Latvia). Typically, the structure of crops on dairy farms is dominated by fodder plants, providing cheaper feed from own production. The share of fodder plants in the analysed set of farms was the highest in the studied farms from Lithuania (69-72%) and Latvia (75-81%), whereas it was significantly lower in case of Polish and Hungarian farms (about 60%). Feeding system is an important issue affecting the production and economic results in farms focused on dairy cows.

The degree of specialization has been increasing along with the increase in the scale of keeping dairy cows, both the number of cows and their milk yield. Since 2004, the production situation of selected farms has improved in all the countries concerned. In terms of the average milk yield of cows, in 2012, Hungarian farms reached results by 27% better (about 6700 kg per cow) than Polish and Lithuanian farms (about 5300 kg per cow) and by about 19% better than selected Latvian farms (about 5650 kg per cow). Selected group of Hungarian farms (these were the largest farms amongst others) were also characterized by the best labour productivity. In 2012, the number of people employed full-time per 10 milk cows was 0.86 AWU. In case of Poland, it was 1.22 AWU, Lithuania – 1.50 AWU and Latvia – 1.40 AWU.

The first of the measures used was the value of production (total output) per 1 milk cow. The values of this rate corresponded with the milk yield of cows in the analysed groups of farms increasing progressively in all countries since 2004. Selected group of Lithuanian and Latvian farms reached the value of production of approximately 2500 euro/LU, and Polish farms – about 2300 euro/LU. The results obtained were lower than in the group of Hungarian farms by 36% and 41%, respectively.

Table 5. Selected factors of productivity on the group of farms (TF14 Specialist milk) in the selected countries.

Specification		Poland		Lithuania		Hungary		Latvia	
		2004	2012	2004	2012	2004	2012	2004	2012
Total output per dairy cow	Euro/LU	1460	2273	1459	2503	2891	3920	1686	2521
Total output per 1 AWU	Euro/AWU	10060	18435	8120	16649	31418	45685	10300	18337
Total output per 100 Euro of assets	Euro/100 Euro	25	17	30	31	28	45	50	44

Source: Own calculation based on EU FADN data.

Labour productivity informs about the value of production achieved per 1 full-time employed person. High labour productivity means that at a given workload the production unit achieved a higher value of production. Data presented in Table 5 shows that the labour productivity was higher in the groups with a larger number of cows in the herd. In Polish farms, with a herd of about 15 milk cows, production/AWU was nearly 18.5 thousand euro. There was a similar situation in relation to the studied farms in Latvia (18.4 thousand euro), and slightly worse in case of a group of Lithuanian farms (about 16.6 thousand euro). In the Hungarian farms, the value of production per 1 AWU was higher by more than half compared to the other groups and amounted to almost 46 thousand euro.

Hungarian and Latvian farms made the best use of capital. It is illustrated by the capital productivity index, that is, the value of production per 100 euro of assets involved. In 2012, in case of these groups of farms, this index amounted to 44-45 euro and was by 13 euro higher than on Lithuanian farms and by 27 euro than in the group of Polish farms. Farms in Poland were characterized by the weakest use of capital in the considered years (2004 and 2012).

Output profitability index in the selected group of Polish dairy farms was at the highest level (154%) compared to the other groups. It is worth indicating that in 2012, in case of Polish and Lithuanian farms, total costs were significantly lower than the value of output (costs accounted for 77% of the value of output), and in case of Lithuanian farms only slightly lower (accounted for 90%), and in Hungarian and Latvian farms costs even exceeded revenues (Table 6).

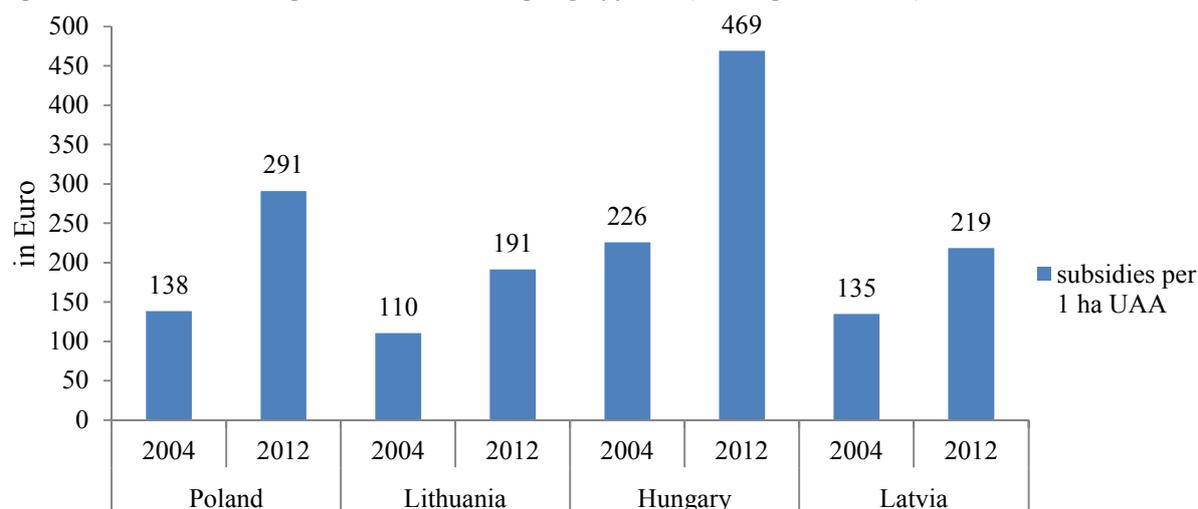
Table 6. Selected indexes of effectiveness on the group of farms (TF14 Specialist milk) in the selected countries.

Specification		Poland		Lithuania		Hungary		Latvia	
		2004	2012	2004	2012	2004	2012	2004	2012
Output profitability	%	160	154	166	137	108	119	137	122
Total costs/total output	-	0.70	0.77	0.74	0.90	1.07	1.06	0.94	1.05

Source: Own calculation based on EU FADN data.

The level of support with subsidies to 1 ha of UAA increased significantly from 2004 to 2012 in all the considered farms, but apparently larger support concerns rather the studied dairy farms in Poland and in Hungary than in case of dairy farms in Lithuania and in Latvia.

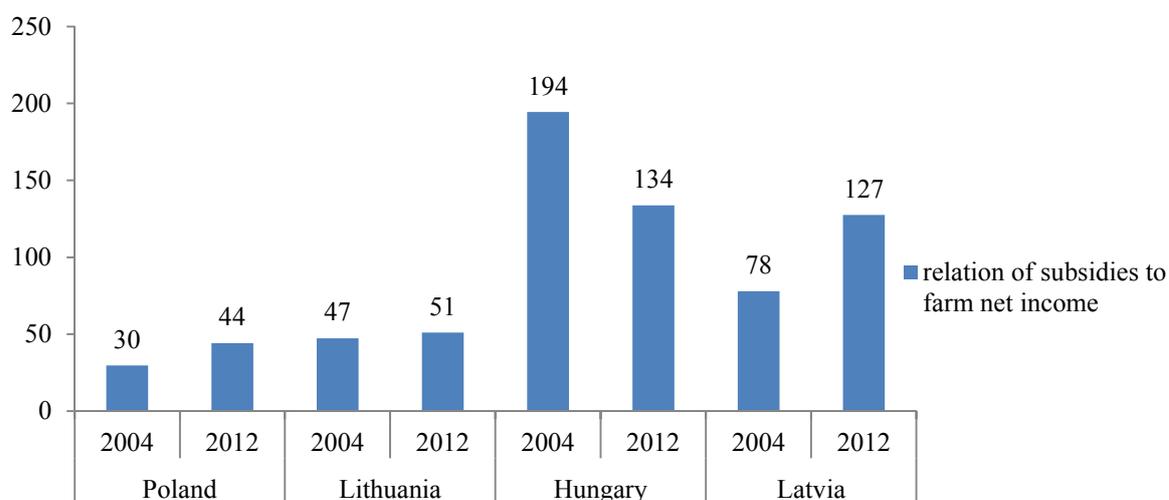
Figure 8. The subsidies per 1 ha UAA on the group of farms (TF14 Specialist milk) in the selected countries.



Source: Own calculation based on EU FADN data.

However, it is worth noting that the relation of subsidies to income from the family farm in Poland and Lithuania is relatively small (less than 50%). In case of Hungarian and Latvian farms, the level of this support amounted to as much as 130% in 2012.

Figure 9. The relation of subsidies to farm net income level on the group of farms (TF14 Specialist milk) in the selected countries.



Source: Own calculation based on EU FADN data.

4. SUMMARY AND CONCLUSIONS

The progress made in recent years (after accession to the EU) in Polish and Lithuanian dairy sector is a highly beneficial phenomenon, however the gap separating the two countries from the biggest EU producer is still wide, for example in the scope of production scale or cows' milk yield. The milk quota system, as one of the most important instruments of intervention on the milk market, had a strong influence on the structural and technological changes in milk production. It caused the elimination of small producers who could not meet the quality

requirements of production from the market which, in consequence, resulted in greater concentration of milk production. Also, as a result, the number of dairy cows was reduced, both in Poland and in Lithuania. The high fragmentation of milk production remains the greatest problem and challenge. The greatest share within the structure of dairy cow farms, both in Poland and in Lithuania, belonged to farms with small herds up to 10 animals. After the accession to the EU, a significant improvement of the situation could be observed, as the result of continuous concentration of production, however, the dynamics of the process is still weak.

A very important information comes from the comparison of the economic performance in selected dairy farms in Poland and in Lithuania with similar specialist dairy farms in Hungary and Latvia. Amongst the surveyed groups the milk production is more concentrated in Hungary and Latvia and the dairy farms appeared to be more specialised (in the matter of farm area and scale of milk production). However, the results of analysed dairy farms in Poland and in Lithuania confirmed the improved performance of productivity since 2004. In the other hand, the level of financial support of surveyed dairy farms was significantly higher in Hungary and Latvia than in Poland and Lithuania. But the selected indexes of the production effectiveness showed the better situation of selected dairy farms in Poland and Lithuania. Amongst the surveyed countries, in case of Poland the highest level of total output profitability index was calculated. The relation of subsidies to farm net income in case of Poland and Lithuania was relatively small (about 50%) which makes milk production less dependent on such type of support. While in case of surveyed dairy farms in Hungary and Latvia the large dependence on the subsidies is shown, in 2012 the relation of subsidies to farm net income was about 130%.

The processors' situation is influenced mainly by the conditions on sales markets of products. Processing facilities realise production strategies for the sale market. In Poland significant part of products is exported to the EU market (mainly Germany); in case of Lithuania, the Russian market is of importance. The long-term restrictions or constraints on import of Lithuanian dairy products observed have negative effect on the processors, who are thus forced to change the structure of production – instead of producing fresh products, products with longer expiry dates are produced, which allows comfortable search for other sales markets. Such products will be sold on Western EU markets, however the profitability of sales on those markets will be lower than in case of the Russian market.

Foreign trade in Polish dairy industry has been playing a major role for a long time, despite numerous difficult periods throughout history. The accession of Poland and Lithuania to the European Union and accepting of the rules of the EU Common Commercial Policy created the effect of establishment of marketing of agri-food products, as well as improvement of positive trading balance. It resulted from removing of all constraints in mutual trade in agri-food products between the “old”, as well as the “new” EU member states. In case of Poland, the high dynamic of growth of course of trade was observed in the scope of animal products, especially in the scope of dairy products. Lower prices of the Polish and Lithuanian products were the factors stimulating export of dairy products to the EU countries and providing competitive advantage. A pronounced drop of value of exported products was recorded only in 2009 both in Poland and in Lithuania. This situation resulted from the economic crisis which lead to decreased import demand and lowered prices of dairy products across the world. It is also worth to pay attention to import in trade in milk products, which between 2003 and 2010 showed continuous increase. Even though Germany is still the main supplier

of dairy products to Poland, Lithuania is also of significance among the closest partners. In case of Lithuania, Latvia and Poland are the basic transactors supplying dairy products.

Domestic consumption of milk and milk products in Poland and in Lithuania is significantly lower than in the countries of Northern Europe, such as Denmark or Holland, and in the Scandinavian countries, where similar models of food consumption exist (Seremak-Bulge, 2012). It should also be noted that, so far, production of milk grew faster than consumption. In consequence, it resulted in excess in supply over demand and in self-efficiency in covering home demand for dairy products.

Finally, it should be highlighted that Poland's and Lithuania's accession to the European Union accelerated many positive changes in economies of both countries, and opened new perspectives for development. More and more frequent opinions of observers of economic markets and their thoughts on the closeness between Poland and Lithuania, whose mutual history oftentimes intertwined, are not without significance. Amongst economic reporters you can more often hear: "The Polish–Lithuanian Commonwealth (federation including the Crown of the Polish Kingdom and the Grand Duchy of Lithuania) once existed, now the Baltic Functional Airspace Block – common airspace of the Republic of Poland and of the Republic of Lithuania exists. Why, then, shouldn't there be a Milk Republic, in the sector of dairy, in the future?"

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AN EMPIRICAL INVESTIGATION OF THE ROLE OF FDI ON WAGE INEQUALITY IN TRANSITION ECONOMIES

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ABSTRACT

The last two decades have been characterised by a rise in income and wage inequality in a wide range of countries, including transition countries. The rise in globalisation (mainly measured by trade and FDI) is one major factor explaining this increasing wage inequality (Te Velde, 2003; OECD-ILO, 2008; Mahutga and Bandelj, 2008; Franco and Gerussi, 2010; Figini and Görg, 2011). International trade and foreign direct investment have increased significantly in transition economies during the transition period, which has motivated scholars to examine the impact of these factors on labour market and more specifically wage inequality. This paper aims to examine whether FDI plays a major role in explaining the pattern of wage inequality in selected transition countries through an increase in the relative demand for skilled workers. The analysis presented in the previous research suggested that the net effect of FDI on wage inequality will depend on how large are the relative skill wage differences in foreign-owned firms and domestic owned firms, the relative skill-intensity of employment in foreign-owned firms compared to domestic ones and the relative size of the foreign-owned sector (Zulfiu-Alili, 2014).

This investigation has been conducted using two data sets. First, the Gini coefficient is used to measure wage inequality for the period from 1993 to 2008 for 19 transition countries. Second, we compute Gini coefficients on the average wages per employee across four digit level of ISIC manufacturing industries for 20 countries from 1992-2007. A cross-country empirical investigation indicates a positive relationship between FDI and wage inequality in nineteen transition countries.

1. INTRODUCTION

International trade and foreign direct investment have increased significantly in transition economies during the transition period, which has motivated scholars to examine the impact of these factors on labour market and more specifically wage inequality. This paper aims to examine whether FDI plays a major role in explaining the pattern of wage inequality in selected transition countries through an increase in the relative demand for skilled workers. The analysis presented in the previous research suggested that the net effect of FDI on wage inequality will depend on how large are the relative skill wage differences in foreign-owned

firms and domestic owned firms, the relative skill-intensity of employment in foreign-owned firms compared to domestic ones and the relative size of the foreign-owned sector (Zulfiu-Alili, 2014). Feenstra and Hanson (2001) argue that both trade in intermediate inputs and skilled-biased technological change have decreased the demand for low skilled labour and increased the relative demand and wages of the higher skilled. In addition, “as international trade and capital mobility increase, an international product cycle becomes established with specialization in new goods and services in those economies with decentralized wages and ‘employment at will’” (Adnett, 2001, p.355).

In assessing the causes of wage inequality most studies utilise the Gini coefficient as the measure of inequality. The size of these coefficients has increased considerably after 1990s in transition countries (Milanovic, 1999; Milanovic, 2011) and we attributed these increases to a range of factors, such as globalisation, skilled-biased technological change, differential access to schooling, unemployment and institutional differences. Therefore in addition to FDI we add these control variables to investigate the relationship of these factors with wage inequality. The previous reviews of theoretical and empirical studies on wage inequality indicate that the determinants of increasing wage inequality are ultimately an empirical question, one which we aim to examine in this paper. Though, as Jensen and Rosas (2007) argue one should approach this analysis very carefully since potential issues of reverse causality, selection bias, and omitted variables can lead to spurious results. Accordingly, in section 4 several model specification and tests have been used to obtain consistent estimates and to check for the robustness of the results. Due to missing data in some years over the period under investigation (1990 to 2008), the study is using unbalanced panel data for nineteen transition countries and fixed effects model to account for the presence of unobserved heterogeneity across countries and potential endogeneity of FDI with wage inequality. The cross-country empirical investigation of the role of FDI on wage inequality has been conducted using two data sets. First, the Gini coefficient is used to measure wage inequality for the period from 1993 to 2008 for 19 transition countries. Second, we compute Gini coefficients on the average wages per employee across four digit level of ISIC manufacturing industries for 20 countries from 1992-2007.

The remainder of this paper is organised as follows. In Section 2 we build the empirical model for a cross-country empirical investigation of the role of FDI. We discuss the data and descriptive statistics of the variables of interest in Section 3. Section 4 explains and justifies the chosen approach to estimate the model. Section 5 examines and interprets the results of the wage inequality model using different wage inequality measures as robustness checks. The last section is devoted to concluding remarks.

2. MODEL SPECIFICATION

This paper aims to investigate the effect of FDI and other control variables suggested by theory on wage inequality. Following the theoretical discussion and the previous empirical literature on wage inequality the following basic equation is specified:

$$Inequality_{it} = \beta_0 + \beta_1 FDI_{it} + \beta_2 FDI_{it}^2 + \beta_3 X_{it} + \lambda_c + \varepsilon_{it} \quad (1)$$

where i indexes countries, and t the time period. Inequality is a measure of wage inequality, the *Gini* coefficients for each country-year are the chosen measure. The Gini coefficient is a common measure of dispersion in studies investigating inequality in income, however, studies using Gini coefficient to assess inequality in wages are limited. To check for the robustness of

the results we compute an alternative Gini coefficient (GINI2) which will be explained in the next section. Investigating whether FDI improves or worsens inequality in wages we include the FDI variable which measures inward foreign direct capital as a percentage of GDP in the country. The stock of FDI is chosen rather than the inflow in order to reflect the long-term effects, since FDI stocks contribute to the stock of general-purpose technology available in the economy (Figini and Görg, 2011).

Considering the previous theoretical discussion, FDI may increase labour market inequality by increasing the relative demand for skilled labour and raising the skilled wage premium. There is supporting empirical evidence, Bruno et al., 2004; Mahutga and Bandelj, 2008; Commander and Kollo, 2008; Franco and Gerussi, 2010; Figini and Görg, 2011, for this causation, therefore we expect to find a positive relationship between FDI and wage inequality. However, as FDI increases in a country it may reduce wage inequality, in long run, as a result of the increased supply of skilled labour force. To control for this possible non-linear effect of inward FDI the squared term of FDI is added in the wage inequality equation. X is a vector of control variables deduced from theory to affect wage inequality, namely domestic investment, trade, GDP per capita, education, unemployment and institutional differences; λ is a full set of time dummies and e is the error term.

In addition to FDI, domestic investment is also introduced as a proxy for technological change. The higher the rate of domestic investment in a country, other things equal, the more likely to be the skill-biased technological progress, thereby increasing the proportion of skilled workers and hence the wage differential between skilled and unskilled workers. Accordingly the expected sign of the domestic investment variable is positive. In addition, a trade variable (the sum of imports and exports as a share of GDP) is included in the model to control for the effect of increased trade volumes on wage inequality. With respect to trade openness H-O theory suggests that great openness to trade should reduce wage inequality in developing countries by increasing the relative demand for unskilled labour and narrow the wage gap between skilled and unskilled workers. However, empirical studies such as Peter, 2003; Onaran and Stockhammer, 2008; indicate that trade liberalisation can increase wage differential between skilled and unskilled workers as a result of an increase in the returns of the skilled labour. Increases in GDP per capita should be associated with reductions in wage inequality as suggested by the Kuznets hypothesis. For this reason GDP per capita is introduced into the model, representing the level of economic development of a country. In order to test for the supply side of the labour market we include the level of education in the model. Two alternative measures of this control variable are used: the tertiary school enrolment (% gross) and the proportion of the labour force who have completed tertiary education (% of total). Using enrolment rates may not be appropriate for investigating wage inequality since this proxy captures educational attainment amongst the future potential labour force, whereas the wage inequality is likely to be affected by the level of education of the current labour force. Therefore a second proxy, the proportion of the labour force with tertiary education, is also included in the model. Other things being equal, an upward shift in the supply of more educated/skilled workers should depress the skill premium and lower wage inequality between skilled and unskilled workers. We additionally control for unemployment and institutional differences that were indicated as potentially important determinants of wage inequality in the literature (Aghion and Blanchard, 1994; Krugman, 1994; Boeri and Terrell, 2002; Biewen and Juhasz, 2010). Most of transition countries are characterised by high unemployment rates and low unemployment benefits or no safety nets in terms of benefits. This may affect the distribution of wages by lowering the wages of less skilled workers contributing to increases in wage inequality (Boeri and Terrell, 2002). To

capture institutional differences in the labour market the Index of Economic Freedom (IEF) is included in the wage inequality model. The expected relationship between the IEF and wage inequality is expected to be positive since higher values of this index for a country imply less interference in the market, for example a weaker influence of unions and minimum wage legislation, leading to higher wage inequality. Data and descriptive statistics of the variables used are discussed in the following section.

3. DATA AND DESCRIPTIVE STATISTICS

Wage inequality is measured by the GINI coefficient which ranges from 0 to 1, where 0 represents complete equality (all individuals receive equal wages) and 1 represents the highest level of inequality. The chosen Gini coefficient is the distribution of earnings, which refers to monthly wages with bonuses, for full-time employees as reported by employers. Data on the Gini coefficient (labelled as GINI1) were obtained from the *TRANSMONEE* (2010) database. Using the GINI1 variable as a dependent variable we can estimate equation 1 for the period 1993 to 2008, however with some gaps due to missing values of GINI1 for different years and countries. The number of countries in the database using GINI1 is 18 transition economies with 195 GINI1 observations. Table 1 presents summary statistics of the variables included in the regressions, whereas Appendix 1 and 2 (a) and (b) presents further details on variable definition according to the data source and summary statistics of the countries included in sample. In addition, the alternative measures of wage inequality is used, namely the GINI2 coefficients for each country-year. This alternative measure is labeled GINI2 and is calculated following Figini and Görg (2011) using data on the average wages per employee across four digit level of ISIC manufacturing industries in country *i* at time *t*, weighted by the number of employees in each sector. Data for this variable are obtained from the *UNIDO Industrial Statistics Database* (2010). Dataset includes information on 19 transition economies for the period of 15 years (1993-2007), generating an unbalanced panel with 201 observations of GINI2.

Table 1. Summary statistics of the variables of interest, GINI1:1993-2008; GINI2:1993-2007

Variable label	Variable name	Expected sign ¹	Mean	Std. Dev.	Min	Max	Missing Obs.
Gini	GINI1		0.36	0.07	0.23	0.52	106
Gini-UNIDO	GINI2		0.42	0.07	0.21	0.59	0
FDI stock (% of GDP)	FDI	+, -	21.92	16.51	0.36	85.86	7
FDI inward stock in manufacturing	FDIM	+, -	5051.68	7054.49	13.6	32475.8	81
Domestic Investment (% of GDP)	DOM	+	17.47	5.16	1.84	29.79	2
Trade (% of GDP)	TRADE	?	97.64	27.67	44.25	172.79	0
GDP per capita	GDP	+, -	7705.12	5401.928	1003.97	29574.1	2
Tertiary school enrolment (%)	EDU	-	41.92	18.33	11.64	86.71	26
Labour force with tertiary education (%)	LFEDU	-	21.82	13.98	2.4	66.1	107
Unemployment rate	UN	+	11.54	6.73	3.9	37.3	12
Index of Economic Freedom	IEF	+	55.37	9.11	30	76.1	45

¹ Where (+, -) indicates an expected non-linear effect of the variable to wage inequality, whereas (?) indicates that the expected effect is ambiguous, for example according to H-O theory trade should have a decreasing effect on wage inequality, however there is empirical evidence that trade increases wage inequality.

The inward FDI stock as a percentage of GDP (FDI) is used as a proxy to identify the effect of inward FDI on wage inequality. To account for depreciation this variable is measured as the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprises. Data on FDI are obtained from *UNCTADSTAT* (2011). The number of observations of FDI in the estimated models differs depending on the number of countries and years included in the database. Domestic investment (DOM) is defined as the gross fixed capital formation (formerly gross domestic fixed investment) as a percentage of GDP, after deducting FDI inflow. Both the gross fixed capital formation (% of GDP) and FDI inflow (% of GDP) are taken from the World Development Indicators (*WDI*, 2010) available from the *World Bank*. TRADE is the sum of exports and imports of goods and services measured as a share of GDP. Data on TRADE are obtained from *World Development Indicators (WDI, 2010)*. The proxy for the level of economic development, the Gross Domestic Product (GDP) is based on purchasing-power-parity (PPP) per capita GDP in current international dollars² to take into account the price differentials across countries. Data are obtained from *International Monetary Fund (IMF), World Economic Outlook Database (2010)*. In addition, two proxies for education are used, EDU and LFEDU. EDU is defined as the tertiary school enrolment as a percentage of gross enrolment ratio, which is the ratio of total enrolment regardless of age, to the population of the age group that officially corresponds to the level of tertiary education. Data for this proxy are obtained from *World Development Indicators (WDI, 2010)*. As explained in the previous section enrolment rates may not be the best proxy for the level of education of the labour force and studies using this measure may be misspecified. Instead a better proxy could be education according to the qualification of the workforce or employment according to education. *World Development Indicators (WDI)* and *Global Development Finance (GDF)* provide information on labour force with tertiary education as a percentage of total labour force (LFEDU) which is considered a better proxy for the supply side of skilled workers, but as it can be seen from Table 1 there are many missing values for this variable for the countries in the sample, therefore the use of both proxies is necessary. Data on unemployment rate (UN) as a percentage of total labour force come from *IMF, World Economic Outlook Database (2010)*. The proxy for institutions, the last explanatory variable, is the Index of Economic Freedom (IEF). It is a measure of ten components of economic freedom, assigning a grade in each using a scale from 0 to 100, where 100 represents the maximum freedom. The ten component scores are then averaged to give an overall economic freedom score for each country. The ten components of economic freedom are: Business Freedom; Trade Freedom; Fiscal Freedom; Government Spending; Monetary Freedom; Investment Freedom; Financial Freedom; Property Rights; Freedom from Corruption; Labour Freedom. Data for this measure come from *The Heritage Foundation (2011)*.

4. EMPIRICAL METHODOLOGY

This section is discussing the empirical methodology used to choose the appropriate estimation technique. Following the conventional procedure for panel data we have compared the Ordinary Least Squares (OLS), Fixed Effects (FE) and Random Effects (RE) models. As discussed below the appropriate estimator seems to be the FE model. To check if the model is misspecified diagnostic tests have been applied to the chosen model. The common problems associated with panel estimations have been investigated such as slope homogeneity, cross-sectional dependence in the error, groupwise heteroscedasticity, serial correlation in the errors and normality of the errors. All these tests are explained below and summarised in Table 2.

² An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. The Implied PPP conversion rate is the national currency per current international dollar.

Robust standard errors are used to account for the heteroscedasticity problem. As a robustness check the estimates of the basic equation are replicated by using the GINI2 coefficients as a dependent variable.

According to the results explained in Table 2 and Table 3, FE is the preferred model that is also more appropriate for small samples because the fixed model is estimated by OLS, it may have better small sample properties than a random effects model (Pugh, 2008) and can be estimated for unbalanced panels as it is the case here. The fixed effects model has constant slopes but intercepts differ according to the cross-sectional group, i.e. by country, allowing for individual country heterogeneity and accounting for potential omitted variables and misspecification. In fixed effects (LSDV) model the effects of explanatory variables are estimated only from within-group variation (Greene, 2002). The basic static wage inequality model is estimated with period dummy variables, in order to minimise the cross-country correlation in the error terms arising from economic cycle effects as a result of the transition process. These dummy variables are named according to the year they represent, starting from 1993 to 2008. It is an estimation issue whether FDI should be considered as an endogenous variable. Inward FDI flows at the national level are hypothesised to be determined by international differences in the return to capital, which are largely exogenous to local labour markets (Feenstra and Hanson, 1995). However, we cannot completely exclude the possibility that wage inequality is a determinant of FDI. The problem of inverse causality could occur since FDI may locate to areas with lower wages to save costs or to areas characterised with higher level of inequality, as well as imports and exports may be stimulated by high rates of inequality (Franco and Gerussi, 2010). In applied econometrics, Wooldridge (2002) indicates that endogeneity usually arises in one of three ways: omitted variables which appear when additional potentially relevant variables cannot be included due to data unavailability; measurement error is the case of measuring the (partial) effect of a variable with only an imperfect measure of it; and simultaneity occurs when at least one of the explanatory variables is determined along with the dependent variable. One of the most used methods to deal with the endogeneity problem is the GMM estimator proposed by Arellano-Bond (1991) and Arellano-Bover (1995)/Blundell-Bond (1998) introduced also by Roodman (2006). As Roodman argues, this is an appropriate approach for situations with “small T, large N panels, meaning few time periods and many individuals; with independent variables that are not strictly exogenous, meaning correlated with past and possibly current realizations of the error; with fixed effects; and with heteroskedasticity and autocorrelation within individuals” (p.1), which is not case of the present study since T and N are close to each other (T=16, N=19). Another way of dealing with the endogeneity problem is to use instrumental variables (IV) methods (Baltagi, 2005, p. 113). However, finding a good instrumental variable for an endogenous explanatory variable is in this case very difficult given the limitations of the available data. Under the assumption that the correlation of FDI with the error term is fixed over time, controlling for country fixed effects alleviates the problem of potential endogeneity (Figini and Görg, 2011). For this reason, a Fixed Effects model has been employed.

Table 2. Comparison of OLS, FE and RE using GINI1

Tests	T-statistic (TS)	Prob.	<>	CV (5%)	Decision
F test that all $u_{-i}=0$:	F(18,119)=21.35	0.00	>	1.69	If TS>CV → Reject H_0 (Supports Fixed Effects)
$H_0: \sigma_u^2=0$	chi2(1) = 119.97	0.00	>	3.84	If TS>CV → Reject H_0 (Supports Random Effects)
H_0 : difference in coefficients not systematic	chi2(21) =150.84	0.00	>	32.67	If TS>CV → Reject H_0 (Supports Fixed Effects)

Table 3. Comparison of OLS, FE and RE using GINI2

Tests	T-statistic (TS)	Prob.	<>	CV (5%)	Decision
F test that all $u_i=0$:	F(18,134)= 27.68	0.00	>	1.68	If TS>CV → Reject H_0 (Supports Fixed Effects)
$H_0: \sigma_u^2=0$	chi2(1) = 293.66	0.00	>	3.84	If TS>CV → Reject H_0 (Supports Random Effects)
H_0 : difference in coefficients not systematic	chi2(19)=26.44	0.11	<	30.14	If TS<CV → There is insufficient evidence to reject H_0 (RE can be estimated)

In order to achieve the best possible statistical specification diagnostic testing should be used. This can be difficult in panel data. Diagnostics for panel analysis are not well developed, especially for unbalanced and small panels, which we have in this case. However diagnostic testing can still provide some useful indicators, therefore diagnostics have been applied to the chosen FE model both in levels and log-linear form. The second approach is preferred since on checking for normality the test and the plot of residuals indicate the presence of non-normality in levels and serial correlation is also improved with logs when using GINI 1 as dependent variable. For comparison with the above results the estimates of the basic equation are replicated by using GINI2. Since GINI2 is calculated in manufacturing industries the FDI inward stock in manufacturing is included in the second step of the estimations. Table 4 and Table 5 summarises the diagnostic test results of the log-linear specification using GINI1 and GINI2 as dependent variable.

Table 4. Model diagnostics using GINI1

Tests	T-statistic (TS)	Prob.	<>	CV (5%)	Decision
Slope homogeneity $H_0: \beta_i = \beta$	chi2(70) = 1547.85	0.00	>	90.53	If TS>CV → Reject H_0 (No slope homogeneity)
Cross-sectional dependence in the errors H_0 : Zero cross-sectional dependence	Without Time DVs	0.88			Both tests suggest that there is insufficient evidence to reject H_0 .
	Pesarans's test= -0.150				
	Friedman's test= 3.920	0.92			
	With Time DVs				
	Pesarans's test= -1.022	0.31			
	Friedman's test= 2.560	0.98			
Groupwise heteroskedasticity H_0 : Homoscedasticity	chi2 (18) = 136.59	0.00	>	28.87	If TS>CV → Reject H_0 (Heteroskedasticity)
Serial correlation H_0 : No 1 st order autocorrelation	F(1, 13) = 4.19	0.06	<	4.67	If TS<CV → There is insufficient evidence to reject H_0
Normality of the errors H_0 : Normally distributed	adj chi2(2) =4.66	0.09	<	5.99	If TS<CV → There is insufficient evidence to reject H_0

Comparing Table 4 with Table 5, the results suggest no slope homogeneity, heteroscedasticity, serial correlation and the residuals are normally distributed. The problem of heteroscedasticity and serial correlation is addressed using Driscoll-Kraay standard errors. Given that the unobservable common factors are uncorrelated with the explanatory variables, the coefficient estimates from FE estimator are still consistent but inefficient and the standard

error estimates of commonly applied covariance matrix estimation techniques are biased (Hoechle, 2007). “Fortunately, Driscoll and Kraay (1998) propose a nonparametric covariance matrix estimator that produces heteroskedasticity- and autocorrelation-consistent standard errors that are robust to general forms of spatial and temporal dependence” (Hoechle, 2007, p.282). The Driscoll-Kraay standard errors syntax in Stata is `xtscc` estimated by FE regression. The `xtscc` programme can be used both with balanced and unbalanced panels and can handle missing values (Hoechle, 2007), making it appropriate for use in this study.

Table 5. Model diagnostics using GINI2 and FDIM

Tests	T-statistic (TS)	Prob.	\diamond	CV (5%)	Decision
Slope homogeneity $H_0: \beta_i = \beta$	Chi2(56)= 5857.36	0.00	>	74.47	If TS>CV \rightarrow Reject H_0 (No slope homogeneity)
Cross-sectional dependence in the errors H_0 :Zero cross dependence	The panel is unbalanced and there are insufficient observations, so the tests could not be performed.				
Groupwise heteroskedasticity H_0 :Homoscedasticity	chi2 (14)= 590.44	0.00	>	23.68	If TS>CV \rightarrow Reject H_0 (Heteroskedasticity)
Serial correlation H_0 :No 1 st -order autocorrelation	F(1,13)= 31.99	0.00	>	4.67	If TS>CV \rightarrow Reject H_0 (Serial correlation)
Normality of the errors H_0 :Normally distributed	adj chi2(2) = 1.61	0.44	<	5.99	If TS<CV \rightarrow There is insufficient evidence to reject H_0

5. ESTIMATION RESULTS

This section presents estimation results based on the two alternative measures of wage inequality. Table 6 presents the results of estimating equation (1) in log form with the GINI1 coefficients as the dependent variable. Columns (1) and (2) provide results for regressions of FE using Driscoll-Kraay standard errors, respectively including the simple FDI term and the quadratic specification. Columns (3) and (4) replicate the estimations adding LFEDU and IEF in the model, with and without SQFDI. Results of the GINI2 coefficients as a dependent variable and using FDI in manufacturing (FDIM) instead of FDI (% of GDP) are presented in Table 7. Overall, the results indicate a positive relationship between FDI stock and wage inequality in transition countries.

Discussing the results when GINI1 is used as a dependent variable, Table 6 indicates that the FDI coefficient (FDI stock as percentage of GDP) is positive and significant in the specifications in which the squared term of FDI is not included, and it is very similar in terms of magnitude. This suggests that if the share of FDI in GDP increases by 1% wage inequality will increase for 0.05% (column 1); or by 0.06% including all variables in the model (column 3). There is no clear evidence of a concave relationship between FDI and wage inequality in transition countries, which may not be surprising considering that transition economies have not yet attracted high levels of FDI. The SQFDI is significant only in column (2) at 10% level of significance. The coefficient of DOM does not have the expected sign and is significant at 5% in the regressions using all variables in columns (3) and (4). A higher rate of domestic investment, other things equal, should be associated with more capital-intensive and skill-

intensive production that should, other things being equal, increase inequality. However, the negative sign in this case may indicate that domestic investment in the representative transition economies are associated with less-capital and less-skill intensive production leading to reductions in wage inequality. The coefficient on trade is positive and significant at 1% and 5% when including all variables indicating that 1% increase in the share of trade in GDP raises wage inequality by 0.14%. The coefficient of GDP per capita is negative and significant indicating that the higher is the level of development of the country the lower is the wage inequality. The impact of education seems to differ across different specifications. The EDU coefficients look very similar in terms of magnitude and statistical significance in column (1) and (2) suggesting that wage inequality increases as the education of the potential labour force increases that is contrary to the prediction of orthodox theory. However, as argued above, enrolment rates may not be the best proxy for the workforce's level of education since wage inequality is more likely to be affected by the level of education of the current, rather than future, workers. The results of the alternative measure of education (LFEDU) significant at 1% and 5% level of significance suggest that for 1% increase in LFEDU decreases wage inequality by around 0.05%, in line with our theoretical framework. Unemployment also does not have the expected sign but is not significant in all specifications. Since unemployment rate is higher among less skilled workers (ILO, 2007; Novkowska, 2008; ILO, 2010; ILO, 2012) these results might indicate that the unskilled workers are more likely to leave the labour market contributing to decreasing wage inequality by leaving more space to educated and skilled labour that are more likely receiving similar wages. The last variable included in the model, IEF, has the expected positive sign and is significant at 1% suggesting that, as anticipated, greater economic freedom is associated, other things being equal, with greater wage inequality. Wage inequality increases by 0.39% for a 1% increase in the IEF.

Table 6. Fixed effects regressions (dependent variable is GINI1)

	Drisc/Kraay Std.Err.	Drisc/Kraay Std.Err.	Drisc/Kraay Std.Err.	Drisc/Kraay Std.Err.
VARIABLES	(1) GINI1	(2) GINI1	(3) GINI1	(4) GINI1
FDI	0.051*** (0.015)	0.026 (0.018)	0.065*** (0.008)	0.049** (0.019)
SQFDI		0.008* (0.004)		0.005 (0.005)
DOM	-0.029 (0.021)	-0.022 (0.020)	-0.062** (0.024)	-0.055** (0.022)
TRADE	0.051 (0.039)	0.058 (0.038)	0.144*** (0.025)	0.138*** (0.026)
GDP	-0.231** (0.086)	-0.204** (0.088)	-0.244*** (0.056)	-0.259*** (0.061)
EDU	0.139*** (0.042)	0.119*** (0.045)	0.065* (0.035)	0.063* (0.035)
LFEDU			-0.049** (0.017)	-0.048*** (0.015)
UN	-0.033 (0.027)	-0.030 (0.029)	-0.008 (0.023)	-0.012 (0.025)
IEF			0.396*** (0.084)	0.391*** (0.084)
Constant	0.126 (0.888)	-0.078 (0.835)	-1.205*** (0.318)	-1.023** (0.464)
Observations	157	157	70	70
Number of groups	18	18	13	13

All variables are in log form
 *** p<0.01, ** p<0.05, * p<0.1
 Regressions include a full set of time dummies

Table 7. Fixed effects regressions (dependent variable is GINI2)

VARIABLES	Drisc/Kraay	Drisc/Kraay
	Std.Err.	Std.Err.
	(1)	(2)
	GINI2	GINI2
FDIM	-0.029 (0.037)	0.277*** (0.104)
SQFDIM		-0.023*** (0.006)
DOM	0.083*** (0.012)	0.068*** (0.017)
TRADE	-0.135 (0.108)	-0.123 (0.091)
GDP	-0.436** (0.172)	-0.558*** (0.141)
EDU	-0.300*** (0.077)	-0.216*** (0.065)
UN	0.092** (0.037)	0.091*** (0.025)
Constant	4.096** (1.874)	4.259*** (1.337)
Observations	114	114
Number of groups	14	14
All variables are in log form		
*** p<0.01, ** p<0.05, * p<0.1		
Regressions include a full set of time dummies		

Results using GINI2 as the dependent variable and FDIM to measure the impact of foreign direct investment in manufacturing sector are presented in Table 7. A positive and significant relationship between FDI and wage inequality is supported in column (2). There is evidence of a quadratic relationship between FDI and wage inequality. Calculating the net effect³ of these two terms for the transition economies included in the sample indicates that 1% increase in the mean of FDIM decreases wage inequality by 0.11%. If the mean of FDIM increases by 5%, the GINI2 coefficient will decrease by 0.13%. Estimating the turning point we find that wage inequality increases until the level of the mean of FDIM reaches 465.57 MN Euro and decreases afterwards. Whereas the net effect for the case of Macedonia indicates that a 1% increase in FDIM, at the level of its mean, decreases GINI2 by 0.001% for the period from 1997 to 2007. The mean of FDIM for all transition countries included in the sample is 5051.68 MN Euro in the period from 1993 to 2007 and the mean of FDIM for the case of Macedonia is 478.57 MN Euro for the period from 1997 to 2007. The impact of DOM variable in this case has the expected positive sign and is significant at 1% and 5% level of significance, suggesting that in the manufacturing sector a 1% increase in DOM is associated with a 0.08% (column 1) increase in GINI2. This suggests that domestic investment in this sector is concentrated in more capital-intensive and skill-intensive production and hence increases wage inequality in manufacturing. The TRADE variable is not significant in all specifications, whereas a higher GDP is again associated with reductions in wage inequality. The coefficient on EDU, as expected, is negative and significant, suggesting that 1% increase in the tertiary school enrolment decreases wage inequality by 0.3%. In contrast to the previous results using GINI1, there is now evidence that increases in the unemployment rate increase wage inequality, which may indicate that higher unemployment affects the distribution of wages by lowering the wages of less skilled workers in the manufacturing sector.

³ The net effect is calculated based on this formula:

$$ny = \alpha + \beta_1 \ln x + \beta_2 (\ln x)^2; \frac{dny}{dx} = \beta_1 \frac{1}{x} + 2\beta_2 (\ln x) \frac{1}{x}; \frac{dy}{dx} * \frac{x}{y} = [\beta_1 + 2\beta_2 \ln x] \left(\frac{1}{x}\right); \frac{dy}{dx} * \frac{x}{y} = \beta_1 + 2\beta_2 \ln x$$

where the mean value of the relevant independent variable is used in the calculations.

Specifications including all variables, in which case the number of observations falls to 85, do not result in any significant coefficients, with the exception of EDU and UN at 10% level of significance and therefore they are not reported.

6. CONCLUSION

A large strand of the literature has investigated the complex nature of wage inequality in developed and developing countries, however there is limited evidence for transition economies. The previous empirical evidence suggests that wage inequality has increased during the transition period and this increase can partly be explained by globalisation factors such as trade and FDI. Using two alternative measures of wage inequality, namely GINI1 and GINI2 coefficients this paper examines the effect of FDI on wage inequality in the selected transition countries. Several model specification and tests have been used to obtain consistent estimates and to check for the robustness of the results. The results indicate that a rising share of FDI in GDP increases wage inequality in transition economies in the period from 1993 to 2008. Results using GINI1 indicate that wage inequality increases with inward FDI stock in GDP and there is no robust evidence that this effect is non-linear. Results using the Gini in the manufacturing sector (GINI2) and FDI inward stock in manufacturing do suggest the presence of a non-linear effect: wage inequality increases with FDI inward stock in manufacturing but this effect diminishes with further increases in FDI. The net effect indicates that wage inequality decreases with further increases at the mean level of inward FDI stock in manufacturing. This may suggest that FDI in manufacturing industries in the representative transition economies are associated with less-capital and less-skill intensive production leading to reductions in wage inequality. Among the control variables we find some support for the Kuznets hypothesis, i.e. increases in GDP per capita are associated with reductions in wage inequality. In addition, there is no evidence for the H-O theory that greater trade openness reduces wage inequality. In line with our theoretical discussion, increases in the supply of more educated workers (LFEDU) lowers wage inequality in transition economies. In sum, the empirical evidence supports the hypothesis that an increased FDI inward stock as a share of GDP increases wage inequality in transition economies, however this relationship may be a complex one. Differences in average wages, wage differentials, employment shares of skilled workers and relative size of the foreign-owned sector are all likely to be important for the behaviour of wage inequality.

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Appendix 1-Variable name, variable label, variable definition⁴ and data sources

Variable label	Variable name	Variable definition	Data source
Gini (dependent variable)	GINI1	Distribution of earnings: Gini coefficient Earnings refer to monthly wages, with bonuses, for full-time employees as reported by employers.	TRANSMONEE, 2010.
Gini-UNIDO (dependent variable)	GINI2	GINI2 is own calculation using data on the average wages per employee (in current US Dollars) across four digit level of ISIC manufacturing industries in country <i>i</i> at time <i>t</i> , weighted by the number of employees in each sector. Wages and salaries include all payments in cash or in kind paid to and quot; employees and quot; during the reference year in relation to work done for the establishment. Payments include: (a) direct wages and salaries; (b) remuneration for time not worked; (c) bonuses and gratuities; (d) housing allowances and family allowances paid directly by the employer; and (e) payments in kind. Excluded are employers contributions in respect of their employees paid to social security, pension and insurance schemes, as well as the benefits received by employees under these schemes and severance and termination pay. Number of employees- the number of persons engaged is defined as the total number of persons who worked in or for the <i>establishment</i> during the reference year. However, home workers are excluded. The concept covers working proprietors, active business partners and unpaid family workers as well as employees. The figures reported refer normally to the average number of persons engaged during the reference year, obtained as the sum of the and quot; average number of employees and quot; during the year and the total number of other persons engaged measured for a single period of the year. The number of employees is including all persons engaged other than working proprietors, active business partners and unpaid family workers. An "establishment" is ideally a unit that engages, under a single ownership or control, in one, or predominantly one, kind of activity at a single location; for example, workshop or factory.	UNIDO Industrial Statistics Database, 2010. The database is built around the International Standard Industries Classification (ISIC) code system, which classifies industries broadly along product lines, such as food, textiles, iron and steel.
FDI stock (% of GDP)	FDI	FDI stock (% of GDP) is the value of the share of their capital and reserves (including retained profits) attributable to the parent enterprise, plus the net indebtedness of affiliates to the parent enterprises.	UnctadStat, 2011.
FDI inward stock in manufacturing	FDIM	FDI inward stock in manufacturing, NACE 1 DIGIT Unit: EUR MN	The Vienna Institute for International Economic Studies , Database on Foreign Direct Investment(wiiv), 2011.

⁴ Variable definition is given according to the data source.

Domestic Investment (% of GDP)	DOM	<p>Domestic Investment is the gross fixed capital formation (% of GDP), (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. According to the 1993 SNA, net acquisitions of valuables are also considered capital formation.</p> <p>We deducted the FDI inflow (% of GDP) from gross fixed capital formation.</p> <p>FDI inflow (% of GDP) is the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP.</p>	World Development Indicators (WDI), Edition: December 2010.
Trade (% of GDP)	TRADE	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	World Development Indicators (WDI), Edition: December 2010.
GDP per capita	GDP	<p>Gross domestic product based on purchasing-power-parity (PPP) per capita GDP, Current international dollar.</p> <p>These data form the basis for the country weights used to generate the World Economic Outlook country group composites for the domestic economy.</p>	International Monetary Fund, World Economic Outlook Database, October 2010.
Tertiary school enrolment	EDU	School enrolment, tertiary (% gross). Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Tertiary education, whether or not to an advanced research qualification, normally requires, as a minimum condition of admission, the successful completion of education at the secondary level.	World Development Indicators (WDI), Edition: December 2010.
Labour force with tertiary education	LFEDU	Labour force with tertiary education (% of total). Labour force with tertiary education is the proportion of labour force that has a tertiary education, as a percentage of the total labour force.	Source: World dataBank: World Development Indicators (WDI) & Global Development Finance (GDF), April 2011.
Unemployment rate	UN	<p>Unemployment rate, percent of total labour force.</p> <p>Unemployment rate can be defined by either the national definition, the ILO harmonized definition, or the OECD harmonized definition. The OECD harmonized unemployment rate gives the number of unemployed persons as a percentage of the labour force (the total number of people employed plus unemployed). [OECD Main Economic Indicators, OECD, monthly] As defined by the International Labour Organization, unemployed workers are those who are currently not working but are willing and able to work for pay, currently available to work, and have actively searched for work. [ILO, http://www.ilo.org/public/english/bureau/stat/res/index.htm]</p>	International Monetary Fund, World Economic Outlook Database, October 2010.
Index of Economic Freedom	IEF	Index of Economic Freedom. It is a measure of ten components of economic freedom, assigning a grade in each using a scale from 0 to 100, where 100 represents the maximum freedom. The ten component scores are then averaged to give an overall economic freedom score for each country. The ten components of economic freedom are: Business Freedom; Trade Freedom; Fiscal Freedom; Government Spending; Monetary Freedom; Investment Freedom; Financial Freedom; Property Rights; Freedom from Corruption; Labour Freedom.	The Heritage Foundation, March 2011.

Appendix 2(a)-Gini coefficient (GINI 1) of earnings inequality for the countries included in the database, 1993-2008⁵

No.	Country	Year	GINI1 Mean	Std. Dev.	Min	Max
1	Armenia	1993-1995;2000	0.39	0.07	0.32	0.49
2	Belarus	1995-2008	0.34	0.01	0.31	0.37
3	Bulgaria	1993;1996;2002;2006	0.31	0.05	0.25	0.37
4	Czech Republic	1993-2005	0.26	0.01	0.25	0.28
5	Estonia	1997-2001	0.38	0.02	0.34	0.40
6	Hungary	1993-1994;1997;2001	0.34	0.03	0.32	0.39
7	Kazakhstan	2003-2006;2008	0.39	0.03	0.36	0.42
8	Kyrgyzstan	1993-2008	0.46	0.03	0.40	0.51
9	Latvia	1993-2004	0.33	0.02	0.28	0.35
10	Lithuania	1994-1999;2001-2004	0.37	0.02	0.35	0.39
11	Macedonia	1993-2008	0.28	0.02	0.24	0.32
12	Moldova	1993-1996;1998-2006	0.39	0.03	0.33	0.44
13	Poland	1993-1999;2004;2006	0.30	0.03	0.26	0.35
14	Romania	1993-2008	0.35	0.05	0.23	0.41
15	Russia	1994-1996;2001-2002;2004-2008	0.46	0.03	0.42	0.52
16	Serbia	2002-2008	0.32	0.01	0.31	0.35
17	Slovenia	1993-2008	0.30	0.02	0.28	0.36
18	Ukraine	1993;1996-2004;2006-2008	0.41	0.02	0.36	0.46

Appendix 2(b)- Calculated Gini (GINI2) coefficient of earnings inequality for the countries included in the database, 1993-2007

No.	Country	Year	GINI2 Mean	Std. Dev.	Min	Max
1	Albania	1998-2006	0.33	0.05	0.25	0.38
2	Azerbaijan	1997-2007	0.52	0.06	0.37	0.58
3	Bulgaria	1996-2006	0.45	0.05	0.39	0.54
4	Czech Republic	1995-2006	0.39	0.02	0.37	0.43
5	Estonia	2000-2007	0.36	0.02	0.33	0.40
6	Georgia	1998-2007	0.49	0.02	0.45	0.51
7	Hungary	1994-2006	0.38	0.02	0.36	0.42
8	Kazakhstan	1998-2007	0.48	0.03	0.43	0.52
9	Kyrgyzstan	1993-2003	0.47	0.03	0.43	0.55
10	Latvia	1993-2007	0.38	0.02	0.32	0.40
11	Lithuania	1993-1994;1996-2007	0.41	0.02	0.39	0.45
12	Macedonia	1997-2001;2003-2007	0.46	0.11	0.33	0.58
13	Moldova	1996-2006	0.29	0.04	0.21	0.36
14	Poland	1993-1995;2002-2006	0.36	0.02	0.33	0.39
15	Romania	2003-2007	0.49	0.03	0.45	0.53
16	Russia	1999-2007	0.44	0.04	0.38	0.48
17	Slovakia	1993-2006	0.40	0.03	0.36	0.45
18	Slovenia	1995-2007	0.41	0.01	0.38	0.44
19	Ukraine	2000-2007	0.58	0.01	0.57	0.59

⁵ Azerbaijan is excluded from the database when we run regressions using GINI1 since there is no data for unemployment for this country during the period of study.