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ΠΕΡΙΕΧΟΜΕΝΑ 13^{ΟΥ} ΔΙΕΘΝΟΥΣ ΣΥΝΕΔΡΙΟΥ

Organizing Committee of 13th International Conference	σελ 3
Scientific Committee of 13th International Conference	σελ 4
Business Intelligence Systems for SMEs. Problems and Potentials	
Papachristodoulou Ekavi, Koutsaki Margarita, Kirkos Efstathiosi.....	σελ 5-12
Contingent Valuation Method (CVM) for Agricultural Wastes in the Area of Central Macedonia in Greece	
Odysseas Kopsidas.....	σελ 13-19
European Electronic Customs System – The Digital Paperless Future	
Małgorzata Czermińska, Ph.D.....	σελ 20-38
Financial and fiscal crises, prices and EUR/USD rate of exchange	
Slawomir I. Bukowski, Joanna E. Bukowska.....	σελ 39-53
Foreign Currency Loans and Stability of the Banking System in Poland	
Grażyna A. Olszewska.....	σελ 54-67
Globalization and Regional Economic Integration in Africa. The new opportunities caused by Tripartite Free Trade Area (TFTA)	
Joanna Garlińska-Bielawska.....	σελ 68-78
International Patenting: An Application of Network Analysis	
Bachar Moussa, Nikos C. Varsakelis	σελ 79-91
Macroeconomic and industry-specific determinants of bank profitability before and during the financial crisis: Empirical evidence from Greece	
Zampara K., Giannopoulos M., Koufopoulos D.N.....	σελ 92-105
Multi-Level governance concept - complementary role of State in the European Union Economies of the 21st Century	
Jakub Kwaśny.....	σελ 106-116
“Neoclassical and technological catching-up as the channels of the convergence process in the European Union”	
dr Izabela Młynarzewska- Borowiec.....	σελ 117-139
Personal Income Tax Progressivity and Output Volatility in Poland	
Katarzyna Kalinowska.....	σελ 140-160
Quality of non-financial information reported by financial institutions. The example of Poland and Greece	
Marzanna Lament	σελ 161-171

Stock Exchange bonds as a source of financial capital for firms in Poland and in selected countries of UE

Łukasz Zięba.....σελ 172-188

HOW CAN WE SOLVE THE YOUTH UNEMPLOYMENT DILEMMA? “Soon, we will not speak for lost jobs but for a lost generation”

Achilleas Vassiliadis, Spyros Vassiliadis.....σελ 189-193

Ανάλυση των Χρηματοοικονομικών Καταστάσεων του Κλάδου των Οικοδομικών Χρωμάτων τη Δεκαετία 2005 – 2014 και η Επίδραση της Οικονομικής Κρίσης

Σαμαράς Ιωάννης, Στυλιανού Τάσος, Τζιντζίδης Σάββας.....σελ 194-206

Ασαφείς Χρονολογικές Σειρές Προβλέψεις Αφίξεων Τουριστών στην Κύπρο

Μαρίνα Σύρπη, Γεώργιος Κερίδης.....σελ 207-218

Η Τουριστική Διάσταση του Προγράμματος Φιλοξενίας Εμπορικών Επισκεπτών (Hosted Buyers Programme) της ΔΕΘ-HELEXPO. Μια Πρώτη Αποτίμηση για την Περίοδο 2014-2016

Βίκυ Δαλκράνη, Δημήτρης Κουρκουρίδης, Δρ. Κυριάκος Ποζρικίδης.....σελ 219-232

Μνημόνια και Συλλογικές Διαπραγματεύσεις: το διακύβευμα και οι συνέπειες της αποκέντρωσης

Θεόδωρος Κουτρούκης.....σελ 233-242

Οι προσδιοριστικοί παράγοντες της φορολογικής συμμόρφωσης και η συμβολή του φορολογικού ελέγχου στην διαμόρφωσή της

Λάζος Γρηγόριος, Κυριαζόπουλος Γεώργιοςσελ 243-253

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Business Intelligence Systems for SMEs. Problems and Potentials

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Abstract

According to research findings, the SMEs are facing problems such as excessively large volume of data, lack of information and lack of knowledge. Therefore, in order to take decisions on time, the managers of SMEs use mainly their experience, which implies a high risk of failure. The business intelligence is a useful and helpful tool, which brings many advantages and benefits to businesses. However, like any technology, this one is accompanied by some limitations that must be overcome businesses to enable them to develop. This paper summarizes current research findings addressing the issue of the development and application of Business Intelligence Systems for SMEs. The issues addressed are models for the estimation of the readiness of a SME to establish BI tools, alternative BI solutions for SMEs, benefits and challenges of BI in SMEs, implementation ways for BI systems in SMEs and finally, BI systems in cloud computing platforms. Research papers dealing with these issues are analyzed and their results are presented. This paper may contribute to the understanding of problems and potentials regarding the development and application of BI systems in SMEs.

Business Intelligence in SMEs

Despite the economic size of each company, access to relevant and important information is very important to ensure the success of the acquisition of a market share. The business intelligence is considered a very important tool to achieve business such a goal. The business intelligence systems are characterized by the difficulty and complexity to handle. Also economic factors are the ones that make many SMEs administrations not to proceed to the acquisition of a system. It is known that by primarily the applications of business intelligence was not accessible to SMEs. This is because the available systems are expensive, difficult to use and require excellent technological training of business staff. These applications meet the needs of large enterprises, as had all the appropriate resources for their proper functioning. With the evolution of technology, business intelligence suppliers have designed and developed applications and tools to meet small businesses real needs.

There are business intelligence systems that are available online. These systems are affordable and easy and they belong to the category of cloud systems. Such solutions are suitable for SMEs, as they do not incur additional installation and maintenance cost. Tools and IT systems applications are

not considered a privilege of large companies, as the services offered are designed for the needs and requirements of SMEs, which can be just as competitive and successful.

Readiness of an SME for BI

Hidayanto, Kristianto, and Shihab (2012) conducted research to assess the readiness of a SME to establish a business intelligence tool. For the development of the framework, the researchers used as their tools the Critical Success Factors and the Analytical Hierarchy Process. They focused on three categories of functions found in an SME. They focused their attention on the organization, process and technology applied. In any operation they explored and reviewed the relevant factors that are capable of extracting better conclusions.

The researchers chose the method of Analytical Hierarchy Process for the development of the proposed framework, because this method allows the analysis of a complex problem in a more simple structure and selects the most effective solutions that will lead the administration to better decisions (Taylor (2005), Cheng (1996)). The steps of the method defined by the researchers were three.

The first step is the decomposition of the model into three levels (objective criteria and alternatives). In the second step, are the comparisons between pairs of criteria and alternatives have been created. The comparison was made with a rating scale 1-9. The third and final step is the weight of each pair.

To be valid comparisons, the researchers chose the values were less than 0.1 (consistency ratio < 0.1). Then, they began to develop a framework which would apply in a real and not virtual enterprise. The frame as target raised the level of preparedness of business intelligence in an SME (level 1). Criteria joined the function categories of business (level 2), while the critical success factors were considered as alternatives (level 3). For the purpose of the study, Hidayanto et al. (2012) used an 18 factors based on the scientific literature references by Atre (2003), Williams & Williams (2004) and William & Koronios (2010).

Once the problem decomposition process was completed, the researchers proceeded to create pairs of criteria and alternatives, with the help of four specialists in business intelligence. Experts, using the Delphi technique, gave values to those which arose four comparisons: i) inter category pairwise comparison, ii) pairwise comparison for organizational category, iii) pairwise comparison for process category and iv) pairwise comparison for technology category. Finally, the validity of comparisons of each class of the consistency ratio was calculated (consistency ratio < 0.1) and calculated the weight of each factor.

To give a more accurate and fair decision about the value of each factor in business, the researchers used the e-GP model (electronic government procurement) Readiness Self-Assessment. Thus, they evaluated the level of readiness of each factor using a scale (0-3) measuring each factor's readiness level.

After the comprehensive development of the model, the researchers proceeded to its application to a real SME. They randomly chose a SME in Indonesia, which did not use a business intelligence system. Through semi-structured interviews assessed the level of preparedness of each factor separately and then multiplied by the weight factor of the level of preparedness. After, they

added all the results to give the final grade. The company managed to collect 58.05%. The result showed that although the company understood the importance of the factors for the implementation of business intelligence, had to face some obstacles and then proceed to the implementation of a B.I. tool

By applying a similar model, businesses will be able to analytically evaluate their readiness and then they can decide whether they will be able to deploy business intelligence software, as they may be confronted with unexpected situations that may arise during installation. Management should be aware of the real needs of the enterprise and to adopt the corresponding services where you can manage and support.

BI solutions for SMEs

Tutunea and Rus (2012) study alternative BI solutions for SMEs Depending on the needs of each company, the peculiarities of each company and some specific factors, there are three types of options that businesses can choose the one that suits the requirements and needs. In the first option, they ranked the solutions that mainly focus on data analysis with the help of Excel spreadsheets, OpenOfficeCalc, Lotus 1-2-3, computer graphics, what-if type analysis etc. As a second option, they set the commercial business intelligence solutions. Since the software tested, they found that there are two types of providers. The first category includes specialized software companies that provide exclusive tools for business intelligence. In the second category, they identified the companies that have greater variety of interest that is not focused exclusively on business intelligence services. As a third option, they ranked the open source solutions and tools for business intelligence (opensource). Enterprises can choose the suitable solution, taking into account the quality of the information provided, data analysis tools and visualizations, cost, accessibility and effectiveness of the decisions. Thus, companies depending on the resources choose the best solution that will bring advantages.

Benefits and Challenges of BI in SMEs

In this section are presented two surveys aiming at identifying the benefits and challenges of business intelligence adoption in small and medium enterprises. Also, through the research, they identified and the sections of its application. For this purpose were used two research studies by Scholz et al. (2010) and Nenzhelele (2014).

The first reference is the study of Scholz et al. (2010) who were able to identify the beneficial factors, challenges and types of SMEs that adopt a business intelligence tool.

The method applied was based on references of other authors and researchers. Their study was based on Exploratory Factor Analysis (E.F.A.), which succeeds to identify the perceived benefits and challenges of implementing business intelligence. Initially, to verify the suitability of the sample they used the KMO measure as proposed by Kaiser & Rice (1974). Then, they applied the MSA measure to validate the sample and then applied the PCA measure to extract relevant information. For a number of factors that have an impact on businesses, applied graphics and Eigenvalue with $EV > 1$ according to Thompson & Daniel (1996, p.200).

After identifying the strengths and challenges, they focused on identifying the type of businesses applying business intelligence. For this reason, they used the cluster analysis, namely the

k-means algorithm and the proximity measure ED. The numbers of clusters were defined by the use of FC measure (Fusion Coefficient) (Toms et al., 2001).

To collect the necessary data, the researchers turn to 4960 Saxon firms, where via e-mail, the operators responded to a questionnaire. In total they collected 452 questionnaires. From the research conducted, they managed to identify three main beneficial factors: improvements data support, improvements the decision process and savings. Each of these factors, accompanied with different advantages for the organization. On the other hand, they were able to identify the main challenge factors. These were: challenges depending on usage, challenges related to data and interfaces challenges. And in this case, each factor accompanied with distinct challenges. Finally through the cluster analysis, they were able to identify four categories of companies using business intelligence.

The research carried out by Scholz et al. (2010) showed that companies and organizations that do not have a business intelligence tool should not only focus on the positive effects that can generate its use. They should study and all those challenges and constraints that may arise (eg software errors, reduced resources, unnecessary costs, etc.). Through cluster analysis, they concluded that product-oriented companies have better prospects in the application of business intelligence. Also, through cluster analysis's BI providers can identify the real needs of SMEs.

In the second reference of the present section Nenzhelele and Pellissier (2014) identify in which business areas mainly applied business or competitive intelligence and whether they understand the concept. According to Bernstein (2011) competitive or business intelligence is formed by processing the data which produces information, processed information which produces knowledge and processed knowledge which leads to intelligence.

The data collection was done by using a questionnaire to a hundred SMEs in greater region of South Africa. Their original purpose was to discover whether SMEs are aware of the business intelligence and then to identify the main challenges they face. Also, they tried to find the sections where companies apply business intelligence. From the research, the researchers concluded that although companies understood the importance of business intelligence, they did not apply an equivalent tool. Businesses using a business intelligence tool asked about the main challenges and discovered that three restrictions are common to all businesses. The lack of time working with the system shows that small businesses do not have the needed time to manage a competitive intelligence system, the lack of human resources and economic factors were the main problems they face. The application area is not located in a particular part, but somewhere independently. This is because SMEs have no formal organizational structure, but very important role is the application of competitive intelligence in market research and marketing department. Apart from the various challenges and benefits identified, SMEs are trying to be more competitive to be able to achieve higher profits and more sales. In this case, stated that SMEs choose to spend more money and establish business intelligence software in market research and marketing departments.

Implementation ways for BI systems in SMEs

Frion and Yzquierdo-Hombrecher (2009) present a new competitive intelligence model for the management of large amounts of data and information entering the business. Initially they conducted a literature reference which focused mainly on the concept of business intelligence. The

second method was based on their long experience in competitive intelligence systems and their application mainly in small businesses.

From the literature search is found that the studies and research carried out is based on large companies. For this reason, the authors noticed that there are many different ways and methods to apply competitive intelligence. The literature survey completed with the presentation of the new method and the new competitive intelligence information management model developed. The model was called Method Acrie. From the research study conducted consider that takes five key competences SMEs to work properly competitive intelligence. These five capabilities are strategic thinking, improvement, distribution, protection and search information. The proposed model (Method Acrie) was created to help SMEs reach better decisions by managing a large data volume.

Cloud computing and BI

In the present section are presented two surveys which aim to present a new technology, business intelligence combined with cloud software.

The first report is based on the study made by Agostino et al. (2013) which identify the key success factors for the adoption of business intelligence to cloud level of SMEs and which should be the main features of the software in accordance with the suppliers and users of the respective products. By previous approaches based by Scholz et al. (2010) and Yeoh & Koronios (2010) there were used three categories of factors. The first class is distinguished from the organization, the second of the procedures and the third by technology.

The method of research conducted consisted of two stages. In the first stage, which was characterized as qualitative, four interviews were taken by experts in the field of business intelligence-cloud. The result of this stage was that the main factors for the adoption of business intelligence systems were reduced costs, installation and implementation time and quick response to user requests. In the second stage (quantitative phase) scholars gathered information from 36 companies through a questionnaire on the issue of B.I. The questionnaire created by Bryman & Bell (2011). Results from this stage showed that the main factors to adopt an enterprise business intelligence is the functionality of the system, continuous data access, rapid response to user requirements, the large amount of data management and the cost of implementation. Both stages showed that users are seeking easy tools to use as they have the necessary expertise. The economic factor plays a very important role because SMEs have quite limited resources. The cloud is an economical solution, which outlines more requirements being adopted by SMEs.

In the second reference, Sheshasaayee and Swetha (2015) present the challenges of business intelligence software combined with cloud computing. The combination of business intelligence with the cloud software has many important advantages. The most important are the speed of construction and speed to services, reduced costs of organization and payment of services depending on the use that is made (Henning & Kemper, 2010). The cloud combined with business intelligence is considered as one of the most modern technologies in the field of information technology and this is the main reason for facing some serious challenges. The main challenges are the introduction of new technologies to the general public, the absence idealized suppliers of specific software systems, lack of control over the cloud services as all activities are done online and the movement of some

compatible models that attempt to replace the actual abilities cloud systems (Henning& Kemper 2010). In combination of these conclude that the cloud software aimed at companies with reduced financial resources, such as SMEs, but is easy to use and functional. The functions that cloud business intelligence offers have been designed specifically for the needs of SMEs.

Conclusions

Through studies and surveys, many researchers have reached the conclusion that SMEs are the largest part of the market and therefore of the economy in most European countries. They are the driving force of the economy as they provide the majority of jobs in the private sector so they worthily compete with larger companies. Main tool in the development and support of competitiveness among SMEs considered being business intelligence. The decision support systems based on computer applications offer tools that businesses can process the data to extract information and to make better business decisions

Many researchers have searched the topic of business intelligence in SMEs as well the benefits and challenges arising from the implementation of BI.

Hidayanto et al. (2011) have shaped and developed a framework with which businesses will know in advance the level of readiness to adopt business intelligence systems, so to avoid unpleasant results.

Tutunea and Rus (2012), made a more commercial research. They aimed at the available business intelligence tools and their capabilities according to the type of business and their needs.

Scholz et al. (2010) found that the main beneficial factors from the application of business intelligence is the improvements in data support, improvements in decision support and economic factors, while as main challenges they face are the errors and failures of software, the complexity of handling the failure of appropriate data and often inadequate data protection.

Nenzhelele and Pellissier (2014) were able to identify in which sections companies applied business intelligence and what challenges are the enterprises facing. Main application areas are the market research department and the independent sector since businesses have no formal and specific organizational structure. The challenges identified in this study proved to be the lack of resources, lack of time to learn and economic restrains. Decision support systems haven't only benefits but they accompanied with challenges and obstacles.

Frion and Hombrecher (2009) created a new competitive intelligence model to help companies to reach into better decisions by managing a large data volume. The proposed model (Acrie model) consumes a lot of time to install and according to previous studies that have been conducted SMEs don't have the necessary time to deal intensively with the software learning process.

Many researchers have focused to the new technology of cloud computing combined with business intelligence. Agostino et al. (2013) identified the key success factors of adopting business intelligence software in cloud software. Through questionnaires and interviews given by businesses using the similar systems and BI suppliers, they have concluded that continuous data access, ease of use, reduced costs and quick installation time, implementation and responsiveness are the main

features that lead users to purchase similar software. But even this technology faces some challenges. According to Sheshassayee and Swetha (2015), the main challenges of cloud software are the extra costs that may arise from their use, the limited checking services and the non-establishment to the general public.

It is understood that business intelligence is an essential part in the development of SMEs. Choosing the appropriate system from a wide variety of programs and born knowing their weaknesses and challenges they face, businesses will be able to make better business decisions and deservedly compete their competitors. Of course, the results from the use of the systems is not visible from the first application but are perceived gradually. Businesses initially are making slow but steady movements to become familiar with system tools. Then take into account the system outputs that lead to decisions. Finally, once the companies are familiar with the system, all decisions would be taken by it. Once you know the challenges and obstacles that may arise will be in the ready position and is properly prepared to face any obstacle presented to reach a satisfactory result from the application of business intelligence.

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Contingent Valuation Method (CVM) for Agricultural Wastes in the Area of Central Macedonia in Greece.

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Abstract

The present study investigates the tendency of farmers in the greater area of Central Macedonia in Greece, to participate in a program of environmental management. The aim is to determine the amount of Willingness to Pay (WtA) against which the farmers would be willing to allow anyone to gather and carry away the leftovers of their farming exploitation. This is the first step towards the estimation of initial capital for the activation of a collaborative scheme of utilisation of disposable agricultural biomass. The agricultural leftovers are considered as an environmental non-market economic commodity. The evaluation of the value is carried out by means of the Contingent Valuation Method (CVM). By the term Biomass we mean the biodegradable products fraction, wastes and leftovers coming from agricultural, plants and animal substances inclusive, the forestall and the like industrial plant, as well as the biodegradable fraction of industrial wastes and urban effluents and sewage wastes. We conclude that the minimum amount each interviewee is willing to accept as minimal remuneration, is affected by the way these biomass leftovers are managed, the age of the interviewees and the area in which they live. Those interviewees who use such biomass leftovers in alternative applications wish to be remunerated higher compared to those who relinquish such leftovers.

Keywords: Willingness to Accept, WtA, biomass, ordinal model, parametric approach, questionnaire

Introduction

The Contingent Valuation Method (CVM) is a survey-based technique, frequently used in Experimental Economics, especially useful for the valuation of non-market resources/goods/services, and cultural heritage objects (of aesthetic, historic, scientific or social value), such as conservation of monumental remains and preservation of the physical and anthropogenic environment [1-2]. The basic partial techniques used in CVM are (i) willingness to pay (WTP), which is the maximum monetary amount that an individual would pay to obtain/preserve a good, and (ii) willingness to accept (WTA) compensation, which is the minimum monetary amount required to relinquish the good. Therefore, WTP provides a purchase price, relevant for valuing the proposed gain of the good while WTA provides a selling price, relevant for valuing the proposed loss of the good. According to classic economic theory, a significant difference between WTP and WTA should not occur, on condition that there is (i) no transaction cost, (ii) perfect information about goods/services and corresponding prices, (iii) no income effect, (iv) a market that engenders truthful revelation of preferences. Although these conditions were generally met in several economic experiments that used inexpensive market goods with readily available substitutes, the ratios WTA/WTP obtained were significantly greater than unity. This result was attributed to the fact that participants in these experiments lacked market experience [3]. Contingent Valuation Method is the first technique of hypothetical experiments using a questionnaire applied to assess the economic value of public goods

and services and is the predominant assessment technique in the scientific field of Experimental Economics.

The economic value of natural resources is often defined as the value of the goods and the services they offer. The environment economics have developed a series of methods for assessment of the monetary price of the environmental goods and services, which are based on investigation of the public preferences and reflect the practical need of translation of the monetary amount into management policies, in which the public concession and participation in the process of decision making are indispensable.

By the term Biomass we mean the biodegradable products fraction, wastes and leftovers coming from agricultural, plants and animal substances inclusive, the forestall and the like industrial plant, as well as the biodegradable fraction of industrial wastes and urban effluents and sewage wastes.

Implementation

We compare the results of the descriptive statistical analysis among the answers of the interviewees in the mainland Greece (Thessaloniki) and on two Greek islands – Samos and Ikaria. The similarities and differences in the attitude of these two categories of rural population are outlined. We observe that the interviewees in the previous year owned bigger areas of land (more stremmas) per cultivated item on Samos and Ikaria compared to Thessaloniki. Also the interviewees stated that they had almost the same number of stremmas against the average stremmas owned by the farmers in Thessaloniki, on Samos and on Ikaria. Most of the interviewees in Thessaloniki utilize the crop leftovers in other applications but on Samos and on Ikaria they gather it for fuel at home. It is worth noting that management of the rejected biomass does not differ among the above areas.

On the contrary, however, we notice that the minimum compensation amount each interviewee asks in order they may be in a position to gather and carry away the leftovers differs among the areas. More specifically on Samos and on Ikaria the farmers ask for higher remuneration compared to farmers in the Thessaloniki area. However, the willingness shown by the farmers for participation in gathering the crops without any extra remuneration does not differ among the areas.

As regards the income of each interviewee farmer against that of inhabitants in other areas of similar agricultural exploitation it does not differ between the two area categories, as the results show. Additionally we notice that the percentage of the interviewees' income originating in farming is bigger in Thessaloniki compared to that on Ikaria and on Samos. In order we correlate the amount WTA with the rest of the parameters of our example, we apply the model «ordinal regression», given that the dependent variable (WTA) is scaled and the independent variables are discrete (nominal or scaled).

We conclude that the minimum amount each interviewee is willing to accept as minimal remuneration, is affected by the way these biomass leftovers are managed, the age of the interviewees and the area in which they live. Those interviewees who use such biomass leftovers in alternative applications wish to be remunerated higher compared to those who relinquish such leftovers.

The interviewees aged 15 to 25 years wish to be remunerated with smaller amounts compared to those aged 56 up ($p\text{-value}=0,045<0,05$). Further, we notice that the farmers aged 26 to 40 years wish to be remunerated with higher amounts compared to those of 56 years up ($p\text{-value}=0,018<0,05$).

Finally, the interviewees in the Thessaloniki area wish to be remunerated with smaller amounts compared to those on the islands of Samos and Ikaria.

The ordinal logistic mode is listed in a broader category of Generalized Linear Models for arrangement data. The model is based on the assumption that a latent continuous outcome variable exists and that the observed ordinal outcome results from the continuous discreteness of that subjected to j scaled groups.

The specimen of generalized linear models is given here:

$$\text{link}(\gamma_j) = \frac{\theta_j - [\beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k]}{\exp(\tau_1 z_1 + \tau_2 z_2 + \dots + \tau_m z_m)} \quad (1)$$

Where:

γ_j : cumulative possibility for category j

θ_j : threshold of category j

$\beta_1 \dots \beta_k$: reciprocation coefficients

$x_1 \dots x_k$: predictor variables

k : number of predictions

The specimen numerator determines the location of the model while the denominator determines the scale. The terms $\tau_1 \dots \tau_m$ are coefficients for the scale components while the terms $z_1 \dots z_m$ represent the m predictor variables for the scaled components. The scaled components are the cause of differences in the variable of different values of the predictor variables.

The question formulates the Willingness to Accept (WTA) of the interviewee that is their wish for remuneration in order to allow someone to gather and take away the leftovers of the agricultural exploitation. It is impressive that the majority of the interviewees, i.e. 71.7% of the specimen, answered that they would relinquish their farming leftovers without asking for any monetary remuneration. Out of the remaining 28.3% of the specimen, 11.7% answered that they would ask for 1-5 euro to relinquish the farming leftovers in each cultivated stremma on a yearly basis. Similarly another 11.7% of the specimen answered that they would ask for 6-10 euro for the same above reason. Finally, one person in each category (1.67% of the specimen), answered that the remuneration he would ask to relinquish his farming leftovers would be 11 – 15 euro in the first instance, 16 – 20 euro in the second instance and 21 euro up in the last instance.

We observe that in the first category, that is the one of those stating that they do not ask for any remuneration to relinquish their farming leftovers, 58.1% of the specimen would participate without any recompense in the entire process, while 41.8% would not participate without recompense.

In the second category, that is the one of those wishing to collect monetary remuneration to relinquish their farming leftovers, 47% of the specimen answered that they would participate in the relevant procedure, contrary to the 52.9% of the interviewees who stated that they would not participate.

In the first category, i.e. those who stated that they do not wish any remuneration to relinquish their farming leftovers, 58.1% of the specimen would participate in the whole procedure without recompense while 41.8% would not participate without recompense.

In the second category, i.e. those wishing to collect monetary remuneration to relinquish their farming leftovers, 47% of the specimen answered that they would participate in the relevant procedure, but 52.9% of the interviewees stated that they would not participate.

Out of the first category which concerns those not wishing remuneration to relinquish their farming leftovers, 26% of the specimen stated that they abandon their farming leftovers in the field. An equal percentage (26%) states that they burn the leftovers in the field. Only 2.3% gather the leftovers as fuel at home while, finally, the majority that totals 45.2% mention utilization.

Out of the second category, which concerns those wishing remuneration to relinquish their farming leftovers, 26% of the specimen stated that they abandon the leftovers of their farming exploitation in the field.

Out of the first category, i.e. those stating that they do not wish any remuneration to relinquish their farming leftovers, 18.6% of the specimen report an income smaller of the average of the farmers in the area who are involved in similar farming exploitation, 67.4% of the specimen report an income approximately equal to the average and finally only 13.9% of the interviewees report an income bigger than the average in the area.

Out of the second category, that is the one wishing to collect monetary remuneration to relinquish their farming leftovers, 23.5% of the specimen report an income smaller than the average of the farmers in the area with similar farming exploitation, 47% of the specimen report an income approximately equal to that of the average and finally only 29.41% of the interviewee report an income bigger than the average in the area.

$$R^2 = 1 - \frac{\sum_{i=1}^N (y_i - \hat{y}_i)^2}{\sum_{i=1}^N (y_i - \bar{y})^2} \quad (2)$$

Where N is the number of observations, y is the dependent variable, \bar{y} is the mean of the y values, and \hat{y} is the value predicted by the model. R² is the determination coefficient that ranges from 0 to 1. According to the Ephron's R²:

$$R^2 = 1 - \frac{\sum_{i=1}^N (y_i - \hat{\pi}_i)^2}{\sum_{i=1}^N (y_i - \bar{y})^2} \quad (3)$$

where $\hat{\pi}$ = model predicted probabilities, the dependent variable in a logistic regression is not continuous while the predicted value (a probability) is. MacFadden introduced the log likelihood of the intercept model.

$$R^2 = 1 - \frac{\ln \hat{L}(M_{Full})}{\ln \hat{L}(M_{Intercept})} \quad (4)$$

$$2 \ln [L(M_{Intercept}) / L(M_{Full})] \quad (5)$$

Where McFull is the model with predictors, M Intercept is the model without predictors, and \hat{L} is the estimated likelihood. A likelihood falls between 0 and 1, so the log of likelihood is less than, or equal to, zero. If a model has a very low likelihood, then the log of the likelihood will have a larger magnitude than the log of a more likely model. Cox and Snell present the R² as a transformation of the

Statistic that is used to determine the convergence of a logistic regression.

$$R^2 = 1 - \left\{ \frac{L(M_{Intercept})}{L(M_{Full})} \right\}^{\frac{2}{N}} \quad (6)$$

Note that Cox & Snell's pseudo-R² has a maximum value that is not 1; if the full model predicts the outcome perfectly and has a likelihood of 1, and then we have

$$1 - L(M_{Intercept})^{\frac{2}{N}} < 1 \quad (7)$$

Nagelkerke, Cragg and Uhler, adjust Cox & Snell's R² so that the range of possible values extends to 1.

$$R^2 = \frac{1 - \left\{ \frac{L(M_{Intercept})}{L(M_{Full})} \right\}^{\frac{2}{N}}}{1 - L(M_{Intercept})^{\frac{2}{N}}} \quad (8)$$

It should be noted that adjustment of the model is considered good by the coefficient Cox and Snell=0,656 and the coefficient Nagelkerke = 0,683.

Concluding Remarks

External effects are observed when supply or demand impose costs or confer a benefit to others. More specifically, the external effect is the impact of the behaviour of a producer or consumer well-being of another, which is not reflected in market transactions.

The economic evaluation of research aimed at improving overall social welfare. As an initial test for social welfare, the criterion used Pareto, under which a fully competitive market, an action or policy is socially desirable if it improves the position of all the individuals composing the society or at least some (weak criterion Pareto), but difficult position of any other (a strong criterion Pareto). Some benefits from the research are as follows: He offered a variety of options that allow the construction of statistical models capable. The number of interviews and the survey costs are lower compared to those required for investigations manifested preferences. However indicated drawbacks, such as the fact that: there was a bias due to discrepancies between stated intentions and actual behaviour of interviewees.

The specimen response on utilization of the rejected biomass was satisfactory, since a good percentage of the interviewees are willing to contribute to this procedure for a minimal of remuneration, although investigations of this type are novel for Greek reality. From this investigation it is perceived by the society the importance of alternative utilization of the rejected biomass.

It is impressive that the majority of the interviewees, i.e. 43 persons who represent 71.7% of the specimen answered that they would allow their gathering and carrying away of their farming leftovers without asking for any monetary remuneration. Further, encouraging are the results concerning the willingness to participate in the gathering since the majority of the interviewees, i.e. 55% of the specimen, stated that they would participate in the gathering of the leftovers without any remuneration.

With regard to the amount WTA (dependent variable) of the Logit Model we conclude that it is affected by the wish for remuneration (independent variable) at the level of importance 5% (p-value = 0.011). We also conclude that the amount of WTA is affected by the stremmas each farmer owns compared to other farmers at the level of importance 10% (p-value = 0.065). Similarly to Probit Model we conclude that the amount of WTA (dependent variable) is affected by the wish for remuneration at the level of importance 5%.

Since education is a crucial factor that increases WTP medium / long term, future research should be aimed at schools, colleges and universities in the region to increase the value of non-use and to obtain useful information related to awareness of young people. Research using the hypothetical assessment has been used successfully overseas and now recognized as a valid argument. The survey can be a powerful tool in the hands of local and regional authorities for claiming generous funding for the purpose mentioned above.

In conclusion, our analysis shows that social science research can provide useful information about the complex issues of environmental policy, such as biomass management. The analysis of policy for such cases is particularly difficult because these systems provide multiple, interrelated services vary depending on the type of biomass, location and other factors. The work presented here has proved a useful integrated tool for determining the realistic cognitive burden on stakeholders and third parties.

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European Electronic Customs System – The Digital Paperless Future

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Abstract

Purpose – This paper aims to present the genesis and evolution of the European Electronic Customs System, as well as rules for its functioning. And as regards the specific objective, the article attempts to demonstrate the capabilities of the digital paperless European customs union in the context of facilitating trade and at the same time ensuring the security of commercial transactions.

Design/methodology/approach – an analytical and descriptive method has been employed for this study. For the purpose of an analysis, various sources were used, such as domestic and foreign literature, legal acts of the EU secondary legislation in the form of regulations, as well as statistical data of Eurostat.

Findings – The EU customs system, which comprises 28 states, is one of the most modern systems all over the world, including its common legal framework (the common customs code, common customs tariff and other tariff instruments), the common IT platform (electronic customs systems). There are, however, discrepancies in the organisational area that is connected with the very customs services (and information exchange) provided by customs administrations across the Member States. Developing a completely electronic customs system will contribute to eradicating those differences and enable Member States' customs administrations to operate as a single entity, and from the business environment perspective, it will not be relevant where (in which country) customs formalities must be dealt with.

Originality/Value – Attention has been directed to the importance of a digital paperless customs environment for the EU Member States, society and economic operators involved in trade with foreign countries, as well as to a new role of customs – the role that stems from globalisation and new threats to international trade and which aims at ensuring cross-border trade security and introducing new solutions orientated towards more efficient and simpler handling of cross-border trade operations.

Keywords: Electronic Customs System, customs union, Customs administrations, paperless customs environment

JEL classification codes: F140, F150

1. Introduction

A customs system can be considered in a narrow sense and limited to a formal and economic aspect of all those matters which are directly related to customs duties, including also customs procedures. In the above perspective, a customs system encompasses thus a customs tariff and its components, such as, among other things, goods nomenclature, customs rates, calculation elements (other than customs duties tariff instruments, the customs value, origin of goods) and normative acts in the form of the customs law. In a broader sense, however, a customs system includes objectives and measures of a trade policy, which fall under the responsibility of the customs authorities (Naruszewicz, and Laszuk, 2004, p. 38; Czermińska, 2012, p. 54). The system thus includes, above all, activities related to the movement of goods. Nevertheless, contemporary customs systems consist of mechanisms and instruments that go far beyond collecting customs duties and governing international trade with foreign countries. This is because in the course of economic practice, customs systems must tackle new tasks that involve the control of the legality of foreigners' residence and employment, tax surveillance with respect to production and sales of fuel, alcoholic beverages and tobacco products (Mosiej, 2010, p.15.). To meet text length requirements and attain the main objective of this article, the dissertation focuses only on cross-border trade in goods. Hence, a customs system can be perceived merely with respect to actions taken by a state, and in the case of the European Union – actions of the EU and individual Member States, which are aimed at governing trade with foreign countries and are taken according to the customs law (especially the Customs Code and rules for implementing the Code) with customs administrations being involved. The scope of electronic customs system is the same, only the technique and conditions for conducting these operations are different. They take place in an electronic paperless environment and with IT systems being used. In particular, the above allows for electronic data exchange (including customs documents) among customs offices, economic operators and Member States' customs administrations (Czermińska, 2015, p. 268). Computer techniques are increasingly used to support a wide range of Customs operations.

The Electronic Customs (e-Customs) initiative is designed to replace customs procedures that are based on a paper form with electronic operations and to create a more efficient and modern environment for customs administrations of Member States. E-Customs means using digital systems to collect and safeguard Customs duties; to control the flow of goods, animals, personal effects and hazardous items in and out of Member States; and to provide security against crime. In practice, this means providing competent customs authorities with transaction-specific information in an electronic form through electronic customs declarations and entails using digital systems in order to ensure and effect the collection of customs duties, and control the movement of goods to and from the Member

States of the European Union. From an information system perspective, a common information model for electronic trade documents will form the foundation for ensuring technically and semantically interoperable exchange of business documents among different eCustoms applications throughout Europe. The underlying premise in achieving this aim is pan-European interoperability enforcing a common understanding and mutual agreement on a technical, procedural and organisational level between businesses and governments as well as between governmental authorities of the different Member States (Vogel1 at al., 2008).

This article aims to present the possibilities of the digital paperless European customs union in the context of external and internal challenges. The globalisation-related challenges include, among other things: the increasing volume of traffic, new and more complex supply chains, changes in competitive pressure, a rise in crime, including fraud and terrorism, and the expectations of other enforcement agencies for which the customs services carry out tasks. The internal challenges include the inefficiencies and shortcomings arising from differences in implementation by the 28 Member States, with each Member State for example developing its own IT systems, using different working methods and the considerable differences in levels of training, which prevents the Member States from applying European legislation in a uniform manner (European Economic and Social Committee, 2013).

For the purpose of an analysis, various sources were used, such as domestic and foreign literature, legal acts of the EU secondary legislation in the form of regulations, as well as statistical data of Eurostat.

2. The Customs Union as the Foundation of the EU's Electronic Customs System

The Customs Union is a cornerstone and is of key importance for the functioning of the EU's customs system and an essential element in the functioning of the European Single Market. The Single Market can only function properly with a uniform application of common rules at its external borders. This implies that the 28 customs administrations of the EU must act as though they were one. According to a new definition, customs is as an organisation that provides services to the economy of societies through providing services to the trade society and facilitating their works and collecting customs' tariffs and duties and providing the governments with accurate economic information and statistics. Customs is responsible for controlling and validating information from different sources. The more accurate and timely the reception of the information, the better the performance of the customs. Therefore, IT can aid customs to meet these requirements and at the same time maintain previous missions (Salamzadeh, et al., 2015).

The customs union means that:

- there is one customs territory,

- no import or export customs duties can be imposed on the Member States, and the same applies to other levies that have similar effect as customs duties,
- no other instruments of trade policy are allowed in mutual trade,
- uniform customs regulations are applied (among other things, the customs code),
- the common customs tariff is imposed for relations with third countries,
- uniform tariff and non-tariff instruments are used when trading with third countries.

According to Article 28 of the TFEU, the EU comprises a custom union, for which EU has exclusive competence (The Treaty on the Functioning of the European Union). Administering the customs union falls within the competence of the Directorate-General for Taxation and Customs Union (TAXUD) of the European Commission. The customs union management in terms of legislation is within the domain of the Council and the European Parliament, whereas implementing regulations remain the responsibility of Member States (European Commission 2012, p. 11).

The common customs law is applied in the territory of the European Union, which results from the fact that the Member States form one customs territory. The most important legal act, which governs the exchange of goods and which is related to the functioning of the customs union, is the Community Customs Code (CCC) and rules for implementing the Code (Council Regulation (EEC) No. 2913/92). The Community Customs Code was laid down in 1994 and has been amended several times since then. One of the most significant amendments was made in April 2005 and constituted a so-called security amendment to the CCC. The amendment combined three groups of measures aimed at strengthening the security, as follows: it requires traders to provide customs authorities with a summary declaration, which contains information on goods prior to import to or export from the EU; it provides reliable traders with trade facilitation measures — the institution of authorised economic operator and introduce a mechanism for setting uniform risk-selection criteria for controls, supported by computerised systems, which means the equal level of protection during customs control of goods moving across the customs border of the European Union (Regulation (EC) No 648/2005). At the moment, a document that is binding, is the Union Customs Code, which entered into force on the 30 October 2013 (Regulation (EU) No 952/2013). After the 30 October 2013, only some of the UCC rules were applied and the Code entered into force in full on the 1 May 2016. However, all of its rules should become fully operative until the end of 2020. In the transitional period, new rules will apply in combination with existing IT systems, and in some cases, paper forms will be still used. The UCC focuses particularly upon employing information and communication technologies, and in particular, upon setting a legal framework for applying the principle according to which all customs and trade

transactions must be carried out electronically, and information and communication systems should facilitate customs operations conducted in the EU to the same extent in all the Member States.

Customs administrations across the Member States handle approximately 15% of world trade (over 2 billion tonnes of goods a year) with a value of EUR 3.4 trillion (EUR 1.68 trillion for imports and EUR 1.7 trillion for exports). This is more than the total yearly retail sales in the EU (European Commission, 2016). During 2014, almost 278 million customs declarations (an average of 9 customs declarations per second) were handled by more than 2,000 EU customs offices (more than 119,000 officials) working 24 hours a day and 365 days a year. The most goods are imported to/exported from the EU by sea (54% in 2014), whereas cargoes shipped by air account for approx. 19% (European Commission, 2016).

3. Objectives and Evolution of e-Customs

3.1. Genesis and Evolution of the Programme with Respect to EU Regulations

Constantly increasing trade, new and more and more complex supply chains and business models (e.g. e-commerce), as well as new logistics requirements and competitive pressure entail greater pace and a more and more complicated environment for cross-border trade. Until the beginning of the 21st century, cross-border operations were impeded by complicated and burdensome customs procedures which involved enormous amount of printed documents. Therefore the reform of the EU customs law aimed to create a paperless environment for customs.

An EU document which for the first time dealt with the development of modern technologies and an information society was the Bangemann Report, published on the 26 May 1994 (Bangemann Report, 1994). The report became the point of departure for a European concept of information society and contributed to narrowing the IT gap between Europe and the USA (Czermińska, 2016).

After the 9/11 attack, it was necessary to ensure security with respect to cross-border circulation of goods along with facilitating legitimate trade. Even though these objectives seemingly contradict each other, the use of information technology (IT) in combination with modern methods of risk management allows for accomplishing both these objectives. This requires, however, that specific data (in an electronic form), related both to import and export (before goods arrive at a border), be available to customs authorities and other authorities responsible for the security of cross-border trade in goods using a single communication channel.

Creating a paperless environment for customs in the EU Customs Union is a process which takes place in stages (Table 1). What is also noteworthy is the fact that solutions and systems adopted must be implemented in the 28 Member States in a specified period of time.

Table 1: List of Most Important Stages/Actions Related to the Development of e-Customs in EU

Stage/Event	Description
Providing the basis for an electronic customs declaration environment	
1997 – introducing the New Computerized Transit System (NCTS) and risk management tools	NCTS is applied to a common transit procedure, allows for the real-time exchange of information about transit operations by means of electronic messages. It creates the foundation for an electronic customs system for Import (ICS) and Export (ECS), applying the International Road Transport Convention for Transit (NCTS –TIR) – transit control as part of TIR system, is based on NCTS infrastructure
Establishment of EDI (electronic data interchange, a standard for exchanging information between computer systems) Automated Customs Clearance – 2003-2005	
2003 – 1. Council Resolution of 5 December 2003 on creating a simple and paperless environment for customs and trade. 2. Communication from the Commission to the Council, the European Parliament and the European Economic and Social Committee - A simple and paperless environment for Customs and Trade.	A comprehensive vision of modern customs services that communicate with economic operators by electronic means and creating a modern paperless environment for customs and trade.
Phase implementation – 2006-2013	
Security amendments to the Customs Code: Regulation (EC) No. 648/2005 and Implementing Regulation (EC) No. 1875/2006, which in 2011 made it possible to introduce a systematic and automatic risk analysis based on data gathered in an electronic form	Three groups of measures aimed at strengthening the security, as follows: 1. traders required to provide customs authorities with a summary declaration, which contains information on goods prior to import to or export from the EU: pre-arrival/pre-departure; Implementation: 1 July 2009.

<p>before goods crossed a EU customs border.</p>	<ol style="list-style-type: none"> 2. reliable traders provided with trade facilitation measures — the institution of authorised economic operator (AEO concept); Implementation: 1.01. 2008 3. a mechanism for setting uniform risk introduced – selection criteria for controls, supported by computerised systems, which means the equal level of protection during customs control of goods moving across the customs border of the European Union.
<p>2008 – Decision No. 70/2008/EC of the European Parliament and of the Council of 15 January 2008 on a paperless environment for customs and trade. Decision No 624/2007 – Action programme to implement e-Customs</p>	<p>Creating secure, interoperable IT customs systems for data exchange in order to facilitate import and export procedures: which means systems and databases related to the electronic customs initiative, in order of their implementation deadlines (starting from the publication of Decision in the Official Journal of the European Union), inter alia: 1. within three years (until 15 February 2011):</p> <ul style="list-style-type: none"> • interoperable automated customs clearance systems; • an interoperable system of registration for economic operators; • common customs information portals; • a framework for single access points <p>2. within five years (until 15 February 2013):</p> <ul style="list-style-type: none"> • an integrated tariff environment corresponding to Community standards.
<p>Creating a fully electronic, paperless environment for customs, implementation of all systems envisaged in the UCC; the introduction of the service oriented approach in the design of the new IT systems for customs – The Service Oriented Architecture (SOA), and Information Management System – until 2020</p>	

2013 – the Union Customs Code (UCC) – Entry into application of the UCC on 1 May 2016; and End 2020 for implementation of all systems envisaged in the UCC.	It forms a legal basis for pursuing a fully electronic environment for customs.
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Source: own elaboration based on (Namdarian, 2011; MASP Rev. 2016)

At the beginning of 2003, 15 Member States of the EU devised a new customs strategy which aimed mainly to switch over to an electronic, paperless system. Apart from providing a computerised environment, the strategy was designed to reform the customs law and introduce three types of standard customs processes, such as: import, export and suspensive procedures (such as transit). Due to the fact that the Member States applied different IT systems (that is to say, hardware and software), electronic communication required the systems to be unified and standardised (Table 1). In 2003, the European Commission announced an e-Customs initiative to the Member States, which was a part of a broader strategy: e-Government, the latter being a vision of modern customs that are able to communicate with economic operators by electronic means (Communication from the Commission, COM (2003)452). The opinion of the Commission expressed in the above-mentioned Communication was confirmed by the Council Resolution of 5 December 2003 (Council Resolution of 5 December 2003). Innovative e-Customs solutions play an important role in the pan-European e-Government strategy. The underlying premise is interoperability postulating a common understanding of processes, services and the documents that are exchanged between business and government organisations as well as between governmental authorities of different EU member states (Vogel1, 2008).

Since 2003, when the Commission issued the Communication on a simple electronic environment for customs offices and trade, actions orientated towards creating electronic customs administration have been taken (Table 1).

What is of crucial importance for introducing the electronic customs programme is the Decision No. 70/2008/EC of 2008 on a paperless environment for customs and trade. It concerns creating secure, interoperable IT customs systems for exchanging data included in customs declarations, documents attached to customs declarations and certificates, as well as for exchanging other relevant information in order to facilitate import and export procedures. By ‘e-Customs implementation’ we understand the electronic systems which have been put in place by the EU and its Member States within the field of customs (Table 1). This ‘e-Customs environment’ includes trans-European systems developed at an EU level and systems introduced or developed at a national level for the administration of customs processes in a paperless form (European Commission, 2015 a).

Crucially, the e-Customs Decision led to the generation of the electronic customs Multi-Annual Strategic Plan (MASP), a management and planning tool developed in collaboration between the Commission and Member States in order to set the strategic framework and milestones for implementation of the e-Customs initiative (European Commission, 2015a). Apart from supporting the pan-European electronic customs environment, the main objectives of the programme involve: improving co-operation among customs administrations so that they operate as the one entity; developing international co-operation among EU customs administrations and customs authorities of third countries in order to strengthen supply chain security; fostering actions related to communication systems and information exchange. The latest version of the MASP is a document of 10 June 2016 (European Commission, 2016). It refers to a service oriented architecture (SOA), this is a service oriented a multi-layer distributed IT architecture, which evolves existing approaches of designing distributed application systems such as Client/Server or component oriented paradigms. By implementing the SOA, the aim is to use a common design pattern associated with proven technologies. There are many examples of successfully implemented SOA systems ranging from IT systems of international companies on the private sector, for example: IT systems for airline companies - Lufthansa, United airlines and Delta airlines (for reservations, inventory and passenger check-in); e-government IT systems offering one-stop shop services, such as Denmark's Customs IT system and Greece Customs IT system (MASP Rev. 2016, Annex 5).

The next phase of evolution of IT systems, European Interoperability Strategy systems (EIS), is reflected in a new version of the MASP (Table 1). Future EIS are linked to new developments in several customs policy areas, but mainly the in view of the implementation of the UCC (MASP 2016).

3.2. Objectives of the Programme

Facilitating trade and strengthening the security of cross-border trade in goods are among the main goals of the e-Customs initiative. With regard to specific objectives to be attained at a Member State level, the programme is orientated towards (Czermińska, 2016):

- removing paper documents,
- enhancing the competitiveness of economic operators by lowering costs connected with customs procedures (simplified procedures for reliable economic operators),
- simplifying customs formalities, and thus expediting the movement of goods, more effective control and customs supervision (risk analysis, security).

Four principal objectives of the e-Customs programme can be mentioned. First objective is to ensure a customs administration service that does not require visits to a customs house by using electronic data between declarers and the customs. Second, to create a network of interconnections and ensure information exchange among different entities involved in the international supply chain

(manufacturers, exporters, transportation and shipping companies, customs warehouses, customs brokers, customs authorities of the Member States) and to enable them to exchange information/data in order to expedite the movement of goods. Third objective is to simplify and enhance the efficiency of customs procedures in a computerised customs environment by handling customs declarations automatically, which translates into faster customs clearance without increasing the number of customs offices or officers; this is extremely important with respect to an increased volume of trade in goods. And finally, when considering the fourth objective, customs authorities may use e-declarations to make the control process more efficient, as well as to eliminate erroneous customs declarations or conduct ex ante risk analyses and select goods for control determining a place and scope of such control.

Whether these objectives will be accomplished or not is conditional upon using information and communication technologies for customs purposes. The Commission and Member States have undertaken to develop and operate secure, integrated, interoperable electronic systems that enable the exchange of customs declarations, electronic certificates, accompanying documents and other information in order to facilitate the movement of goods on and outside the territory of the European Union, as well as to minimise the differences among customs services provided by customs administrations of the Member States. A precondition for this is applying EU regulations in a uniform manner and treating economic operators in a similar way, which means that the efficient functioning of the Single Market must be ensured. And consequently, this would imply that in practice, customs administrations of the Member States would function as a single entity. The Member States used to adopt various solutions and approaches to customs services, and companies operating in different Member States had to meet different conditions of accessing electronic systems. The differences among existing systems, sets of rules and data used, and consequently, lack of interoperable systems in the Member States rendered the harmonisation of actions impossible. It is thoroughly undesirable for the European Union to lack common requirements for accessing data, and for customs administrations to experience communication differences, as this could pose a threat to efficient functioning of the internal market. Hence it was necessary to create community applications for customs clearance, using the computerised transit system (NCTS) as a model, which, consequently, required setting a framework for convergence, and also, common standards and structures, wherever required (Commission of the European Community, 2005). As a result, more than 20 separate IT customs systems were introduced with respect to several areas, and to be more precise – to control of trade, registration of economic operators, risk management and an integrated tariff environment (Table 2).

Table 2: The Most Important IT Systems Launched Under e-Customs

Area	Name of system	Description/application
Handling and control of trade in goods (import, export and transit)	The movement systems: ECS, ICS, NCTS; supported by the most important applications/components: <i>SPEED, SSTA, CS/RD, CS/MIS, STTA, TTA</i>	ECS – the Export Control System; ICS – the Import Control System – allow for handling import and export customs procedures, exchanging messages among economic operators and customs offices and at an EU level; NCTS – New Computerised Transit System, designed to handle a common transit procedure on the territories of the EU, EFTA and Turkey, enables the real-time exchange of information on transit operations by means of electronic messages; the following applications/components are supporting these systems: the system to exchange data with third countries (SPEED bridge), the Standard SPEED Test Application (SSTA), the Standard Transit Test Application (STTA), the Transit Test Application (TTA), the Central Services/Reference Data (CS/RD) and the Central Services/Management Information System (CS/MIS).
Registration and management of economic operators	EOS (EORI, AEO), RSS	EOS – Economic Operators System, which includes: EORI – Economic Operator Registration and Identification, as well as AEO – the System for Authorised Economic Operators, RSS – Regular Shipping Service and the mutual recognition with partner countries functional domains.
Analysis and management of risk	CRMS	CRMS – Customs Risk Management System (covering the Risk Information Forms – RIF), which is based on common risk criteria and standards in the EU, allows for quick and secure

		exchange of information on risk among all customs control points in the EU.
Guarantees	GUM	GUM –Guarantee Management – handling all types of guarantees, with the option to inform an economic operator about a status of guarantee, amount of debt and payment due dates
Customs tariff and other instruments of trade policy	Integrated Tariff Environment – ITE, a family of semi-centralised IT systems: CN, TARIC, EBTI, ECICS, QUOTA, Suspensions, Surveillance	<p>The tariff system (TARIC) which is a reference data system for other applications such as:</p> <p>1.Quota Management System (QUOTA – a central database (managed by DG TAXUD) containing tariff quotas (limited quantities for a number of products for which the import customs duty is reduced), 2. The surveillance management and monitoring system: Surveillance – a central database (managed by DG TAXUD) providing statistics for all products imported into the EU customs territory and for certain products exported from the EU customs territory, 3. The European Binding Tariff Information system (EBTI), 4. The European Customs Inventory of Chemical Substances (ECICS).</p> <p>The Combined Nomenclature (CN) and the suspensions (Suspensions) applications are managing legal information with a direct link to the tariff system.</p>
Exchange of customs-specific information	SMS, DDS	SMS – The Specimen Management System; DDS – Data Dissemination System – which manages any information accessible to society

Source: own elaboration based on (Regulation (EU) No 1294/2013)

According to the Decision No. 70/2008/EC of 2008, two groups of systems can be mentioned (Article 4). The first group comprises systems which have been introduced on the basis of the Customs Code, such as (Section 1 of the Decision, Table 2):

- systems for import and export interoperating with the system for transit (ECS, ICS, NCTS),
- a system of identification and registration for economic operators (EORI) interoperating with the authorised economic operators system (AEO),
- a system for the authorisation procedure, including the information and consultation process, the management of certificates for authorised economic operators and the registration of them.

The other group includes, among other things:

- common customs portals, enabling economic operators to access information necessary for dealing with customs formalities, establish and make operational the common customs portals, which were scheduled to be launched in the Member States until 15 February 2011,
- integrated tariff system (TARIC, QUOTA, EBTI, ECICS, Suspensions, Surveillance), introduced in the Member States in collaboration with the European Commission until 15 February 2013 (Article 4, Section 3),
- common specifications related to: 1. a model of single access points (Single Electronic Access Point - SEAP) which make it possible to submit an electronic customs declaration through an interface (connected to customs systems of all the Member States) in any Member State, even if a customs procedure is dealt with in a different Member State; only one SEAP is required for economic operators to submit a declaration, irrespective of a Member State of final destination; 2. electronic interfaces for economic operators, to allow them to pursue matters pertaining to cross-border trade with customs authorities of the country where they are based, including matters involving several Member States. The Member States are obliged to create and introduce single access points and electronic interfaces within the period of three years as from a positive assessment of the common functional specifications (Article 4, Section 5).

4. The Digital Paperless Future – Benefits

Creating a paperless customs environment may pose the greatest challenge to the functioning of the customs union, which consequently, makes it necessary to implement interoperable IT systems in the entire EU. Those systems not only contribute to expediting customs clearance, but also allow for the exchange of customs information, documents (customs declarations, applications, decisions) among all parties and services engaged in international exchange, facilitate combating customs crime and terrorism, ensure stricter security against an inflow of goods that do not conform to EU standards and pose a threat to human safety, health or life. Developing a completely electronic customs system will enable Member States' customs administrations to operate as a single entity, and from the business environment perspective, it will not be relevant where (in which country) customs

formalities must be dealt with. Creating a paperless, electronic environment for customs means a series of benefits both to the functioning of the very customs union, the Member States, society and economic operators (Table 3).

Table 3: Benefits of Introducing e-Customs to Stakeholders

Government (the EU and national), customs authorities	Society/consumers	Economic operators
<p>Lower Customs Risk (Data integrity, availability of real-time information, facilitate customs), the exchange of results of checks and risk analyses between Customs administrations, improve visibility of supply chain, shipment tracking.</p> <p>Improved protection of the financial interests of the EU and its Member States. Ensuring due collection of customs duties and other import levies (VAT, excise).</p>	<p>Co-ordination of a common approach to control of goods and effective risk analysis allow for: intercepting dangerous and illicit goods; better protecting the society, for example against counterfeit goods, the public health from substances dangerous to health (e.g. dioxin, drugs) but also to ensure the protection of the environment and of endangered species; ensuring protection against an inflow of goods that do not conform to EU standards.</p> <p>Improving the safety and security of citizens with regard to dangerous and illicit goods</p>	<p>Better customs services, improving the quality and effectiveness of customs services; possibility for handling customs formalities in any place in the European Union, a Single Window makes it possible to integrate data for many services (for the purpose of cross-border movement of goods in the EU, it enables economic operators to submit all information in an electronic form and on a one-off basis). Control and facilitate the movements of goods through efficient import and export procedures, facilitate legitimate trade</p>
<p>Faster Clearance Cycle (Automated receipt and processing of declarations, increasing data transfer speed and quick communications)</p>		<p>Faster Clearance Cycle (automated extraction of data), and consequently – expediting cross-border trade in goods</p>

Lower Transaction Costs (Eliminate non-value added processes, e.g. reduced compliance and administrative costs related to clerical tasks, use of forms/paper, reduction compliance and administrative costs, information exchange (communication) via internet and electronic systems, ensuring uninterrupted flow of information among countries, in a manner which makes it possible to retrieve data entered into the system.		Lower Transaction Costs and increase the competitiveness of European trade (eliminate non-value added processes – reduces delays on preparation, submission and processing of documents, reduced costs of paper, forms, eliminate data errors and reprocessing of documents), streamlining procedures and formalities applicable to cross-border trade)
Facilitate Documentary Compliance (e-Document Standards – electronic documents, electronic archiving, data security and integrity – server certificate, electronic signature, encryption).		Facilitate Documentary Compliance (e-Document Standards, data security and integrity – server certificate, digital signature, encryption).

Source: own elaboration based on (Wong, 2006)

Among major benefits arising from introducing e-Customs, one may mention the following ones:

- shortening time required to deal with customs clearance formalities, and consequently – expediting cross-border trade, reducing costs and enhancing competitiveness of companies, improving quality and effectiveness of customs services;
- the possibility of handling customs formalities in any place all over the European Union;
- facilitation for and occasional checks of reliable economic operators (AEO);

- easier access to information;
- making administrative procedures more transparent and uniform;

Wong (2006) suggested that e-Customs can decrease the time of administrative functions from 20 minutes to 2 minutes on average through increasing capabilities and increased use of Internet infrastructures and utilising ERP concepts (enterprise resource planning), which means that all departments and functions in a company are integrated and a common database within one system is created, consequently, a company uses only one data set (Wong, 2006).

The implementation of e-customs requires the provision of software, systemic, and human force infrastructures (Salamzadeh et al., 2015). The cost which economic operators have to bear includes expenditure on technical infrastructure and adaptation of their IT systems to systems used by customs administrations.

Nearly all export and import customs declarations throughout the EU are currently filed in an electronic form (more than 98%). 84% of all import customs declarations are handled within one hour (the time from submitting a declaration to the moment when goods are permitted in trade), out of which 71% are dealt with in less than 5 minutes, with only 2% requiring more than 48 hours (European Commission, 2016).

5. Conclusions

This work presented evolution, objectives, rules of functioning and benefits of e-Customs. Globalisation and liberalisation of trade, a considerable increase in the volume of trade and the development of e-commerce, as well as extensive use of IT pose new challenges for customs authorities of the Member States. E-Customs, which has already been in implementation phase in the European Union for more than 10 years, rises to these challenges being the biggest undertaking in respect of cross-border trade. It is a part of a broader project that encompasses e-administration and e-Europe. The e-Customs initiative includes a number of IT projects, organisational and legal measures. They are designed to create a simple and paperless environment for trade and customs, to make the duration of customs clearance shorter and to ensure an appropriate level of security of commercial transactions. Their goal is mainly to facilitate customs processes for the movement of goods into and out of the European Union and to reduce all risks, such as the threats to the safety and security of citizens and the financial risks. An electronic environment for customs and trade, consisting of accessible and interoperable customs systems, will allow for faster release of goods. Furthermore, economic operators will, under certain conditions, be able to conduct their customs-related business with the customs administration at the place where they are established (centralised customs clearance and single access point).

The electronic customs systems of the Community and the Member States shall provide for the exchange of data between the customs administrations of the Member States and economic operators; the customs authorities of other Member States; the Commission; other administrations or agencies involved in the international movement of goods, and other administrations or agencies.

The e-Customs system, which is being implemented in the European Union, has contributed to the reduction of administrative cost and led to the more harmonised exchange of information among customs authorities and economic operators in the Member States. Due to time saved and cost reduction arising from removing printed form of documents, economic operators can rely on the more efficient handling of customs declarations. However, some supplementary documents (such as air waybills, commercial contracts and invoices), are still required in a paper form, which makes those benefits less powerful. Furthermore, not all the Member States have fully implemented a paperless environment for customs, there is a situation of ‘paper-less’ customs, rather than paper free (European Commission 2015a). At this stage of implementing the programme, the transfer of data among customs authorities and economic operators has improved, however, this does not mean that a completely uninterrupted flow of information has been already ensured. Economic operators must sometimes provide the same data several times in a Member State in which they operate and – if they conduct business activities also in other Member States – they are obliged to submit such data in every individual State. This is definitely an area which can be improved in the future. The development of an e-Customs environment has helped Member States’ customs administrations to perform their key tasks more effectively and efficiently. Processes are carried out faster, more efficiently, and with less scope for human error.

The full implementation of the electronic customs programme constitutes the greatest challenge for the customs union, and all the Member States are involved in this undertaking. Only close co-operation among them, particularly among customs administrations and the harmonisation of their operations, will contribute to providing the best conditions for the functioning of European companies. Today, a digital paperless European electronic customs system sounds like a dream, but it is no dream anymore, it is the soon upcoming reality.

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Financial and fiscal crises, prices and EUR/USD rate of exchange

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Abstract

The main aim of this paper is to answer the following question:

How did the standard and non-standard ECB policy measures influence the price level and EUR/USD rate of exchange in the period 2008-2013?

We formulated the following hypothesis: Depreciation of the euro versus American dollar exchange rate occurred in the period of financial and fiscal crisis (2008-2014). The main reasons for that included: fiscal crisis in the euro area, implementation of standard and non – standard (quantitative easing) ECB monetary policy measures and growth of money supply in the euro area. In that period the economically and statistically significant impacts of money supply aggregate M2 and differences between interest rates and rates of inflation in the euro area and USA on changes in EUR/USD rate of exchange were noted.

For verification of our hypothesis we used econometric modeling - models of regression estimated using the OLS, Cochrane-Orcutt LS and GARCH (0.1). In the research we have used the monthly data for the period 1999:01-2013:12. Results of our research confirmed the hypothesis formulated by us.

Key words: financial crisis, fiscal crisis, rate of exchange, econometric model, VAR

JEL classification codes: C58, E31, E32, E40, E52, F31, G01.

Introduction

The financial and fiscal crisis in the euro area has had a crucial impact on prices and the EUR/USD exchange rate. The aim of the research which has become the basis for this paper was examining *how the standard and non-standard ECB policy measures affected the price level and EUR/USD rate of exchange in the period 2008-2013?*

Monetary policy of the European Central Bank had a considerable impact on changes in the M2 money supply aggregate and interest rates. Those factors together with the FED monetary policy effects and differences in inflation rates in the euro area and USA influenced the EUR/USD rates of exchange. Hence the following hypothesis has been formulated in our research: Depreciation of the euro/USD exchange range occurred in the period of financial and fiscal crisis (2008-2014). The main

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reasons for that included: fiscal crisis in the euro area, implementation of standard and non-standard (quantitative easing) ECB monetary policy measures and growth of money supply in the euro area. That period was also characterized by: the economically and statistically significant impacts of the money supply aggregate M2 and differences between interest rates and rates of inflation in the euro area and USA on changes in EUR/USD rate of exchange.

For verification of the above hypothesis we have used econometric modeling - models of regression estimated with the use of OLS, Cochrane-Orcutt LS and GARCH (0.1). In the research we have used the monthly data for the period 1999:01-2013:12.

1. Financial and fiscal crisis in the euro area

Global recession started in 2008 but already at the end of November and the beginning of December 2007 the top turning point of the business cycle was noted in American economy. It was accompanied by an equally deep financial crisis.

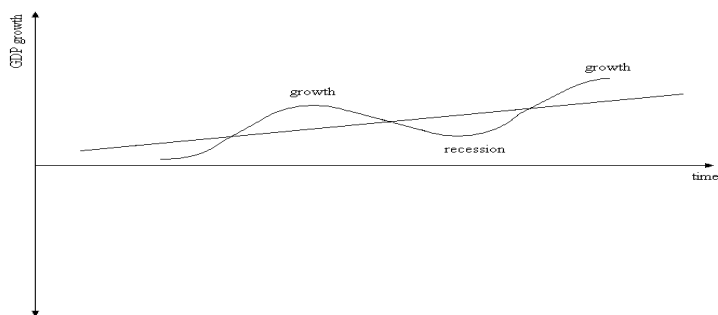
Business cycle, economic expansion and recession are natural phenomena in market economy, as natural as high and low tides, or the phases of the moon. Recession is a natural mechanism of clearing the economy of inefficient economic units and a mechanism of restoring economic equilibrium after the economic growth induced turbulence.

In the upward phase of the business cycle (economic boom and growth) we deal with a self-stimulation mechanism whose components include: alleviation of financial restrictions, increase in asset prices, currency appreciation as well as growth of economic efficiency at the micro-economic level and growth of the profit rate. These processes are usually accompanied by a growing inflation rate.

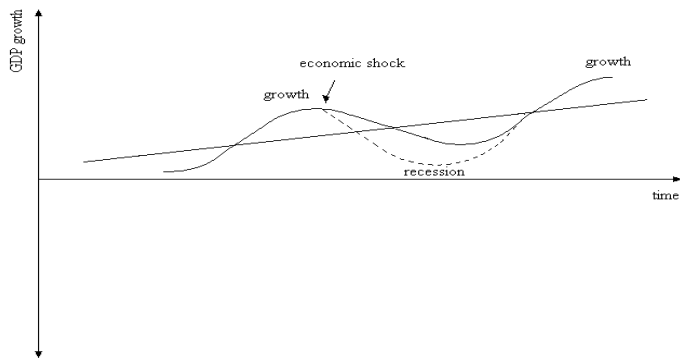
In the downward phase, a fall in production, employment and economic efficiency is observed as well as losses at the microeconomic level, lower asset prices and currency depreciation. These types of changes are a natural component of the business cycle. However, in some cases the above changes can become stronger, which is unnatural in comparison to the regular course of the cycle (see: Barczyk, et. al., 2006: 15–14). These cases may concern the occurrence of economic shocks, demand- or supply-side ones, monetary and currency related ones, fiscal ones, etc.

Economic shocks are understood as unpredictable economic and/or political events, either stimulating economic growth (favourable ones), or causing recession. They can lead to a boom in economy which occurs earlier than it could be expected from a regular, predictable course of the cycle, a rapid and earlier slump and recession, a higher economic growth rate and longer lasting upward phase, or a deeper and longer recession (see: Fig. 1)

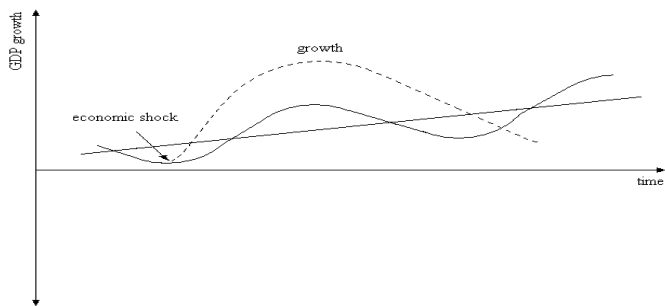
A. Regular course of the cycle



B. Economic shock accelerating recession



C. Economic shock accelerating and stimulating economic growth



D. Economic shock deepening recession

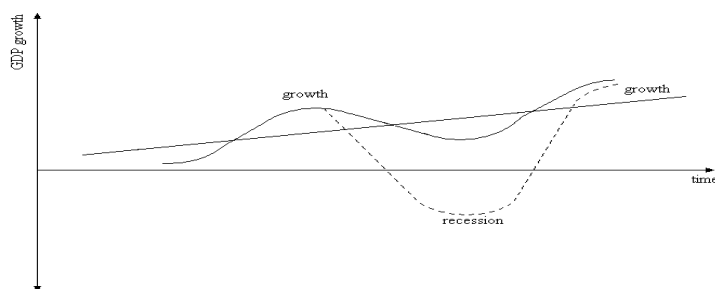


Fig. 1. Business cycle and impact of economic shocks

Source: author's own compilation

Shocks of financial nature in the situation when the financial system of economy is liberalized and adjusts easily to the fluctuations in economic activity are particular cases. In such circumstances a tendency to take risks in pursuit of higher return rates on capital is an important factor stimulating changes in economy.

1.1 Financial crisis

Financial shocks are a subject of many theoretical concepts. H.P. Minsky formulated the financial instability hypothesis. According to this concept market economy is a financial system, which in essence consists in transforming current money into future money. Current money serves the aim of financing a purchase of production factors. Future money consists of profits ascribed to capital assets. The process of financing investments leads to a situation in which control over capital assets is related to liabilities. The financial situation of every economic entity is determined by its liabilities written down in the balance sheet as well as predicted revenues (Minsky 1992, p. 2).

H.P. Minsky pointed to the increasing fragility of the financial system before the top point of the cycle. He also argued that in market economy the period of growth is followed by the emergence of financial structures susceptible to deflation, a decline in the value of assets and deep depression (see: Minsky 1992, p. 6). The problem, however, is rooted in the fact that the amount and structure of liability repayments are explicitly determined, whereas revenues are subject to business cycle fluctuations.

H.P. Minsky points also to two price-setting mechanisms. The first of them is the product and labour market mechanism. The regular price-setting processes occur here. Prices cover current costs of enterprises, are the source of profits, household incomes and state revenues obtained via the tax

system. The second mechanism – the market of capital assets – consists in the fact that prices are determined not by a current but future value of anticipated profits.

A prerequisite of the undisturbed functioning of economy is an efficient flow of money along the line: depositors – banks – companies, and back.

The financial system stimulates consumer and investment demand leading to full employment and a high growth rate, but these processes are accompanied by a deteriorating structure of financing. Besides, safe financing which is observed when cash inflows from companies' operations permanently exceeding operational expenditure gradually give place to speculative financing and a Ponzi scheme. The essence of speculative financing is capability of settling all liabilities before the date of crediting elapses. Difficulties occurring in the repayment of liabilities usually do not pose a problem if creditors are understanding and agree to extend the repayment period. The Ponzi scheme consists in repayment of previous debts by new debts. In this case limiting the inflow of financial resources entails bankruptcies of companies (see: Bukowski 2009).

Fragility of the financial system is also revealed by the fact that seemingly small disturbances can lead to a sudden economic collapse.

An expansive economic (fiscal and monetary) policy can be a factor strengthening negative tendencies and leading to speculative bubbles, especially in the real estate market. On the other hand, a stricter monetary policy leading to bursting of the speculative bubble usually causes an immediate collapse of the business cycle. Allegedly, this, among others, may have been the case in the American economy when the FED raised interest rates in the years 2004–2006.

It must be emphasized that the financial crisis which grows together with recession is made more severe by such phenomena as: development of financial engineering, or lack of ownership supervision over the return on capital to risk ratio.

F. Mishkin draws attention to the significance of information asymmetry in the financial market and its consequences in the form of adverse selection and moral hazard. He defines the financial crisis as a financial market disturbance consisting in the fact that adverse selection and moral hazard are becoming such strong phenomena that financial markets are no longer efficient channels of investment financing. Consequently, the financial crisis causes that economy departs from the state of equilibrium with high output and heads for rapid recession (Mishkin 1991, pp. 10–14).

It seems that the above mentioned concepts describe mechanisms of the impact of financial system disturbances on the course of the business cycle fairly well. It must also be emphasized that an adverse role in the financial market disturbances is also played by the state if it keeps up appearances or creates real opportunities making managers feel that budgetary restrictions imposed on their companies are less strict. It happens so if in the past the government offered financial support

to financial enterprises and institutions which were in trouble. Another case is the government's policy which reinforces the conviction that on account of a particular significance of the financial sector enterprises and institutions for economy, in order to maintain employment, the government will not let them go bankrupt (they are "too big to be allowed to fail"). Such a situation actually encourages managers to make risky decisions in pursuit of high rates of return on capital. Achieving high rates of return at a price of high risk is, in turn, profitable for managers owing to the system of corporate rewards and bonuses (Bukowski 2009).

Recapitulating, recession appeared in the years 2007–2012, because this was a natural consequence of the business cycle logic. Yet, its severity was determined by a large scale of the financial crisis. The causes of that crisis should be looked for in the nature of the system and financial mechanism in the market economy. Still, its severity results from the following:

- expansive monetary policy of the US government,
- exacerbation of monetary policy by raising the FED interest rates on federal funds in the period from July 2004 to July 2006 in the USA,
- development of financial engineering and its large-scale usage (ABS, CDO, etc.) at poor risk assessment accomplished by rating agencies,
- creation by the state of an impression of less strict budget limitations for companies and related to this higher expectations of companies,
- detachment of corporate management from the ownership supervision and related to this pursuit of high return rates at a price of high risk. (Bukowski 2009).

The occurrence of another recession in the 21st century between 2007 and 2012 (the first one took place in the period of 2001-2003) was a natural course of events in accordance with the course of the business cycle. Globalization processes and increased economic interdependence on the international scale accelerated transmission of economic disturbances from the USA to other countries of the world, including the European Union. Unfortunately recession was deepened by a financial shock caused by the real estate market collapse in the US and other countries of the world in which the share of the construction industry in the creation of the added value and in employment was particularly high in comparison to other countries (Ireland, Greece, Portugal, Spain). As a result, a collapse in the market of structured securities (CDOs) followed as well as the financial crisis in majority of developed countries manifesting itself in the form of lower financial market capitalization, a decline in financial liquidity, high losses of financial institutions including banks some of which went bankrupt whereas some other faced bankruptcy (see: Bukowski 2011).

1.2 Fiscal crisis

Fiscal problems of the euro area countries resulted from the impact of four groups of factors:

- abandonment of public finance reforms and structural changes enhancing market efficiency as an adjustment mechanism,
- non-compliance with the Stability and Growth Pact imposed regimes,
- high tendency for budget deficits and public debt increase since the very beginning of the euro area existence, especially in Greece, Italy, Portugal and Spain,
- procyclical easing of fiscal policy in many countries in the period of the 2002-2007 boom,
- increase in fixed expenses in total budget expenditure and GDP,
- economic recession in the years 2008-2009 which caused a sharp decline in the economic growth rate and in some countries practically a drop in the absolute value of GDP which resulted in lower budget revenues (see: Table 1),
- end of the boom in the market of assets including, in particular, the real estate market in the USA and other developed countries, which entailed the financial crisis. An adverse impact of this collapse was felt most by the countries characterized by a high share of the construction sector in economy; the crisis resulted also in the financial aid costs for financial institutions, especially in the countries characterized by a weak banking system and poor banks' supervision (e.g. in Ireland),
- implementation of fiscal packages which were to stimulate economic growth.
- relatively low international competitiveness of some economies (Cyprus, Greece, Spain, Portugal, Italy) (Bukowski 2011).

The countries characterized by a large share of fixed expenses in budget expenditure and high budget debt in relation to GDP, using public debt rollover are particularly vulnerable to the public finance crisis and long-term recession. Financial market responses to all kinds of signals concerning the macroeconomic market of the country in connection with the increasing budget deficit and debt are violent. Growing public debt in relation to GDP caused by the growing budget deficit leads to a higher risk of investment in treasury bonds and more difficulties in placing new issues on the market. This means also growing yield of the bonds in the financial market and more difficulties in raising capital for debt servicing and repayment on the maturity date due in a given year. Higher interest rates become necessary to encourage investors to purchase treasury bonds in the situation of higher investment risk and macroeconomic risk of the country. This, in turn, leads to increased public debt and further difficulties in debt repayment, necessity to issue successive treasury bonds and, in the case it turns out impossible to place them on the market – to insolvency (Bukowski 2011).

All this is accompanied by the contagion effect: lower rating for subsequent countries which reveal a high debt and budget deficit to GDP ratio, higher costs of debt servicing and difficulties in placing new issues indispensable to raise capital for debt repayment in the case of more and more countries.

2. European Central Bank monetary policy against financial and fiscal crisis

In the period of the financial and fiscal crises (2008-2013) the Euro versus American dollar exchange rate as well as inflation rates in the euro area fluctuated considerably. Their values were affected by many factors of both economic and non-economic nature.

The financial crisis in Europe was revealed only in mid-September 2008, immediately after a collapse of the Lehman Brothers investment bank in the USA. In the same period the euro area experienced the crisis of confidence and related to it the liquidity crisis in the inter-bank sector which resulted in rapid growth of short-term interest rates in the market. Low activity and high risk occurring in the banking sector caused that financing the real sphere was limited which contributed to a decline in consumption and investment demand. For this reason the European Central Bank undertook activities aiming at restoring equilibrium in the inter-bank market. Initially these were standard activities consisting in using basic monetary policy measures referring mainly to official interest rate developments. In the period from October 2008 to May 2009, the European Central Bank maximally reduced interest rates to the level close to zero which limited any further active use of this instrument. The interest rate policy implemented by the central bank of the euro area did not bring about the expected effects and for this reason the ECB decided to implement non-standard monetary policy measures consisting mainly in modification of classical monetary policy instruments in this phase of the crisis which contributed to a reduction in short-term interest rates in the inter-bank market. Considering the events which took place at the time of the financial crisis and actions undertaken by the European Central Bank at the same time, the financial crisis in the euro area can be divided into several phases where one can distinguish the period of market disturbances, the financial crisis as well as fiscal crisis (Cassola, Durre, Holthausen 2011, p. 281). With reference to particular phases of the crisis one can identify the following non-standard measures used by the monetary authorities of the euro area:

a) phase I – market disturbances

- implementing additional fine-tuning operations,
- increasing liquidity provision at the beginning of the period of maintaining the required cash reserve ratio,

- extending maturity dates of open-market basic and long-term operations,
 - ensuring liquidity in US dollars – TAF (*Term Auction Facility*) programme,
- b) phase II – financial crisis
- conducting re-financing operations in the form of public procurement with full allocation of resources and a fixed interest rate,
 - further modification of maturity dates of long-term re-financing operations,
 - extending the list of assets permissible as a collateral,
 - ensuring liquidity in US dollars and Swiss francs,
 - Covered Bond Purchase Programme (CBPP),
- c) phase 3 –fiscal crisis
- extending the period of conducting re-financing operations in the form of public procurement with full allocation of resources and a fixed interest rate,
 - implementation and further modification of maturity dates of additional long-term re-financing operations,
 - further extending of the list of assets permissible as a collateral,
 - ensuring additional liquidity in US dollars,
 - implementation of the Securities Markets Programme (SMP),
 - resuming the Covered Bond Purchase Programme II (CBPPII),
 - launching the OMT (*Outright Monetary Transactions*) programme of government bond buyout).

All activities, both standard and non-standard, undertaken by the European Central Bank aimed at improvement of liquidity in the inter-bank market which, to some extent, was successful, however it did not manage to completely eliminate disturbances in functioning of the mechanism of the monetary policy impulse transmission. The liquidity crisis in the inter-bank sector caused that financing of the real sphere was still limited.

In the financial crisis period in the years 2008-2009, a dramatic fall in growth of the monetary aggregate M2 occurred as well as a dramatic fall in the inflation rate in the euro-area (see: Figures 1 and 2).

The situation changed considerably in May 2010 when the financial crisis evolved into fiscal crisis. It resulted from the excessive public debt and high deficit in the public sector in some countries of the euro area. Financial problems of the euro area countries resulted, among others, from a lack of

financial discipline in the period of favorable circumstances which preceded the crisis, abandonment of necessary public finance reforms, increase in public debt which was a consequence of high budget deficits as well as non-compliance with the principles of the Stability and Growth Pact¹. The situation deteriorated further due to overlapping of the financial and fiscal crisis. Economic slowdown and limited efficiency of monetary policy implemented by the European Central Bank caused that the euro area countries hugely used active and passive fiscal policies. Implementation of fiscal packages to stabilize the financial system and stimulate the economic situation, increase in fixed expenses in total budget spending as well as reduction in budget revenues being the effect of economic slowdown were additional stimuli having adverse effects on the situation of public finance and increased deficits of some countries in the euro area. Escalation of disturbances resulting from the fiscal crisis in the euro area caused that the European Central Bank decided to use more decisive actions consisting in implementation of non-standard programmes, such as: *Securities Markets Programme*, *Covered Bond Purchase Programme* and *Outright Monetary Transactions*. All these programmes aimed at ensuring long-term liquidity. Additionally, the countries having particularly high budget deficits were covered by the aid programmes of the European Union and International Monetary Fund.

In the period of fiscal crisis which started in mid-2010, dynamics of the monetary aggregate M2 and inflation rate increased in the euro area (see: Figures 1 and 2).

¹ According to the principles of the Stability and Growth Pact, the euro area member states are obliged to prevent excessive state budget deficits and adhere to their levels of 3% GDP. It is the so called budget criterion. Moreover, the member states are also obliged not to exceed the public debt level of 60% of GDP. It is the so called fiscal criterion.

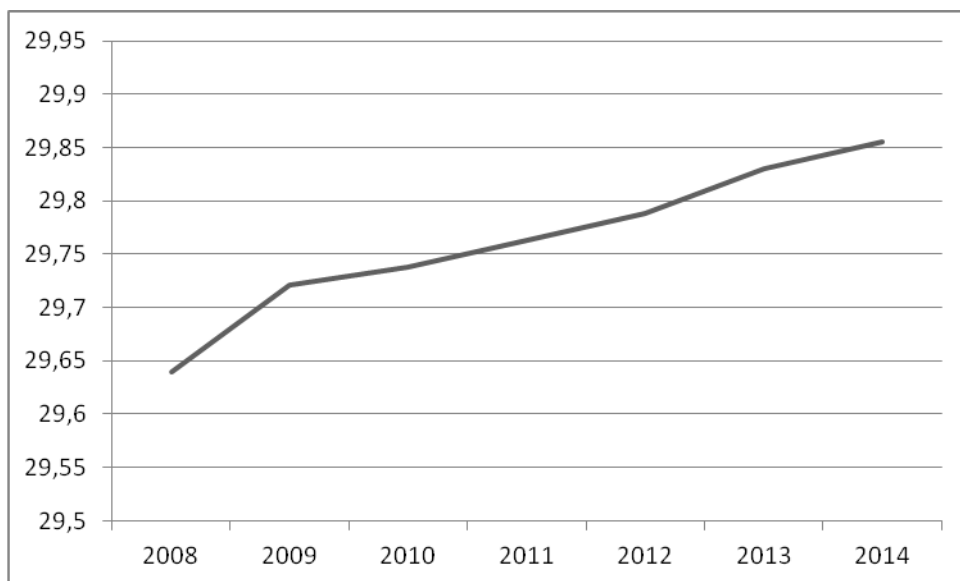


Figure 1. Dynamics of monetary aggregate M2 ($\ln M2$) in the euro area in the period 2008-2014

Source: author's own compilation based on the data from: **ECB Statistical Data Warehouse**,
<http://sdw.ecb.europa.eu/> (access: 7.03.2016)

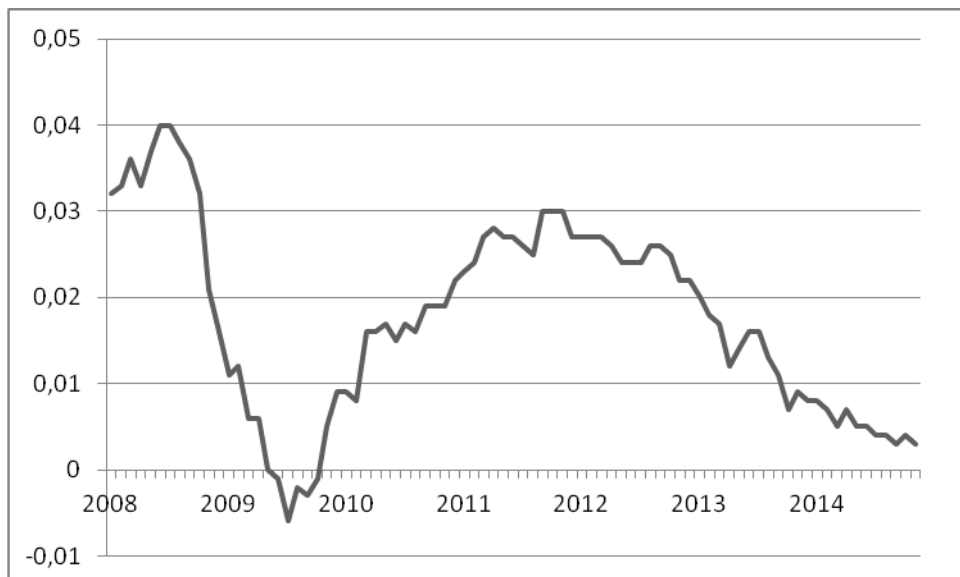


Figure 2. Rate of inflation in the euro area in the period 2008-2014.

Source: author's own compilation based on the data from: **ECB Statistical Data Warehouse**,
<http://sdw.ecb.europa.eu/> (access: 7.03.2016)

Both non-standard monetary policy of the European Central Bank and the fiscal crisis occurring in the euro area had a considerable effect on the EUR/USD rate of exchange. In the period 2008-2013 the euro exchange rate underwent depreciation (see: Fig.3)

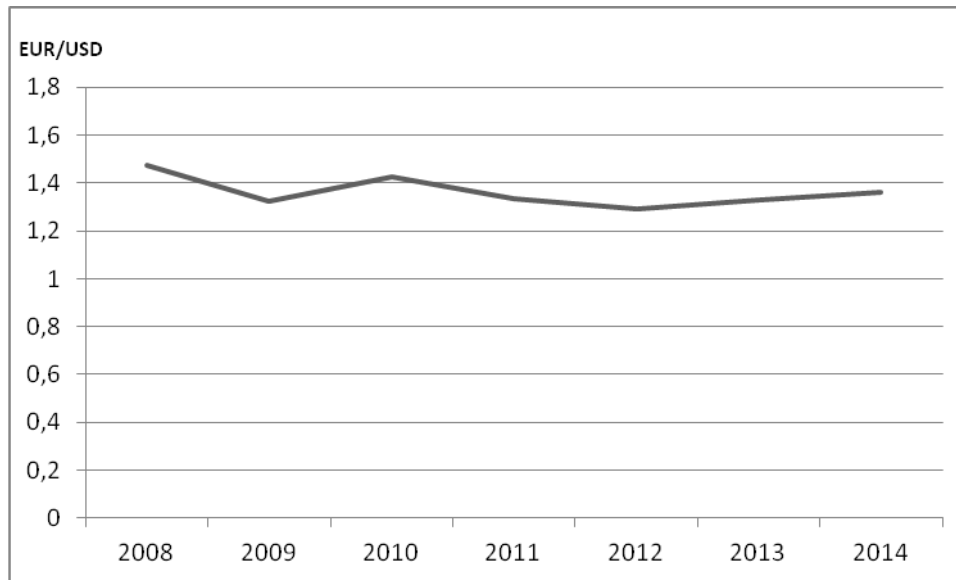


Figure 3. EUR/USD rate of exchange in the period 2008-2014.

Source: author's own compilation based on the data from: **ECB Statistical Data Warehouse**, <http://sdw.ecb.europa.eu/> (access: 7.03.2016)

Other factors which in the period of financial and fiscal crises affected the Euro exchange rate were of non-economic character – they were of psychological nature. High risk and uncertainty which were observed in financial markets in that period caused the capital flight to safe and liquid assets in the currency ensuring relative stability of its purchasing power.

3. Financial and fiscal crisis versus prices and EUR/USD rate of exchange

3.1 Statistical data

In our research we used monthly data from the period 1999-2013. The data regarding the EUR/USD nominal exchange rates, inflation rates in the euro area and monetary aggregate M2 are taken from the *ECB Statistical Data Warehouse*. The data concerning inflation rates in the United States and the monetary aggregate M2 in the USA come from the *Federal Reserve Statistical Releases*. The data referring to short-term, 3-month interest rates in the inter-bank market in the euro area and the United States were taken from the *OECD* database.

3.2 Model

In order to examine whether and how the changes in money supply (monetary policy effect) in the euro area, changes in price levels (inflation rate) and in interest rates in the euro area in relation to these magnitudes in the United States affected the Euro exchange rate (the price of Euro expressed in US dollars) in the period of the financial and fiscal crises (2008-2014), the following model was formulated:

$$\ln E_t = a_{1t} + a_{2t} \ln Me2_{t-1} + a_{3t} \Delta P_t + a_{4t} \Delta P_{t-1} + a_{5t} ie_{t-1} + a_{6t} iu_{t-1} + \varepsilon_t$$

where:

$\ln E$ - logarithm of the USD/EUR nominal exchange rate,

$\ln Me2$ – logarithm of the monetary aggregate M2 in the euro area, Pe, Pu – inflation rates in the euro area and United States, respectively,

ΔP - first differences from the difference in inflation rates in the euro area and United States, where:

$$\Delta P_t = \Delta(Pe_t - Pu_t)$$

$\Delta ie, \Delta iu$ – first differences in short-term interest rates in the euro area and United States, respectively,

a – constant (intercept)

ε – residuals,

t – current period,

$t - 1$ – the period lagged by 1 month,

$t - 2$ – the period lagged by 2 months.

Estimation: GARCH (0.1).

The model was estimated using the GARCH (0.1) method.

3.3 Results

The conducted Engel-Granger co-integration test shows that the examined time series are co-integrated (see: Table 1A).

Table 1. GARCH, using observations 2008:03-2014:11 (T = 81)
Dependent variable: $\ln E$
QML standard errors

	<i>Coefficient</i>	<i>Std. Error</i>	<i>Z</i>	<i>p-value</i>	
const	21.5543	1.35114	15.9527	<0.0001	***
$\ln Me2_1$	-0.713326	0.0454081	-15.7092	<0.0001	***
d_P	-4.4104	0.652543	-6.7588	<0.0001	***

d_P_1	-1.45133	0.632048	-2.2962	0.0217	**
d_ie_1	15.6518	1.10936	14.1089	<0.0001	***
d_iu_1	-6.22052	0.7323	-8.4945	<0.0001	***
alpha(0)	0.000338735	8.6963e-05	3.8952	<0.0001	***
alpha(1)	0.732598	0.169082	4.3328	<0.0001	***
Mean dependent var	0.305427		S.D. dependent var	0.058151	
Log-likelihood	172.3816		Akaike criterion	-326.7633	
Schwarz criterion	-305.2132		Hannan-Quinn	-318.1171	
Unconditional error variance = 0.00126676					

***The variable is statistically significant at the 10% significance level, ** the variable is statistically significant at the 5% significance level, *** the variable is significant at the 1% significance level.**

Source: authors' own calculations with the use of GRETTL program.

Table 1A. Engle-Granger's Co-integration Test. Augmented Dickey-Fuller test with constant and linear trend for uhat including 0 lags of (1-L)uhat (max was 12, criterion AIC) sample size 82

unit-root null hypothesis: $a = 1$
model: $(1-L)y = (a-1)*y(-1) + e$
estimated value of $(a - 1)$: -0.259001
test statistic: $\tau_{ct}(6) = -3.49288$, critical value with significance level 0.05 = -3.45.
p-value 0.6594
1st-order autocorrelation coeff. for e: -0.011

Source: authors' own calculations with the use of GRETTL program.

Analysis of the model estimation results (see: Table 1) shows that all variables are statistically significant and have signs in line with the economic theory.

Concluding remarks

Conducted analysis allows us to formulate the following conclusions:

- The use of standard and non-standard ECB monetary policy measures as a reaction to the financial crisis in the euro area caused a dramatic reduction in interest rates in the inter-bank market and higher money supply expressed, among others, in higher aggregate M2; that was the main reason for the euro versus US dollar depreciation in the period 2008-2014.

- b) there was a statistically significant and fairly strong relationship between short-term interest rates in the euro area and USA which affected the nominal EUR/USD exchange rate in the period 2008-2014,
- c) there was a statistically significant, negative and fairly strong relationship between growing differences in interest rates in the euro area and the United States and the nominal USD/EUR exchange rate in the years 2008-2014,
- d) there was a statistically significant, negative and strong relationship between the money M2 supply in the euro area and the nominal USD/EUR exchange rate in the years 2008-2014,

Thus, recapitulating, the EBC monetary policy, both standard and non-standard, in the years 2008-2014 had a significant effect on the EUR/USD exchange rate, contributing largely to the depreciation of the euro in the same period.

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Foreign Currency Loans and Stability of the Banking System in Poland

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Abstract

The aim of the study was to answer the question whether and to what extent foreign currency loans may pose a threat to the stability of the banking system in Poland. The reason for exploring this problem is the situation in which Swiss franc mortgage loan parties found themselves. The problem concerned not only Poland, but also appeared in Hungary, Spain and Ukraine. The aforementioned countries have adopted various strategies in order to solve this issue. Currently, there is a discussion in Poland over the form of solution to the situation in which the Swiss franc debtors have found themselves.

This article presents the following hypotheses:

The credit policy of banks, which includes mortgage lending in Swiss francs, was a typical action in terms of risk management which in this case was two-way in nature. In addition, banks did not have the opportunity to significantly impose its policies on customers, as evidenced by the degree of market development and market competition.

Conversion of mortgage loans according to the CHF historic exchange rate can affect the stability of the banking system.

The article presents the main types and sources of bank risks with particular emphasis on credit risk and foreign exchange risk. In addition, the paper shows the importance of this kind of risk in the context of the systemic stability of the banking sector in a situation of exchange rate stability disturbances. Verification of the research hypothesis was based on literature studies and analysis of statistical data.

Key words

Banking system, bank risk, foreign exchange risk,

JEL codes; E220, E440, G010, G210, G290, G320, K200,

Introduction

Allocation of resources is the main task of banks in any market economy. It is often wrongly limited to accepting deposits and giving loans. However, to make it fully and effectively implemented, banks also have to make payments and enable the same to other market participants, transform amounts and dates of money flows, collect and process information and provide other market participants with it, take the risk over from other market participants and create instruments serving the purpose of market management and offer them to market participants. Risk is a common phenomenon in bank activities. It is of a complex and multi-dimensional nature. Majority of risk factors derive from information asymmetry. This phenomenon consists in the fact that the scope of information which is in the possession of the parties entering into transaction is varied (B. Pietrzak, Z. Polański, B. Woźniak 2008, p. 21).

The banks which are involved in transactions establish with other market participants relationships at the macro-, mezzo- and microeconomic levels. At the macroeconomic level it is

expected from banks to display behaviours of positive impact on economic growth and strengthening national economy. At the mezzoeconomic level banks should pursue their objectives giving due consideration to maintaining balance and long-term benefits for the region and entities within the area of their activities. Direct relationships with clients form for a bank a plane to meet microeconomic objectives. At this level the bank should aim at gaining profits while simultaneously observing the safety principle.

Ignoring the safety principle may lead to a loss of social confidence in a single bank and, consequently, the occurrence of the domino effect. Due to the significance of this phenomenon, every financial system has financial supervision guarding the safety of banks and other institutions belonging to the system.

Maintaining the safety of bank activities is in the best interest of all markets participants. However, bank clients, in particular depositaries but also borrowers, are very sensitive to the issue of safety because financially weak banks are not able to raise funds which would satisfy demand for loans. It can be said that the proper assessment of risk factors in the financial market determines evaluation of loan funds which are to be the subject of a transaction within the framework of bank activities at the microeconomic level. It determines the costs to be incurred by borrowers, interest rates on depositaries' deposits and profits which will be earned by a bank.

On account of the scale of their activities, banks have an advantage over individual clients in the field of gaining information indispensable for risk assessment as well as its diversification. However, they are not able to affect or fully control its development.

The aim of the study was to answer the question whether and to what extent foreign currency loans may pose a threat to the stability of the banking system in Poland. The reason for exploring this problem is the situation in which Swiss franc mortgage loan parties found themselves. The problem concerns not only Poland, but it also appeared in Hungary, Spain and Ukraine. The aforementioned countries have adopted various strategies in order to solve this issue. Currently, there is a discussion in Poland over the form of solution to the situation in which the Swiss franc debtors have found themselves.

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Stability of the banking system and its significance for economic growth

In source literature the concept of the banking system appears very often, however, the way in which it is defined by particular authors concentrates around the same elements. The differences result from a different approach to the term defined.

In the institutional approach, the banking system can be defined as a collection of institutions which – depending on the adopted model - consists of different types of banks functioning in particular segments of the financial market (Pietrzak, Polański, 1997, p. 39). Alternatively, it can be said that the banking system is an organised set of elements being banks and relationships among them (Milczewska, 1997, p. 7).

Still another way of approaching the problem of defining the place of the banking system in financial markets and the role of banks as financial intermediaries is the functional approach. This approach is represented by a view that development of the banking systems is passive or, in other words, it is an after-effect of the market economy development (Jaworski, 1998, p. 16). In this approach the definition of the banking system comes down to the definition of its role in economy of a given country. *The banking system activity focuses on allocation of resources gained from their depositaries into different kinds of investment in order to multiply them or keep their value* (Kaszubski, 2006, p. 56). In accordance with this approach *the banking system is a network of banking institutions inter-connected by money markets*. In this approach the place and role of the banking system in the financial market structure of a given country depends on the size of money aggregates (Jaworski, 1998, pp. 17-20). Thus, the banking system is a logical and coherent whole created from financial – banking and non-banking - institutions of a given country together with the legal regulations in force.

In the functional approach a very important element is referring by the authors of the definitions to the traditional role of the bank as an intermediary in transformation of savings of some economic entities into investment capital of others. And this financial intermediation between end-creditors and end-borrowers determines the unique role of banks in the market (Merton, 1995, pp. 23-24). An element which distinguishes banks from other financial institutions, such as, insurance societies, pension funds or investment funds, is the fact that banks are the only institutions which create money and organise circulation of money through implementation of inter-bank settlements. This explains their special role in the monetary impulse transmission to economy.

Depending on what in a given market is treated as money, considering all the functions fulfilled by it, it will decide about the number and type of these institutions. Such a way of perceiving the banking system is of dynamic character because it is based on analysis of continuous transformations of elements making up the banking system (Olszewska, 2013, p. 51).

The banking system products are monetary impulses and money flows carried out among different types of economic – financial and non-financial – entities. While analysing the place and role of banks in the financial system one must emphasise the fact that these are banks which in the system fulfil the roles, which non-banking financial institutions are not able to fulfil. These functions include:

- taking the risk over by giving bank guarantees,
- creating and servicing the system of money settlements between business entities,

and the most important element distinguishing banks

- possibility of money creation through accepting deposits and giving loans.

It is owing to the possibility of money creation which determines the volumes of money supply that banks are price-setting institutions in the money market. Additionally, due to its availability to an average customer, regardless of the fact whether it is a natural person or an economic entity, the “banking channels” of the monetary policy impulse flows to economy have the broadest reach.

Therefore, the stability of the banking system is often identified with financial stability. The latter, in turn, constitutes a fundamental condition of every country's economy functioning. It forms a basis of rational decisions about capital allocation supporting effective operating of economic entities (Skrzypek, 2007).

One of the ways of defining financial stability is a negation-based statement, namely that financial stability must be understood as lack of the financial crisis threat, but also a situation in which there is no systemic risk (Lastra, 2006, p. 13). A systemic risk, means, in turn, a situation in which the crisis occurring in one country or region becomes a direct cause of the financial system instability in another country or region. In view of financial market globalisation the crisis often has an international dimension. It happened so on many occasions in the history of the financial market development. An example here can be the crisis in 2007. Turbulences in functioning of financial institutions important for the system is also an example of the systemic risk occurrence which can be accompanied by reduced or no confidence of the financial market participants in its particular institutions. In practice this can mean disintegration of the financial system as a result of a domino effect, external shock or loss of security of economic turnover due to a terrorist attack or organised crime (Solarz, 2008. p. 19).

In a positive approach generally the term "financial stability" defines a situation in which the financial system functions properly, i.e. its functioning is not disturbed in any way. The most important aspects of modern economy include: risk identification and assessment, creating conditions for effective management of the diagnosed risk and effective allocation of financial resources. All these elements lead to financial security (Książepolski, 2004, p. 160). However, the very creating of these conditions does not guarantee that particular market participants achieve expected results of undertaken activities. Thus, financial stability is not synonymous with effectiveness.

Financial crises which have occurred since the 1950s prove that the banking sector, which is a foundation of every country's financial market, is of key importance for financial stability. These are banks which can create money and these are irregularities in their functioning (especially those connected with credit policy) which happen to be the main cause of financial crises, determine their course and social and economic costs. As it is state budget which covers a major part of the financial crisis costs, the state must have at its disposal "the tools" for systemic risk monitoring, valuation and management in the form of the so called financial security network. At the national level, this network consists of the financial market supervision (frequently of integrated nature), the last-instance lender (it is the central bank on which this function is imposed directly by legal regulations) and the deposit insurance system. An obvious consequence of internationalisation of national financial systems is connection of national security networks with one another at the regional or international levels. Despite differences in the division of preventive functions, crisis management functions and management function among particular elements of national security networks, they can create "early warning systems" at the transnational level (Szczepańska, Sotomska-Krzysztofik, Pawliszyn, Pawlikowski, 2004, pp. 6-7). It is particularly important in the situation of the increasing supremacy of the financial system or kind of its breakaway from the real sector of economy. In some circumstances it may mean negative correlation along the line "financial development – economic development" (Krahnen, Schmidt 1994, pp. 9-10). It is possible in the situation when savings of economic entities instead of being a source of financing investment are intended to be used by banks or financial institutions for other purposes, like e.g. speculative operations on an international scale or a necessity to cover costs of non-standard risk. Many economic crises originated in speculative

attacks on currencies of less developed countries. Interventions in the foreign exchange markets mean a loss of reserves and a possibility of refinancing weaker banks. This may result in the financial market destabilisation and necessity of state funding for particular institutions. An additional factor having an adverse effect on economic growth is absorption by the financial system of savings which otherwise could be transformed into investment but serve the purpose of maintaining frequently ineffective infrastructure of the system (Żyrzyński, 2006, p. 546). In the last decades solutions of different types dealing with restructuring processes of banks' credit portfolios, or even the entire banking systems, abounded (Majewska, 2001). Therefore the projects presented by the Polish government aiming at helping these bank clients who took loans in Swiss francs seem to be irrational from the point of view of the role of state in maintaining financial stability.

Bank risk in the current situation in foreign exchange markets

In bank activities risk has always been present, however, together with the development of the banking sector and its environment, the sources and scale of risk to which they were exposed have changed.

Source literature presents several definitions of risk. The main difference is in the very understanding of variability of results. Some authors treat risk as a possibility of changes in a result in relation to the one assumed in the decision-making process. It is a positive risk, which can also be defined as speculative (Gałtarek, Maksymiuk, Krysiak, Witkowski, 2001, p.7). This type of approach to risk is usually applied in financial risk management. Financial risk is connected with the capital structure of the economic entity's balance sheet and it refers to both financial and non-financial entities (Janasz, 2013, p. 174). Among financial entities, financial market institutions are most exposed to this kind of risk (Williams, Smith, Young, 2012, pp. 41-43). We speak about negative risk when a change in a result is one-sided, which means only a possibility of its deterioration. This type of risk is also defined as "pure". In financial markets this type of risk refers mainly to banks and is connected with credit giving activities (Przybylska-Kapuścińska, 2001, pp. 31-33).

Bank risk results from performing different banking operations. Therefore, it cannot be restricted to credit giving activity reserved for banks only. We cannot treat it as a danger leading to deterioration of the financial result and occurrence of other irregularities which may result, for example, in bankruptcy (Rajczyk M., 1997, p. 50). In banking practice there are quite a number of situations which may lead to both profits and losses. Uncertainty about the course of events related to banking activities is a complex problem and it requires a continuous and careful management process (Fedorowicz, 1996, pp. 6-7).

The authors of the bank risk definitions presented in source literature have not reached agreement on the issue whether in banking activities we deal with risk or uncertainty. One of the approaches assumes that risk appears when it is possible to determine a quantitative result of the decisions made (Jajuga, 1996, p. 99 and Stoner, Wankler, 1996, pp. 125-126). However, in the situation where a probability distribution of a specific result occurrence is not known we deal with uncertainty (Knight, 1971, p. 13). A complex nature of the bank risk and the fact that many of its components cannot be measured means that we can assume that banking activities (or broadly speaking, financial activities) are burdened not so much with risk but rather uncertainty.

For the purposes of this paper it was assumed that in their activities banks deal with risk whose multi-factor nature makes it impossible to measure it in its entirety. The factors of bank risk have a double nature. Firstly, they are technical and operational risks; secondly – a set of financial risks. Technical and operational risks result from work organisation, staff competencies or efficiency of IT systems. On the other hand, financial risk consists of: liquidity risk, interest rate risk, credit risk, exchange rate risk, operational risk, transactional risk and strategic and systemic market risks. The latter type of risk can derive from different – above mentioned – causes but it is the scale of effects, sometimes dramatic for market participants, that allows us to define them as systemic ones (Kaufman, 1996, p.23). On many occasions these were market participants who through wrong risk assessment underlying their decision making provoked other entities to undertake specific activities and these, in turn, led to a loss of balance in the market and a change in the value of assets quoted on the market (Danielsson, Zigrand, Shin, 2009, p. 6).

In open economy, majority of financial institutions are international in nature. They conduct their business activities in several or more countries at the same time. Consequently, they are simultaneously exposed to the above mentioned risk factors rooted in different markets and assuming different values. In the situation of disturbed macroeconomic balance and recession resulting from the 2008 financial crisis, it was the foreign exchange risk that turned out to be particularly painful for market participants.

The foreign exchange risk means a possibility of suffering financial losses as a result of foreign exchange fluctuations. In the floating foreign exchange system this risk must be incessantly managed which is not synonymous with risk avoidance. Full foreign exchange risk management consists in using all information and abilities to evaluate it and ensure the expected yield in relation to the size of risk.

In the case of foreign exchange risk limited predictability concerns the value of foreign exchange rates in the future, however, potential losses may appear in the future in two areas:

- exchange rate losses noted,
- lost profits.

In the latter case the loss of profits from exchange rate gains can result from the entity's use of inappropriate in a given market situation, hedging instruments or other factors. It can be, for example, an administrative decision forcing an entity, in this case a bank, to recalculate its currency positions using the exchange rate different from the market one. If we assume that it refers only to the money due to a bank, it can mean not only lost profits but even a loss. Such a solution can be a real threat to the banking system stability. The ability to absorb losses incurred by a single bank, including its bankruptcy, may turn out problematic (Olszewska, 2015, p.125). When this concerns many banks it can be impossible to carry out, especially in the situation of the freedom of deposit outflows from national banks to foreign markets. At present, in open economy, it is possible for the EU citizens without increased transfer costs. The outflow of savings can occur as a result of depositors' reduced confidence in national banking institutions or in order to avoid costs passed on by banks to customers. The second variant is very probable. It is indicated by the solutions adopted in the field of financial supervision in the EU market (Olszewska 2012, pp. 228-229).

Increased prudential regulations and costs related to them are passed on to other institutions creating the system and gradually they assume a transnational character.

Significance of the exchange rate risk for banks in Poland, as exemplified by CHF loans

In the Polish financial market the exchange rate risk plays a significant role. The Polish zloty is not a hard currency free of fluctuations. Despite the fact that after the 2008 financial crisis the GDP growth rate was positive, the zloty exchange rate against key currencies (USD, EURO, GBP or CHF) was strongly depreciated. Most probably speculations in the currency markets were responsible for that. The forecasts based on economic and political factors pointed to stability or even appreciation of the zloty exchange rate. Table 1 presents development of average exchange rates as of the last day of month:

Table 1. Table of the NBP (National Bank of Poland) exchange rates, month end average, for USD, EURO, CHF, GBP in the period 2007-2015

	USD	EURO	CHF	GBP		USD	EURO	CHF	GBP
12-2007	2.4350	3.5820	2.1614	4.8688	11-2011	3.4248	4.5494	3.7112	5.3234
1-2008	2.4438	3.6260	2.2562	4.8593	12-2011	3.4174	4.4168	3.6333	5.2691
2-2008	2.3155	3.5204	2.2083	4.5901	1-2012	3.2032	4.2270	3.5054	5.0496
3-2008	2.2305	3.5258	2.2446	4.4266	2-2012	3.0730	4.1365	3.4318	4.8973
4-2008	2.2267	3.4604	2.1437	4.3822	3-2012	3.1191	4.1616	3.4540	4.9908
5-2008	2.1824	3.3788	2.0767	4.3004	4-2012	3.1509	4.1721	3.4731	5.1295
6-2008	2.1194	3.3542	2.0907	4.2271	5-2012	3.5372	4.3889	3.6545	5.4858
7-2008	2.0509	3.2026	1.9596	4.0637	6-2012	3.3885	4.2613	3.5477	5.2896
8-2008	2.2691	3.3460	2.0723	4.1581	7-2012	3.3508	4.1086	3.4206	5.2567
9-2008	2.3708	3.4083	2.1587	4.2885	8-2012	3.3353	4.1838	3.4839	5.2756
10-2008	2.8472	3.6330	2.4803	4.6092	9-2012	3.1780	4.1138	3.4008	5.1571
11-2008	2.9196	3.7572	2.4273	4.4943	10-2012	3.1806	4.1350	3.4249	5.1265
12-2008	2.9618	4.1724	2.8014	4.2913	11-2012	3.1585	4.1064	3.4088	5.0621
1-2009	3.4561	4.4392	2.9907	4.9311	12-2012	3.0996	4.0882	3.3868	5.0119
2-2009	3.6758	4.6578	3.1355	5.2182	1-2013	3.0874	4.1870	3.3890	4.8885
3-2009	3.5416	4.7013	3.1001	5.0546	2-2013	3.1679	4.1570	3.4072	4.8058
4-2009	3.2859	4.3838	2.9044	4.8926	3-2013	3.2590	4.1774	3.4323	4.9528
5-2009	3.1812	4.4588	2.9438	5.1148	4-2013	3.1721	4.1429	3.3821	4.9148
6-2009	3.1733	4.4696	2.9314	5.2745	5-2013	3.2953	4.2902	3.4569	5.0181
7-2009	2.9525	4.1605	2.7128	4.8832	6-2013	3.3175	4.3292	3.5078	5.0604
8-2009	2.8675	4.0998	2.7037	4.6546	7-2013	3.1929	4.2427	3.4465	4.8577
9-2009	2.8852	4.2226	2.7976	4.6443	8-2013	3.2209	4.2654	3.4632	4.9899
10-2009	2.8595	4.2430	2.8104	4.7228	9-2013	3.1227	4.2163	3.4500	5.0452
11-2009	2.7538	4.1431	2.7476	4.5544	10-2013	3.0507	4.1766	3.3875	4.8872
12-2009	2.8503	4.1082	2.7661	4.5986	11-2013	3.0846	4.1998	3.4084	5.0348
1-2010	2.9083	4.0616	2.7677	4.6971	12-2013	3.0120	4.1472	3.3816	4.9828
2-2010	2.9251	3.9768	2.7169	4.4615	1-2014	3.1288	4.2368	3.4644	5.1458
3-2010	2.8720	3.8622	2.7000	4.3491	2-2014	3.0254	4.1602	3.4211	5.0697
4-2010	2.9305	3.9020	2.7200	4.5042	3-2014	3.0344	4.1713	3.4192	5.0485

5-2010	3.3132	4.0770	2.8661	4.8047	4-2014	3.0440	4.1994	3.4433	5.1181
6-2010	3.3946	4.1458	3.1345	5.0947	5-2014	3.0435	4.1420	3.3924	5.0928
7-2010	3.0731	4.0080	2.9547	4.7997	6-2014	3.0473	4.1609	3.4246	5.1885
8-2010	3.1583	4.0038	3.1012	4.8714	7-2014	3.1094	4.1640	3.4225	5.2506
9-2010	2.9250	3.9870	2.9955	4.6458	8-2014	3.1965	4.2129	3.4930	5.3056
10-2010	2.8873	3.9944	2.9236	4.5950	9-2014	3.2973	4.1755	3.4600	5.3549
11-2010	3.1308	4.0734	3.1359	4.8638	10-2014	3.3459	4.2043	3.4860	5.3503
12-2010	2.9641	3.9603	3.1639	4.5938	11-2014	3.3605	4.1814	3.4788	5.2805
1-2011	2.8845	3.9345	3.0590	4.5769	12-2014	3.5072	4.2623	3.5447	5.4648
2-2011	2.8765	3.9763	3.1043	4.6583	1-2015	3.7204	4.2081	4.0179	5.6089
3-2011	2.8229	4.0119	3.0825	4.5530	2-2015	3.6980	4.1495	3.8919	5.6924
4-2011	2.6501	3.9376	3.0533	4.4215	3-2015	3.8125	4.0890	3.9110	5.6295
5-2011	2.7468	3.9569	3.2254	4.5312	4-2015	3.5987	4.0337	3.8438	5.5622
6-2011	2.7517	3.9866	3.3004	4.4102	5-2015	3.7671	4.1301	3.9910	5.7590
7-2011	2.8109	4.0125	3.5080	4.5768	6-2015	3.7645	4.1944	4.0412	5.9180
8-2011	2.8695	4.1445	3.5373	4.6728	7-2015	3.7929	4.1488	3.9355	5.9045
9-2011	3.2574	4.4112	3.6165	5.0832	8-2015	3.7780	4.2344	3.9238	5.8309
10-2011	3.1024	4.3433	3.5612	4.9683	9-2015	3.7754	4.2386	3.8785	5.7305

Source: Table of month end average exchange rates

<http://www.nbp.pl/home.aspx?c=/ascx/archa.ascx>

In the analysed period CHF was the strongest in relation to the zloty. It was justified by political decisions of the Swiss government and the monetary policy strategy of the Swiss central bank. It was quite a surprise to market participants and resulted in changes in demand for financial instruments, especially loans, denominated in foreign currencies. The demand from households for loans denominated in the Polish zloty and in foreign currencies is presented in Table 2.

Table 2. Growth rate of housing loans year to year

	Zloty housing loans	Foreign currency housing loans	Total		Zloty housing loans	Foreign currency housing loans	Total
12-2007	86.3%	43.0%	58.9%	11-2011	24.2%	2.6%	10.3%
1-2008	80.6%	43.3%	57.1%	12-2011	22.8%	2.2%	9.6%
2-2008	75.5%	44.5%	56.1%	1-2012	22.1%	2.2%	9.4%
3-2008	71.1%	46.0%	55.6%	2-2012	21.6%	2.1%	9.1%
4-2008	62.7%	48.8%	54.2%	3-2012	20.7%	1.6%	8.6%
5-2008	53.7%	50.9%	51.9%	4-2012	19.9%	1.2%	8.0%
6-2008	44.4%	54.1%	49.8%	5-2012	19.3%	0.7%	7.5%
7-2008	35.6%	57.5%	47.8%	6-2012	19.1%	0.0%	7.0%
8-2008	28.1%	60.0%	45.7%	7-2012	18.8%	-0.6%	6.6%
9-2008	22.6%	63.2%	44.9%	8-2012	18.9%	-0.8%	6.6%
10-2008	18.0%	65.8%	44.2%	9-2012	18.2%	-1.5%	6.0%
11-2008	13.7%	63.5%	40.9%	10-2012	18.2%	-2.1%	5.7%
12-2008	12.3%	61.3%	39.1%	11-2012	18.4%	-2.7%	5.4%
1-2009	11.3%	57.5%	36.6%	12-2012	18.2%	-3.3%	5.1%

2-2009	10.8%	53.5%	34.4%	1-2013	18.4%	-3.8%	5.0%
3-2009	8.7%	48.3%	30.5%	2-2013	18.4%	-4.2%	4.8%
4-2009	9.4%	42.4%	27.5%	3-2013	18.0%	-4.4%	4.6%
5-2009	10.7%	36.5%	24.9%	4-2013	17.8%	-4.6%	4.5%
6-2009	12.7%	29.9%	22.1%	5-2013	17.6%	-4.9%	4.3%
7-2009	15.7%	23.2%	19.4%	6-2013	17.1%	-5.0%	4.2%
8-2009	18.4%	17.9%	17.2%	7-2013	17.0%	-5.1%	4.2%
9-2009	21.9%	13.0%	15.4%	8-2013	16.8%	-5.2%	4.2%
10-2009	25.5%	8.7%	13.7%	9-2013	16.9%	-5.3%	4.2%
11-2009	27.1%	6.9%	13.0%	10-2013	16.9%	-5.4%	4.3%
12-2009	28.1%	5.8%	12.5%	11-2013	16.8%	-5.4%	4.3%
1-2010	29.0%	5.3%	12.5%	12-2013	16.9%	-5.5%	4.4%
2-2010	29.7%	4.9%	12.5%	1-2014	16.9%	-5.5%	4.5%
3-2010	30.4%	4.9%	12.7%	2-2014	16.9%	-5.6%	4.6%
4-2010	30.7%	4.9%	13.0%	3-2014	16.8%	-5.7%	4.6%
5-2010	30.9%	5.2%	13.4%	4-2014	16.8%	-5.7%	4.6%
6-2010	31.0%	5.4%	13.7%	5-2014	16.7%	-5.6%	4.7%
7-2010	30.6%	5.7%	13.8%	6-2014	16.6%	-5.7%	4.7%
8-2010	30.5%	5.8%	13.9%	7-2014	16.3%	-5.8%	4.6%
9-2010	29.9%	5.8%	13.8%	8-2014	15.9%	-5.8%	4.5%
10-2010	29.4%	5.8%	13.7%	9-2014	15.5%	-5.9%	4.4%
11-2010	29.3%	5.7%	13.7%	10-2014	14.8%	-5.9%	4.2%
12-2010	29.5%	5.7%	13.8%	11-2014	14.4%	-6.0%	4.0%
1-2011	29.4%	5.4%	13.6%	12-2014	13.9%	-6.2%	3.8%
2-2011	29.1%	5.2%	13.4%	1-2015	13.5%	-6.0%	3.7%
3-2011	29.1%	5.0%	13.3%	2-2015	13.2%	-6.1%	3.6%
4-2011	29.1%	4.8%	13.2%	3-2015	13.2%	-6.1%	3.6%
5-2011	29.0%	4.4%	13.0%	4-2015	12.8%	-6.2%	3.4%
6-2011	28.4%	4.1%	12.6%	5-2015	12.6%	-6.4%	3.2%
7-2011	27.7%	3.8%	12.3%	6-2015	12.4%	-6.4%	3.1%
8-2011	26.6%	3.1%	11.5%	7-2015	12.3%	-6.5%	3.1%
9-2011	26.4%	2.8%	11.2%	8-2015	12.2%	-6.6%	3.0%
10-2011	25.4%	2.6%	10.8%	9-2015	11.8%	-6.6%	2.8%

Source: <http://www.nbp.pl/systemfinansowy/rsf022016.pdf>

Analysis of the data outlined in Tables 1 and 2 shows that households reacted to changes in exchange rates with some delay. This can be accounted for by confidence in domestic currency and conviction about a temporary depreciation of the zloty. An additional factor was the interest rate which was twice lower in the case of loans denominated in zloty than in the case of foreign currency loans.

For the borrowers who were indebted in foreign currencies the depreciation of the zloty means higher costs of debt servicing. The borrowers who took loans in CHF felt them particularly severely. The data concerning changes in the value of CHF loans in relation to wage growth in the enterprise sector and general indebtedness are presented in Table 3. On the basis of the data it can be concluded that the situation of borrowers having loans in CHF deteriorated because of higher

instalment values expressed in PLN, however, their wages also rose in the same period. Our data cover the period from the beginning of 2005 till the end of 2010.

Table 3. Increase in the value of Swiss franc denominated housing loan instalment to instalment at loan origination against values of Swiss franc denominated loans and wage growth in the enterprise sector

	Increase in instalment - fixed principal	Increase in instalment - fixed total repayment	Rise in average salary until September, 2015	Values of loans (right axis)		Increase in instalment - fixed principal	Increase in instalment - fixed total repayment	Rise in average salary until September, 2015	Values of loans (right axis)
1-2005	0.03	0.32	0.70	0.51	1-2008	-0.02	0.24	0.37	3.15
2-2005	0.06	0.36	0.68	0.46	2-2008	-0.03	0.23	0.34	3.58
3-2005	0.05	0.34	0.64	0.64	3-2008	-0.05	0.20	0.29	4.38
4-2005	0.01	0.30	0.64	0.72	4-2008	-0.01	0.25	0.29	5.58
5-2005	0.01	0.28	0.67	0.83	5-2008	0.03	0.29	0.32	5.37
6-2005	0.03	0.32	0.62	1.08	6-2008	0.02	0.29	0.26	6.35
7-2005	0.04	0.32	0.62	1.11	7-2008	0.07	0.34	0.26	6.91
8-2005	0.05	0.33	0.64	1.06	8-2008	0.07	0.34	0.28	5.69
9-2005	0.08	0.37	0.63	1.10	9-2008	0.03	0.28	0.28	5.92
10-2005	0.07	0.36	0.60	1.20	10-2008	-0.10	0.12	0.25	4.83
11-2005	0.04	0.32	0.52	1.23	11-2008	0.00	0.22	0.22	1.82
12-2005	0.06	0.35	0.46	1.42	12-2008	0.06	0.27	0.19	1.32
1-2006	0.07	0.36	0.64	1.32	1-2009	0.03	0.22	0.26	0.73
2-2006	0.08	0.37	0.61	1.23	2-2009	-0.06	0.11	0.27	0.63
3-2006	0.04	0.33	0.55	1.96	3-2009	-0.03	0.13	0.22	0.71
4-2006	0.03	0.31	0.58	1.83	4-2009	0.03	0.20	0.23	0.51
5-2006	0.01	0.29	0.59	2.08	5-2009	0.03	0.19	0.27	0.49
6-2006	-0.03	0.24	0.55	2.32	6-2009	0.00	0.18	0.23	0.43
7-2006	-0.03	0.24	0.53	2.29	7-2009	0.06	0.24	0.21	0.41
8-2006	-0.01	0.27	0.55	2.14	8-2009	0.11	0.29	0.24	0.45
9-2006	-0.04	0.23	0.55	2.04	9-2009	0.10	0.29	0.24	0.99
10-2006	-0.03	0.24	0.53	2.25	10-2009	0.10	0.27	0.23	0.64
11-2006	-0.02	0.26	0.47	2.25	11-2009	0.11	0.28	0.19	0.38
12-2006	-0.02	0.25	0.34	2.77	12-2009	0.11	0.28	0.11	0.53
1-2007	-0.05	0.22	0.52	1.87	1-2010	0.12	0.28	0.26	0.46
2-2007	-0.05	0.21	0.51	1.86	2-2010	0.13	0.29	0.23	0.18
3-2007	-0.06	0.20	0.42	2.34	3-2010	0.15	0.31	0.16	0.25
4-2007	-0.04	0.23	0.46	2.43	4-2010	0.15	0.31	0.19	0.20
5-2007	-0.03	0.24	0.46	2.67	5-2010	0.10	0.25	0.21	0.21
6-2007	-0.05	0.22	0.41	3.08	6-2010	0.06	0.20	0.19	0.23
7-2007	-0.06	0.21	0.40	3.08	7-2010	0.04	0.18	0.18	0.23
8-2007	-0.09	0.17	0.41	2.86	8-2010	0.06	0.20	0.19	0.25
9-2007	-0.08	0.18	0.42	2.52	9-2010	0.04	0.18	0.19	0.03
10-2007	-0.04	0.23	0.38	2.98	10-2010	0.07	0.21	0.18	0.03

11-2007	-0.03	0.23	0.31	2.76	11-2010	0.07	0.21	0.15	0.04
12-2007	-0.01	0.26	0.25	2.84	12-2010	0.02	0.14	0.05	0.03

Source: <http://www.nbp.pl/systemfinansowy/rsf022016.pdf>

Increased costs of debt servicing for households resulted in changes in the share of impaired credits in banks' portfolios in the analysed period 2010-2015. For housing loans which include CHF credits, it (the share) rose by less than 2 percentage points. However, in fact it means a periodic doubling of this value. The data concerning households' impaired credits classified by main categories are collected in Table 4.

Table 4. Impaired loan ratios of main categories of loans for households

	Credit card lending	Other consumer loans	Housing loans	Other	Total		Credit card lending	Other consumer loans	Housing loans	Other	Total
4-2010	15.65%	15.34%	1.57%	6.96%	6.76%	1-2013	16.83%	17.46%	2.84%	10.56%	7.46%
5-2010	16.13%	15.60%	1.60%	6.97%	6.77%	2-2013	16.85%	17.44%	2.87%	10.62%	7.46%
6-2010	16.30%	15.79%	1.59%	7.26%	6.69%	3-2013	16.90%	17.34%	2.90%	10.72%	7.47%
7-2010	16.73%	16.22%	1.67%	7.20%	6.92%	4-2013	16.70%	17.39%	2.93%	10.85%	7.53%
8-2010	17.26%	16.56%	1.72%	7.47%	7.00%	5-2013	16.43%	17.25%	2.94%	10.91%	7.49%
9-2010	17.48%	16.94%	1.79%	7.63%	7.19%	6-2013	15.52%	16.10%	2.95%	10.90%	7.21%
10-2010	17.97%	17.06%	1.81%	7.97%	7.30%	7-2013	15.23%	16.05%	2.97%	10.89%	7.22%
11-2010	18.22%	17.24%	1.82%	7.90%	7.21%	8-2013	15.05%	15.96%	2.96%	10.91%	7.19%
12-2010	18.09%	17.18%	1.85%	8.14%	7.18%	9-2013	14.60%	15.59%	2.95%	10.63%	7.09%
1-2011	18.79%	18.28%	1.92%	8.11%	7.53%	10-2013	14.42%	15.16%	2.96%	10.98%	7.09%
2-2011	19.09%	18.20%	1.97%	8.16%	7.49%	11-2013	14.49%	14.93%	3.13%	11.03%	7.15%
3-2011	19.70%	17.99%	2.00%	8.19%	7.44%	12-2013	13.98%	14.68%	3.14%	10.98%	7.07%
4-2011	18.77%	17.69%	2.02%	8.17%	7.31%	1-2014	14.14%	14.73%	3.16%	10.99%	7.06%
5-2011	18.80%	17.79%	2.05%	8.19%	7.26%	2-2014	14.09%	14.76%	3.16%	10.90%	7.07%
6-2011	18.67%	17.77%	2.07%	8.13%	7.17%	3-2014	14.02%	14.39%	3.11%	10.90%	6.97%
7-2011	19.02%	17.99%	2.10%	8.15%	7.14%	4-2014	13.74%	14.39%	3.19%	10.95%	7.02%
8-2011	19.10%	17.92%	2.15%	8.56%	7.22%	5-2014	13.57%	14.42%	3.18%	11.01%	7.06%
9-2011	19.23%	18.21%	2.22%	9.13%	7.34%	6-2014	13.16%	14.20%	3.16%	11.01%	6.98%
10-2011	19.05%	18.14%	2.26%	9.24%	7.36%	7-2014	13.01%	14.01%	3.17%	11.05%	6.96%
11-2011	19.14%	18.18%	2.29%	9.22%	7.30%	8-2014	12.97%	13.99%	3.18%	11.12%	6.96%
12-2011	18.76%	17.85%	2.35%	9.27%	7.25%	9-2014	12.73%	13.89%	3.19%	10.94%	6.94%
1-2012	19.14%	17.97%	2.43%	9.36%	7.37%	10-2014	12.19%	13.21%	3.26%	10.69%	6.77%
2-2012	19.09%	18.23%	2.47%	9.37%	7.45%	11-2014	12.03%	13.21%	3.23%	10.67%	6.75%
3-2012	19.00%	18.25%	2.51%	9.38%	7.46%	12-2014	11.74%	12.82%	3.10%	10.53%	6.54%
4-2012	18.64%	18.25%	2.55%	9.49%	7.46%	1-2015	11.87%	12.89%	3.10%	10.66%	6.48%
5-2012	18.47%	17.86%	2.61%	9.52%	7.32%	2-2015	11.69%	12.76%	3.12%	10.64%	6.49%
6-2012	18.27%	17.75%	2.59%	9.55%	7.31%	3-2015	12.20%	13.04%	3.36%	10.88%	6.75%
7-2012	18.21%	17.87%	2.65%	9.67%	7.43%	4-2015	11.88%	12.76%	3.26%	10.68%	6.62%
8-2012	18.07%	17.98%	2.68%	9.87%	7.46%	5-2015	11.81%	12.73%	3.28%	10.72%	6.61%
9-2012	17.81%	17.93%	2.67%	10.15%	7.51%	6-2015	10.73%	12.26%	3.38%	10.79%	6.56%
10-2012	17.74%	17.82%	2.72%	10.25%	7.50%	7-2015	10.42%	12.16%	3.37%	10.71%	6.54%
11-2012	17.73%	17.69%	2.75%	10.28%	7.48%	8-2015	10.31%	12.30%	3.38%	10.69%	6.58%
12-2012	16.80%	17.27%	2.82%	10.47%	7.42%	9-2015	9.85%	12.18%	3.24%	10.70%	6.47%

Source: <http://www.nbp.pl/systemfinansowy/rsf022016.pdf>

Although growth of impaired loans was caused only to a little extent by changes in the CHF exchange rate, projects of helping bank customers who took the loans in this currency are widely discussed. Different assistance variants based on converting the loans into Polish zloty according to the historic exchange rate are discussed. The National Bank of Poland presented two most probable scenarios of the impact of these activities on the situation of banks measured by a change in the Return on Assets (ROA) indicator. Considering the fact that the share of mortgage loans, including those given in CHF, in banks' assets is varied, a percentage change in total bank assets for which the ROA indicator is within the accepted range was examined. Detailed data of the simulation are given in Table 5.

Table 5. Results of the simulation of the impact of the introduction of restructuring of foreign currency loans on commercial banks' ROA

ROA	Share in domestic commercial banks' assets		
	As of September 2015	Scenario I* all borrowers	Scenario II** borrowers who took loans in the years 2007-2008
< -3%	0.0%	35.7%	35.0%
< -3% ; -2%)	0.0%	20.3%	21.0%
< -2% ; -1%)	0.0%	11.9%	11.9%
< -1% ; 0%)	8.1%	3.0%	0.2%
< 0% ; +1%)	52.1%	24.8%	27.6%
>= +1%	39.8%	4.2%	4.2%

Source: <http://www.nbp.pl/systemfinansowy/rsf022016.pdf>

* Reimbursement of spreads and loan restructuring according to the historic exchange rate defined in the Act will include all borrowers who took loans in CHF regardless of the time when the credit agreement was concluded.

** Reimbursement of spreads will cover all borrowers who took loans in CHF regardless of the time when the loan agreement was concluded, however, restructuring loans according to the historic exchange rate defined in the Act will cover all borrowers who took loans in CHF in the years 2007-2008.

Conclusions from the simulations carried out by the National Bank of Poland (NBP) are rather pessimistic for the banking sector. According to the analysts' calculations the banking sector as a whole will lose ca. 44 billion zloty in the case of implementing the second variant of assistance for borrowers. In the case the first variant is implemented, this amount can be higher by ca. 20 billion (Report on the financial system stability, February 2016, p. 31).

Conclusions

The data presented in this paper let us formulate a conclusion that banks' credit policy including offering housing loans in CHF was a typical activity from the point of view of risk management, which in this case is of two-way nature. Banks did not have a possibility to affect the zloty exchange rate in relation to other currencies and similarly to other market participants took

risks. If the CHF exchange rate depreciated in relation to the zloty, customers who had liabilities in the currency would gain additional profits on account of differences in exchange rates. The situation for banks would be unfavourable. The share of CHF loans in banks' credit portfolios does not threaten stability of the banking system.

Considering the degree of the financial market development in Poland, it is hard to believe that banks used their monopolistic position as they do not enjoy one. Thus, they do not have a possibility of imposing their policy on clients. This is also indicated by differences in the interest rates on the loans in zloty and in foreign currencies.

Restructuring of mortgage loans in CHF according to the historic exchange rate may undermine stability of the banking system and become a dangerous precedent in market economy.

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Globalization and Regional Economic Integration in Africa.

The new opportunities caused by Tripartite Free Trade Area (TFTA)²

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ABSTRACT

Purpose - the purpose of the article is to investigate whether and, if so, to what extent, the creation of the Tripartite Free Trade Area (TFTA) between three regional formations in Africa, COMESA, EAC, and SADC, can be expected to create new opportunities for member states to develop trade under the conditions of globalization.

Design/methodology/approach – the article relies on the descriptive-analytical method. It analyzes national and foreign literature sources and statistical data provided by the UNCTAD and the IMF.

Findings – The analysis suggests that in theory, new opportunities can be expected to arise; whether these will be tapped in practice, however, depends on many factors difficult to achieve under African conditions, such as the improvement in economic complementarity between member states, infrastructure development, and the willingness to pursue further integration.

Research limitations/implications – The article deals with a relatively new formation and at present, it is still difficult to draw any far-reaching conclusions. The basic challenges of the new community were identified based on the analysis of trade between its member states thus far; a more extensive analysis will need to wait until the TFTA has been in place for a few years. It is difficult to predict the specific effects of preferential tariffs and the reduction or elimination of trade barriers to facilitate the movement of goods within the area, since the countries in question all show different levels of economic development; adopting shared solutions will bring them into open competition with stronger partners. It is not unlikely that the imbalance in intraregional trade signalled in the article will actually increase.

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Originality/value – The article analyzes a relatively new free trade agreement between three economic communities, a case unique in the African context. Even though its practical implementation may bring various effects, a voice on the matter provides a valuable contribution to the debate.

Keywords: Globalization, Regional Economic Integration; Regional Trade Agreements (RTAs); Tripartite Free Trade Area (TFTA); Africa

JEL classification: F150; F10; F60

1. Introduction

Globalization and regional economic integration are among the main trends in the development of the contemporary world economy. The complementary character of these two processes seems to be confirmed by their simultaneous development over the second half of the 20th century. The dynamic development of globalization did not stifle the tendency to enter into new integrating agreements (regionalism). On the contrary, the number of Regional Trade Agreements (RTA) has been growing exponentially since the early 1990s (see World Trade Report 2011). Self-initiated tendencies for further development of integrative ties between geographically proximal countries have also seen a substantial growth.

The International Economic Integration theory focuses on the positive results of forming integration groups. Among these is the creation of large competitive markets, which stimulate trade and investment within the community. This in turn leads to economic growth and accelerates economic development. From an extra-economic perspective, integration is designed to improve the development of civilization, prevent conflicts, increase mutual trust among partners and ensure peace. It is particularly important for smaller states with weaker economies. Approximately one fourth of African countries have a population of less than 3 million people, and nearly two thirds of less than 20 million. Nearly half of African countries have an annual per capita income below USD 1000, and almost one fifth fall below USD 500. The situation is similar in terms of social development, as the bottom of the HDI ranking is composed exclusively of African countries: Eritrea, Mali, Burkina Faso, Chad, Mozambique, the Democratic Republic of the Congo, and Niger. It should be highlighted, however, that African countries are not uniform, and among many smaller markets one can also find large ones like Nigeria (with a population of 177m) and “rich” ones like Equatorial Guinea (with a per capita GDP over USD20k). Nevertheless, the African continent as a whole is considered to be the poorest in the world, while being quite wealthy in terms of natural resources.

Africa is a continent where the most groups and integrative agreements were brought to life (relative to the number of states). The majority of these arrangements were created in a short period of time, soon after the African states gained their independence. The integration was modeled on the neoclassical structure popular with the developed countries. However, after half a century of enacting this model, it becomes clear that it does not fulfill its purpose – it did not help the African countries with development and integration. Due to the weak state structures of the countries in this region and inefficient aid programs that failed to stimulate positive reactions between regionalization and globalization, at the end of the 20th century Africa was still at the periphery of world economy.

The 21st century brought with it a visible change, mainly in Africa's economic surroundings. As players like China, India or Brazil are successfully entering African markets, this period (exaggerating somewhat) may be considered as the end of European and American domination. China shows a particularly dynamic expansion, so much so that in 2009 it became the biggest trade partner to Africa, with over 15% of Chinese global FDI tied to this new market. Paradoxically, remaining on the outskirts of global economic trends turned out to be “beneficial” for Africa in that the most recent global financial crisis only had little impact on the continent. At the same time, the emerging markets' growing demand for raw materials resulted in a substantial increase in economic growth in Sub-Saharan Africa, where the annual growth rate was over 5%, with some countries reporting even better results (up to 8% growth rate). On the other hand, the new philosophy of outside investment (particularly popular in China) began to provide many economies with a much needed inflow of capital, often also invested in infrastructure, the lack of which is the cornerstone of many barriers to integration.

The 21st century is also the time of new integration initiatives on the African continent, such as the *Tripartite Free Trade Area*, the Free Trade Area between the *East African Community (EAC)*, the *Common Market for Eastern and Southern Africa (COMESA)* and the *Southern African Development Community (SADC)* set up in June 2015. The Tripartite free trade area is a significant step towards the planned *African Continental Free Trade Area (CFTA)*. In 2012, the AU decided to establish the CFTA through a series of successive steps: the implementation of the Tripartite FTA, the parallel completion of free trade areas in other regions, the consolidation of all the regional communities into a single continental free trade area in 2015/16, culminating in the official inauguration of the CFTA in 2017. The possibility to modify the completion date in line with actual progress is explicitly mentioned, and has transpired to be necessary as developments have lagged behind the schedule.

In this context, the aim of the paper is to examine the new opportunities created by the Tripartite Free Trade Area (TFTA) for the integration process in Africa. The following is the paper's

research hypothesis: under the conditions of globalization, regional economic integration (especially the new initiatives) can engender new trade opportunities for African countries.

2. Globalization and Regional Integration in Africa

Globalization is a relatively new argument for the regional integration of poorly developed countries, including those of Africa. Underway since the middle of the last century, the parallel processes of globalization and regionalization have engendered a number of opportunities and threats that affect all their participants. Countries currently pursue regional integration to increase their chances of facing the challenges of globalization and neutralizing its threats, over and above what they can achieve as independent economies (Szymański 2004, p. 309-313). A new concept, *fit for globalization*, has even emerged to discuss poorly developed countries, since within this group globalization is more often associated with exclusion and more likely to block than create opportunities to climb up the development ladder. In theory, regional integration is meant to “counteract” this phenomenon (Peters 2010, p. 37).

In Africa, regional integration has had a long history and many economic communities are already in place throughout the continent. The most important of these include one free trade area (as defined by the WTO), five customs unions, and one customs union with an accompanying agreement that guarantees the free movement of services³.

Such a large number of regional economic communities may come as a surprise, since local conditions in Africa are particularly unfavorable to the growth of regionalism. In many cases, the baseline development of participating countries is too low to ensure efficient regional cooperation, as

³ These communities include, respectively: the free trade area: the South African Development Community (**SADC**), which brings together Angola, Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique Namibia, Seychelles, Democratic Republic of the Congo, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. Customs unions: the South African Customs Union (**SACU**), composed of: South Africa, Swaziland, Botswana, Namibia and Lesotho; the Common Market for Eastern and Southern Africa (**COMESA**), composed of: Burundi, the Comoros, Democratic Republic of the Congo, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia Zimbabwe; the Economic Community of West African States (**ECOWAS**), including: Benin, Burkina Faso, Cape Verde, Côte d'Ivoire; Ghana; Guinea; Guinea-Bissau; Liberia, Republic of Mali; Niger; Nigeria; Senegal; Sierra Leone; The Gambia, Togo; the Economic and Monetary Community of Central Africa (**CEMAC**), composed of : Cameroon; Central African Republic; Chad; Congo; Equatorial Guinea; Gabon; West African Economic and Monetary Union (**WAEMU**) including: Benin; Burkina Faso; Côte d'Ivoire; Mali; Niger; Senegal; Togo. The most advanced of these is the East African Community (**EAC**), composed of: Kenya, Tanzania, Uganda, Burundi and Rwanda (WTO 2016).

the latter requires both political will (weakened, for instance, by the expected loss of budget revenues from duties abolished within the area) and actual expenditure, such as membership fees. In nearly half of African countries, 60% of total exports depend on a single product, often shipped outside the continent; the lack of adequate transport, telecommunication, and bank infrastructure or their bad condition makes the situation even worse. It is estimated that in landlocked African countries, the cost of transporting consumer goods accounts for as much as 30-50% of the final price (Qobo 2007, p. 3). Purely economic problems are compounded by other issues that weaken or destabilize the processes of regional integration, including political obstacles such as armed conflicts or different visions of integration between the African Union and individual regional formations, as well as between the communities themselves (Oppong 2009, pp. 5-6). The communities are bound by their agreements to achieve deep integration, which, in light of the specific factors at play throughout the continent and the often short implementation deadlines, has proved very inefficient thus far (more on the subject: Garlińska-Bielawska 2015, pp. 95-96).

3. *Tripartite Free Trade Area (TFTA)*

Negotiations for a free-trade area between the EAC, SADC and COMESA (*Tripartite Free Trade Area*, TFTA) were launched in October 2008 and produced a draft agreement with 14 appendices, which provided for the establishment of a free trade area with rather specific, deep objectives typical of the common market, i.e. the free movement of goods, services, and persons traveling for business purposes. A caveat stipulated that a possible customs union might be created in later course; however, this was not mentioned as an obligatory stage of integration. One of the adopted objectives of the agreement was also to counteract the key obstacle to integration, i.e. multiple, overlapping memberships in various regional formations, and to accelerate the process of both regional and continental integration (*Draft Agreement Establishing the COMESA, EAC and SADC Tripartite Free Trade Area*, Article 3, General Objectives).

The negotiations concluded with the signing of the agreement in Sharm El Sheikh (Egypt) in June 2015. The new free trade area spanned the three regional communities that brought together 26 African countries⁴, inhabited by c. 57% of the population of the African Union (AU) and generating 57% of its GDP (Shmieg 2015, p. 6).

⁴ The TFTA brings together: Kenya, Tanzania, Uganda, Burundi, Rwanda, Angola, Botswana, Democratic Republic of the Congo, the Comoros, Lesotho, Malawi, Mauritius, Mozambique, Namibia, RPA, Seychelles, Swaziland, Zambia, Zimbabwe, Egypt, Eritrea, Ethiopia, Djibouti, Libya, Madagascar, and Sudan (*Draft Agreement Establishing the COMESA, EAC and SADC Tripartite Free Trade Area*, 30.09.2016).

Multiple memberships not only generate commercial losses by reducing internal trade (Chacha 2014, p. 538-539; Sandrey 2015, p. 51), but also adversely affect the credibility of involved parties in terms of achieving regional integration objectives. Countries see them as a way to keep alternative options open, depending on current interests and expected benefits. The situation becomes especially complex when they join customs unions, such as the EAC or COMESA. The nature of such communities is that they introduce a flat customs tariff for external third parties and relegate the customs policy to the union level, which means that member states can no longer run independent trade policies. The situation is even more complicated: regional economic communities are not very open to liberalizing trade with third parties (Mazur 2013, p. 204), as evidenced by the average tariff levied on imports from other African countries, which stands at 13.3% and exceeds the average external tariff of 8.7% (Schmieg 2015, p. 6).

African governments have struggled to choose the optimal solutions for the regional structures that they form. The large number of multiple memberships suggests that they expect their benefits to increase as they join more communities, which is doubtful at best in the light of, for example, the different rules of origin that hold in various RECs. The problem is not limited to regional agreements, however; it is further compounded by negotiations/agreements with third parties, such as, for instance, talks over the Economic Partnership Agreements (EPA) with the EU, which are being held in a configuration that fails to reflect the African partners' actual membership in RECs (more: Erasmus 2015, pp. 2-3). There are grounds to suppose, therefore, that consolidating the 26 member states of the EAC, COMESA, and SADC within a single trade system may help mitigate the issues related to overlapping memberships in various regional integration agreements and communities.

The Tripartite Free Trade Area agreement is founded on three pillars: market integration, infrastructure development, and industrial growth. Particular attention is given to non-tariff barriers and a special mechanism to eliminate them has been put in place (*Mechanism for Reporting, Monitoring & Eliminating Non-Tariff Barriers, NTBs*), while the principle of variable geometry has been adopted for implementation purposes. The broad subjective and objective scope of the agreement may suggest it can be an important step towards a new strategy for regional integration in Africa. However, one should be cautious with such judgments, if only because of the currently limited share of Sub-Saharan Africa in worldwide exports, which does not exceed a low 3% (Unctad Handbook of Statistics 2015, p. 10). Caution is also dictated by intraregional trade indicators, which currently stand at 20% for the EAC and the SADC, and oscillate around 10% for the COMESA, despite the spectacular GDP growth observed in the region in the second decade of the 21st century,

reaching 6% for the EAC and the COMESA, and 4% for the SADC, and the auspicious terms of trade for the latter two communities (table 1).

Table 1. GDP growth, foreign and regional trade, and terms of trade for TFTA member states between 2013 and 2015

Formation	EAC			SADC			COMESA		
Years	2013	2014	2015	2013	2014	2015	2013	2014	2015
GDP growth (%)	5.8	5.9	5.8	4.2	3.5	2.7	6.1	6.5	6.0
<i>Per capita</i> GDP growth (%)	3.1	3.3	3.2	2.2	1.5	0.7	3.6	4.0	3.6
Exports of goods and services as % of GDP	19.3	18.0	19.1	36.5	35.3	31.6	25.6	24.5	22.1
Imports of goods and services as % of GDP	31.9	31.1	31.1	38.4	38.6	36.7	37.3	36.8	36.4
<i>Terms of Trade</i> (2000=100)	85.2	86.2	89.8	147.5	143.4	135.4	145.1	137.8	134.5
Intraregional trade (%)	17.8	18.4	N/A	18.5	19.3	N/A	9.2	11.0	b.d

Source: independent work based on: *Regional Economic Outlook, Sub-Saharan Africa* 2016, <https://www.imf.org/external/pubs/ft/reo/2016/afr/eng/pdf/sreo0416.pdf>, (30.09.2016) and *Unctad Handbook of Statistics* 2015, http://unctad.org/en/PublicationsLibrary/tdstat40_en.pdf, (30.09.2016).

In Africa, intraregional trade represents only 10-12% of the total, owing in part to the free implementation of liberalization measures within regional communities and their low economic complementarity, coupled by the underdevelopment of economic infrastructure. However, even though intraregional trade continues to be low compared to other parts of the world (e.g. 60% within the EU or 40% within NAFTA), it is worth noting that its share has been on the rise. In 2000, intraregional trade in Sub-Saharan Africa accounted for an average of 9.7% of total exports in the SADC, 5.3% in the COMESA, and 19.8% in the EAC; nine years later, the figures had climbed to 10.8%, 7.1%, and 18.9%, respectively. A similar trend could be observed for imports; between 2000 and 2009, intraregional imports represented, on average, 9.7% of the total for the SADC, 5.3% for the COMESA, and 19.8% for the EAC, only to rise to 10.8%, 7.1%, and 18.9%, respectively, in 2009 (Hartzenberg 2011, p. 11). However, trade in each of the regional economic communities has been dominated by one or several countries. As many as 62% of all exports in the SADC originate in South

Africa, 67% in the COMESA come from Kenya (27%), Egypt (18%), Uganda (10%), or Zambia (10%), while 73% in the EAC are accounted for by Kenya alone. The commodity structure of intracontinental exports is also poorly diversified. The regional exports of South Africa, for instance, are dominated by mechanical vehicles designed for transporting goods, fuels, and bitumen products. Kenya focuses on the export of tea and mate, as well as fuels and bitumen products; Egypt supplies gold and petroleum; Uganda exports limestone, cement, and tobacco; and, last but not least, Zambia specializes in cement, copper, and copper ores (*Economic Development in Africa. Intra-African Trade: Unlocking Private Sector Dynamism* 2013, p. 33-34).

The situation looks similar for regional imports. 66% of the total for the SADC is accounted for by just four countries: South Africa (21%), Zambia (18%), Zimbabwe (17%), and Mozambique (11%). In COMESA, 47% of imports arrive in Sudan (13%), Uganda and the Democratic Republic of the Congo (12% each), as well as Egypt (11%). Finally, Uganda (40%) and Tanzania (27%) dominate the imports within the EAC (Hartzenberg 2011, p. 12). The asymmetry of regional trade is difficult to reduce both in terms of the dominant countries and the goods they export; in addition, while it is crucial to improve the conditions created by institutional frameworks, the actual key to regional integration will lie in the improvement of factors such as economic complementarity, infrastructure development, and the political will, etc. It must be emphasized, however, that industrial growth and infrastructure development already form two of the three main pillars of the TFTA, and the newly adopted rules of origin focus on the internal supply of production components.

With the above in mind, table 2 presents a SWOT analysis of the TFTA agreement.

Table 2. SWOT analysis of the *Tripartite Free Trade Area (TFTA)* agreement.

Strengths	Weaknesses
<ol style="list-style-type: none"> 1. The free trade area will tap the combined potential of nearly half of African countries, which generate more than 50% of the continent's GDP. 2. The agreement makes it possible to reduce the adverse effects of 	<ol style="list-style-type: none"> 1. Member states differ widely in terms of their surface area, access to ports, natural resources, GDP, etc. 2. There exists a large asymmetry in intraregional trade and its indicators are low.

<p>multiple memberships in African regional economic communities (RECs)</p> <p>3. It is a comprehensive agreement that also provides for industrial growth and infrastructure development.</p> <p>4. The agreement provides for liberalization measures based on eliminating both customs duties and non-tariff barriers (NTBs).</p>	<p>3. Many signatories belong to the least developed countries (LDC) of the world and the bulk of their revenues depend on the export of unprocessed raw materials outside the continent, which means that the provisions of the agreement may still prove insufficient to stimulate intraregional trade.</p> <p>4. Many African countries (Rwanda, Democratic Republic of the Congo, Libya) are plagued by a complicated political situation.</p>
Threats	Opportunities
<p>1. “Competing” negotiations for <i>Economic Partnership Agreements</i> (EPAs) between the European Union and the ACP countries are held in regional areas that do not reflect the scope of African regional economic communities. This leads to the bilateral liberalization of mutual trade and services; home producers may find it hard to face the resulting competition in African markets.</p> <p>2. Delayed implementation of agreements in individual member states.</p>	<p>1. The importance of the region in world trade (though still low) has been growing since the beginning of the 21st century. Beneficial terms of trade.</p> <p>2. An important step towards a more ambitious agreement that would span the entire continent, creating a <i>Continental Free Trade Area (CFTA)</i>.</p>

Source: independent work.

4. Conclusions

The above analysis suggests that the tripartite agreement between the EAC, the SADC, and the COMESA indeed creates new opportunities for African countries to develop trade in the context of globalization. This is because:

- it successfully addresses the current need for integration on the African continent and its goal is to “unite rather than divide” existing economic communities (creating a “deep” free trade area between the three formations that bring together as many as 26 countries, i.e. almost half of all African countries).
- it can be a step forward in the endeavor to rationalize the integration process in Africa, as on the one hand, it is consistent with the actions taken by the African Union, and on the other, provides a systemic response to the issue of multiple memberships and a solution to intensify the growth of regional trade (further liberalization of intraregional trade with the elimination of non-tariff barriers).
- it can make it possible for all three formations, along with their various member states, to meet their obligations, but may also cause implementation delays (the principle of variable geometry).

It should be emphasized, however, that the analysis of the history of African economic communities thus far and the current situation in intraregional trade (EAC, SADC, COMESA) dictates a modicum of caution about the results to be expected both in the shorter and the longer term. Even though the share of intraregional trade has been on the rise, it continues to be very low, and the economies of member states continue to be substitutional rather than complementary, with an underdeveloped infrastructure and low willingness to integrate, especially in view of the diminishing revenues from customs duties as a result of trade liberalization.

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International Patenting: An Application of Network Analysis

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Abstract

The aim of this paper is to examine the behavior of patenting abroad using social network analysis on the patent data for 192 countries in the period 1995-2009. We estimate the metrics of the international patenting network for the years 1995, 2000, 2005 and 2009 in order to recognize and possible evolution of the network. Our findings indicate that in the fifteen years period the international patenting network evolved with increasing number of connections, increasing weights and became more connected. The estimated metrics of the network verified the previous findings of the literature that the countries which exhibit high innovative activity attract patents from abroad. Also, the estimated preferential attachment indicator suggests that the probability of patenting a new patent in a foreign country is highly correlated with the authority index.

Keywords: International patenting, Social network analysis.

1. Introduction

With the advent of globalization and financial economic interactions among countries international patenting has become widespread. In the pursuit of economic growth, every country has sensibly invested in international cooperation, learning innovation, technology diffusion and knowledge. The international diffusion of new products and processes is often regarded as a major driving force of world economic growth. Eaton and Kortum (1996) argue that more than 50% of the productivity growth in every OECD country other than the U.S. results from ideas originated abroad.

Since 1988 major changes have eventuated in the field of patents, namely: the changes in the patent framework inside the US, the TRIP agreement under the Uruguay round and the significant upsurge of international trade and foreign direct investment. As a result international patenting activity has attracted an increasing attention in literature even though in a less degree comparing to other measures

of international technology diffusion. Eaton and Kortum, (1996) found that physical distance, human capital and patent protection framework of the destination country affect the patenting abroad decision. McCalman (2001) estimated the impact of the GATT – Uruguay round on the transfer of income and McCalman (2005) estimated the impact of the TRIP agreement on the short and long run growth. Chan (2006) found that intellectual property protection is a significant factor in the decision of the agricultural biotechnology firms to patent abroad.

Even though the application of gravity has a long history in trade literature (Anderson, 1979; Bergstrand, 1985; 1989; Bougheas et al., 1999; Smith, 1999; 2001), its use in other international flows is limited. Harhoff et al. (2007) relied on a gravity model that aims at explaining patent flows between inventor and target countries within the European patent system. More recently, Picci (2010) adopted a gravity model to study the determinants of the intensity of collaboration between pairs of countries and discussed the extent and the determinants of the internationalization of European inventive activity. Finally, Archontakis and Varsakelis (2011) adopted the gravity model based on the theoretical foundation of Anderson (1979) to explain the flow of US patents to the OECD countries.

Previous literature has used econometric techniques to evaluate the decision of patenting abroad. The aim of this paper is to examine the behavior of patenting abroad using social network analysis on the patent data for 192 countries in the period 1995-2009. We estimate the metrics of the international patenting network for the years 1995, 2000, 2005 and 2009 in order to recognize and possible evolution of the network. Our findings indicate that in the fifteen years period the international patenting network evolved with increasing number of connections, increasing weights and became more connected. The estimated metrics of the network verified the previous findings of the literature that the countries which exhibit high innovative activity attract patents from abroad. Also, the estimated preferential attachment indicator suggests that the probability of patenting a new patent in a country is highly correlated with the authority index.

The rest of the paper is organized as follows. Section 2 offers a theoretical foundation of the for international patenting activity and sets the research hypotheses of the paper. Section 3 presents the data, the empirical results and the discussion. Finally, Section 4 offers some concluding remarks and policy implications.

2. Theoretical background and hypothesis settings

Even though patent is a flawed measure of innovation process output, because not all innovations are patented and patents differ greatly in their economic impact, a patent indicates new knowledge-

technology (Griliches, 1979). Patents are considered as important innovation indicators that document the end of an innovation process and show how an organization can commercialize an innovative idea. The main aim of patenting is to protect innovation from imitators but this protection is provisional since the decision to patent depends among other factors on the registration cost and the renewal fee.

Inventors patent their invention in foreign countries because a single national patent does not protect an invention in the global market. A firm or a patentee decides to patent in a foreign country in order to protect its innovation from imitators that would produce there or export there from a third country. However, only a fraction of source country inventors seek patent protection abroad. The patenting in any additional country costs and consequently firms do not patent their inventions in every country but they choose. Hence, international patenting not only reveals valuable information on the international competitiveness of firms but also signals where innovations are most likely to be used. The question is where to patent. Eaton and Kortun (1996) suggested that international patenting is correlated with the R&D activity in the home economy. Moreover, the total number of patents the inventors of the home country are granted in the rest of the world are different from the total number of patents granted to the citizens of home country by the country's patent office. This is due to the following reasons. First, as Cohen and Levin (1989)

Cohen, W., & Levin, R. (1989). Empirical studies of innovation and market structure. In Schmalensee, R., & Willig, R., (eds). *Handbook of Industrial Organization II*, New York: Elsevier.

argued not all patent granted by a patent office have economic value. Second, some of the patents having economic value are not exploited commercially because the patentee does not see any technological or entrepreneurial opportunity in it. Third, some patentees commercially exploit their patents in the home market and do not aim to expand in the international market. Hence, only a share of the patents granted by the home patent office has international economic value and the patentee should protect it in foreign markets. Besides, according to Eaton and Kortun (1996), patentees from one country do not to patent in a foreign one because they are concerned of technology diffusion to their competitors in the destination country. However, Archontakis and Varsakelis (2011) noted that the dramatic institutional change, the introduction and development of the *Internet*, have facilitated in the most high degree information diffusion since the patent offices provide information on patents on almost real time. After patenting in one patent office information diffuses in international markets and the disclosure of the inventions is not limited to protecting countries, but is global. Therefore, the

exploitation outside the protecting countries is almost free or at minimum economic cost while the benefits promised to the inventor in exchange for the disclosure are limited only to the protecting countries.

A patentee decides to patent in a specific destination country because of the increasing business opportunities and the imitation risk. Imitation comes from two sources:

First, the imitation by local firms established in the destination country. A domestic patentee who wishes to protect its invention abroad should patent in countries with high R&D activity.

Second, is an attempt to develop special technology in which the recipient country has comparative advantage and which complements the firm's core technology.

Third, the imitation by firms established in another than the destination country. Outsiders could imitate and sell the product to the destination country by registering their own patents in the destination country, if they recognize any technological and commercial potential. As long as a domestic invention is unprotected in such countries, outsiders have an incentive but also the potential to imitate.

Putnam (1996) argued that a country's percentage of a total value of patent rights granted worldwide is correlated to the relative size of its domestic economy. Bosworth (1984), using an international data as indicator of technology transfer, finds for the case of the U.K. a strong association between patenting and foreign direct investments. International patenting is a central part of a firm's export strategy. This is due to the fact that since patenting implies disclosure of information, competitors may have the chance to invent around the patent product and consequently international patenting is the proper way to protect firm's interests..

Based on the previous discussion we set the research hypothesis of this paper. International patenting activity could be represented as a network with nodes representing countries and edges representing the flow of patent from the country of origin (authority) to the destination country (hub). Therefore, the countries that exhibit strong innovative activity, measured by social network metrics such as centralities, authority-hub, preferential attachment are significant hubs that is nodes-countries which attract more patents.

3. Data and empirical results

The empirical investigation of the hypothesis set in the previous section is pursued using social network analysis on the number of patent applications from the country of origin to the destination country (192 countries) for the years 1995, 2000, 2005 and 2009 as data points. Data were from WIPO

statistics database. We construct the adjacency matrix with the countries as rows and columns. Each element of this matrix denotes the number of patents applications from the country of origin (row) to the destination county (column). This adjacency matrix represents a weighted and directed network. We constructed four adjacency matrices, one for each year: 1995, 2000, 2005 and 2009. We select these representative four years because we would like to compare the evolution of the international patenting activity between the 192 countries over this period.

The weighted and directed network consists of 192 nodes (the countries). The number of edges (links) evolved from 1704 in the year 1995 to 2083 in the year 2009. This growth rate of 15% describes how the international patenting network becomes more complex and dense and more countries attract patents but also apply for patents abroad during this period. This increasing complexity might be attributed to the exponential growth of trade and foreign direct investment.

We apply a selection of social network statistics to characterize the topology of the network. The definitions and the algebraic forms of the metrics are not presented here and can be found in any standard network analysis book. In the next part, we present the global characteristics of the international patenting network and in the following the country specific characteristics. For the economy of space we present the data for the initial (1995) and final year (2009) of the examination period.

3.1. International Patenting Network Global Characteristics

In this part we present some general topological characteristics of the international patenting network. Table 1 presents some of the metrics characterizing the topology of the network and its evolution during the examination period. The average node degree, the sum of edges of a node, increased from 8.87 in 1995 to 10.85 in 2009 indicating that more countries participate in the international patenting activity. On average, more patentees apply for patents in more destination countries and more countries receive applications from abroad. Besides, the average weighted degree increased by more than two fold compared to the non-weighted degree, from 1210 in the year 1995 to 3004 in the year 2009. This could be attributed to the fact that the number of patents abroad also increased. That is even though the number of patenting partners increased the total number of patents increased even more. That is some new countries added into the network during the fifteen years examination period but the increase in the number of patents was higher.

A dense graph is a graph in which the number of edges is close to the maximal number of edges. A graph with few edges is characterized as sparse graph. The distinction between sparse and dense

graphs is rather vague and depends on the context. A complete graph has all possible edges and density equal to 1. The density of the international patenting network increased from 0.046 in 1995 to 0.057 in 2009 but still is characterized as sparse even though the number of links increased by 15% over this period.

The average clustering coefficient (Watts and Storage, 1998) is measured as the average of the local clustering coefficients. If the ACC is 1 it is fully connected, while if it is zero it is hardly to see any connection. The ACC along with the mean shortest path may indicate a “small world” effect and how nodes are embedded in their neighborhood. The empirical finding verify the fast velocity of clustering over time since the average clustering coefficient increased from 0.36 in the year 1995 to 0.45 in the year 2009. The average weighted clustering coefficient is similar the simple ACC indicating the cluster of countries which tend to exchange patents expand homogenously in size and independently of the volume of patents. Thus, in the international patenting network the estimated ACC shows that in the triangle of three countries C_1, C_2 , and C_3 , if C_1 exchanges patents with C_2 and C_3 it might be very probable C_2 to exchange patents with C_3 . We should also notice that the average path length is short, just 1.9 for the year 1995 and 1.8 in the year 2009. This rather short path along with the number of shortest paths which seems rather high for the size of the network and increasing during the examination period, might be an indication for the existence of “small world” effect.

In terms of network topology, transitivity indicates the presence of a heightened number of triangles in the network sets of three nodes each of which is connected to each other. The increase in the transitivity metric, even though this increase was still low, from 0.3657 in 1995 to 0.3809 in 2009 is an indication that international patenting network is becoming more connected and assuming that the network is also a network of ideas, the world becomes more homogeneous since the transitivity property facilitates the diffusion within groups.

The general topological properties give us the idea that the innovation and research world becomes more connected during the examination period. Even though the network is relatively sparse, the empirical finding support the hypothesis that more countries enter into the international innovation system and more inventors decide to patent abroad.

3.2. International Patenting Network Country Specific Statistics

In this part we present and discuss the empirical findings at country level. Given the high number of countries we choose to present in tables 2 and 3 the metrics for the top 30 countries and for the years

1995 and 2009. We discuss the metrics that verify our research hypothesis namely authority, hub and preferential attachment.

The empirical investigation is based on the property of the international patenting network which is weighted and directed. The USA has the highest number inward links, 86, and 38 outward links in the year 1995, but Australia has 61 out degrees higher than the number of USA out degrees. We note the behavior is similar when we analyze the weighted out and in degrees.

The authority score of a node is the sum of all the hub scores of nodes that point to it. Thus node's hub score is the sum of the authority scores of all its linking nodes. In other words, a good hub represented a node that pointed to many other nodes and increases the authority weight of the node it links, as example USA good hub for the four tested years increases its authority per year, in 1995 and 2009 from 0.040341(Hub) to 0.049 (Authority) and 0.025974 (Hub) to 0.034835 (Authority) correspondingly.

Preferential attachment denotes that the more connected a node is, the more likely it is to receive new links. Nodes with higher degree have stronger ability to grab links added to network. When choosing the nodes to which the new nodes connect, we assume that the probability $p(k_i)$ that a new node will be connected to node i depends on the degree (k_i) of node i such that:

$$p(k_i) = \frac{k_i}{\sum_j k_j}$$

where k_i is the degree of node i and the sum is made over all preexisting nodes j .

This form of preferential attachment means that the highly connected nodes attract more new nodes than others. This network should increase with the number of its outgoing links (out-degree), and decrease with the number of its incoming links(in-degree). This means that new nodes prefer connecting to existing nodes with more outgoing and fewer incoming links because they provide more resources per incoming link. Therefore, at least in the short run, the older nodes in the system would have more edges compared to new coming ones. Due to the preferential attachment, the probability for a new node to become a rich node decreases as the network grows. As a result, rich nodes are not well connected between each other. This suggests a simple modification to these models to generate a rich-club. As the network grows, new links appear which are preferentially attached between the existing nodes.

Table 2 shows that the correlation between preferential attachment and out-degree is always positive, it is easy to see that they both rise or fall together in the same direction. Why countries prefer to attach

their edges to these that have more edges? Large out-degree predicates trustworthy countries will benefit them profile countries with many edges will be judged as more popular than a profile other with few edges. If the benefit obtained by interacting with countries is greater than the cost, they will continue to maintain these relationships. Tables 2 and 5 show how the sum of out-degrees increases continually, in course of time, from 859 in 1995 to 1540 in 2009. Instead that the sum of in-degree decreases from 1499 in 1995 to 1095 in 2009. Our results show how authoritative and hub of countries reinforce one another for all years from 1995 to 2009. Authorities and hubs have a mutual reinforcement relationship as a strong hub pointed to many strong authorities and *vice versa*.

4. Concluding remarks

The aim of this paper was to examine international patenting activity as a social network with nodes representing countries and edges representing the flow of patents from the country of origin (authority) to the destination country (hub). In this network framework we posited the hypothesis that countries which exhibit strong innovative activity, measured by social network metrics such as centralities, authority-hub, preferential attachment are also significant hubs that is nodes-countries which attract more patents. In other words patentees for innovative countries decide to patent in foreign countries which are also innovative.

In order to investigate the research hypothesis of the paper we applied social network analysis on patent applications by patent office and country of origin. We used data for 192 countries over the period 1. The network grew by a ratio of 15% and shows that the international patenting network became more complex and denser and more countries attract patents but also apply for patents abroad during this period. This increasing complexity might be attributed to the exponentially grown trade and foreign direct investment. This finding also indicates that more countries participate in the international patenting activity and the on average patentees apply for patents in more destination countries. The increase in the transitivity metric is an indication that international patenting network is becoming more connected in this fifteen years period with more countries, especially the developing ones, increase their participation in the network. However, the highly innovative countries constitute a strongly connected component of the network.

The research hypothesis is supported by the empirical findings, since the authorities and hubs are highly correlated. Our empirical statistics fetch proof to the fact that high or low network degree vertices tend to preferentially connect to other vertices with high preferential attachment.

Our findings have policy implications for the technological policy a country could follow. The international diffusion of new products and processes is often regarded as a major driving force of world economic growth. More than 50% of the productivity growth in every OECD country other than the U.S. results from ideas originated abroad. Due the public good character of knowledge, the seed and the quality of the diffusion process of innovations is strongly influenced by the patenting strategies of globally operating firms. As countries have become increasingly dependent economically on each other to be competitive in international markets, companies are actively engaged in innovation activities. Internationalization of research and development and innovative activities is an important component of the ongoing trend towards globalization of the economy. All these issues help to build capacity to conduct international collaborative research globally because networking is an important dimension of capacity building. Therefore, an important policy tool for developed and developing country should be the financing of the research and development activities. Only in such a way the less technologically developed economies will build up the absorptive capacity to exploit the global knowledge as quoted in international patents. Consequently, the creation of new knowledge will accelerate contributing to the speed up of the economic development.

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Table1: International Patenting Network : Global Properties

	1995	2000	2005	2009
Nodes	192	192	192	192
Edges	1704	1660	1754	2083
<i>Network Overview</i>				
Average degree	8.875	8.646	9.135	10.849
Avg.weighted degree	1210	1739	2762	3004
Diameter	4	4	4	4
Radius	0	0	0	0
Average Path Length	1.91	1.906	1.872	1.884
Number of Shortest paths	6312	7064	8385	9835
Graph Density	0.046	0.045	0.048	0.057
Modularity	0.094	0.081	0.116	0.089
Number of Communities	85	85	61	43
Number of Weakly Connected Components	84	84	60	42
Number of Strongly Connected Components	140	132	130	128
assortativity	-0.4116	0.3769	-0.3768	-0.4134
<i>Node Overview</i>				
Avg.Clustering Coefficient	0.35	0.338	0.386	0.454
Average Node Strength	2420.99	3478.323	5525.427	6009.708
Avg.weighted Cluster Coefficient	0.342	0.316	0.358	0.403
Clustering Coefficient (Avg)	0.178	0.159	0.192	0.215
Eigenvector Centrality	0.00222	0.00171	0.009625	0.007583
Transitivity	0.3657	0.3920	0.3575	0.3809
<i>Link Communities</i>				
Threshold	0.5	0.5	0.5	0.5
partition Density	0.391	0.497	0.403	0.377
Average Neighborhood Overlap	0.414	0.443	0.425	0.373
Average Embeddedness	28.809	28.984	28.259	28.638

Table 2
Top 30 Countries – Country Level Indices, 1995

	In-Degree	Out-Degree	Degree	Weighted Degree	Weighted In-Degree	Weighted Out-Degree	Closeness Centrality	Betweenness Centrality	Authority	Hub	Preferential attachment	Clustering Coefficient	Weighted Clustering Coefficient	Eigenvector Centrality
USA	86	38	124	134338	50677	83661	1.424	519.129	0.049	0.04	0.0358	0.202	0.251	1
Australia	55	61	116	14547	2328	12219	1.076	2460.731	0.032	0.031	0.0223	0.216	0.326	0.854
United Kingdom	78	35	113	18363	10994	7369	1.485	430.292	0.045	0.039	0.0211	0.229	0.178	0.972
Germany	77	35	112	38397	31408	6989	1.485	233.028	0.044	0.039	0.0211	0.241	0.088	0.96
France	75	30	105	16409	13099	3310	1.561	191.185	0.043	0.04	0.0205	0.252	0.113	0.995
Japan	71	34	105	82873	62026	20847	1.5	282.269	0.041	0.036	0.0205	0.258	0.12	0.931
Switzerland	76	23	99	9974	9203	771	1.667	118.288	0.043	0.04	0.0205	0.249	0.082	0.972
Canada	57	36	93	18623	6316	12307	1.455	154.109	0.033	0.033	0.02	0.344	0.31	0.935
Austria	66	21	87	2580	2200	380	1.697	102.934	0.038	0.033	0.02	0.282	0.104	0.9
Spain	64	23	87	1887	1398	489	1.667	78.16	0.037	0.036	0.0194	0.305	0.174	0.921
Israel	54	33	87	4836	1694	3142	1.5	121.406	0.031	0.034	0.0194	0.369	0.328	0.919
Netherlands	62	23	85	5054	4573	481	2.061	35.124	0.036	0.036	0.0188	0.329	0.127	0.946
Belgium	60	23	83	2713	2370	343	1.667	81.801	0.034	0.035	0.0182	0.333	0.106	0.892
Italy	69	11	80	5330	5269	61	1.848	147.571	0.04	0.036	0.0176	0.283	0.168	0.965
Sweden	54	26	80	4257	3505	752	1.621	51.992	0.031	0.031	0.0176	0.371	0.114	0.868
Republic of Korea	48	30	78	19985	6877	13108	1.561	51.676	0.028	0.031	0.0176	0.415	0.337	0.856
Russian Federation	42	35	77	4258	492	3766	1.47	143.778	0.024	0.024	0.0176	0.368	0.467	0.606
Norway	49	22	71	2333	640	1693	2.076	22.125	0.028	0.029	0.0164	0.39	0.415	0.81
Finland	45	26	71	3602	1887	1715	1.621	39.375	0.026	0.029	0.0158	0.442	0.265	0.839
South Africa	37	33	70	6006	577	5429	1.515	76.418	0.021	0.022	0.0153	0.42	0.488	0.615
Denmark	48	18	66	1568	1380	188	2.136	9.304	0.028	0.029	0.0153	0.421	0.15	0.827
Hungary	39	22	61	1996	225	1771	1.667	45.621	0.023	0.026	0.0153	0.483	0.468	0.758
Brazil	31	28	59	3537	344	3193	1.591	17.38	0.018	0.021	0.0153	0.532	0.502	0.646
China	25	32	57	28935	10322	18613	1.545	15.97333	0.015	0.017	0.0147	0.551	0.179	0.483
Ireland	36	17	53	673	526	147	1.758	27.317	0.021	0.022	0.0147	0.489	0.192	0.66
India	18	34	52	5119	150	4969	1.5	9.588	0.011	0.012	0.0147	0.594	0.627	0.379
Mexico	20	31	51	4873	161	4712	1.545	33.794	0.012	0.012	0.0141	0.513	0.639	0.336
Czech Republic	24	26	50	1375	124	1251	1.621	16.226	0.014	0.019	0.0141	0.652	0.525	0.58
New Zealand	25	23	48	1638	450	1188	1.667	6.602	0.015	0.018	0.0135	0.625	0.466	0.52
Turkey	8	36	44	1520	14	1506	1.455	9.15	0.005	0.006	0.0135	0.648	0.736	0.197

Table 3
Top 30 Countries – Country Level Indices 2009

	In-Degree	Out-Degree	Degree	Weighted Degree	Weighted In-Degree	Weighted Out-Degree	Closeness Centrality	Betweenness Centrality	Authority	Hub	Preferential attachment	Clustering Coefficient	Weighted Clustering Coefficient	Eigenvector Centrality
USA	57	121	178	345555	133049	212506	1.19	2331.13	0.03	0.03	0.0581	0.12	0.19	0.99
Japan	53	82	135	199539	147795	51744	1.45	725.03	0.02	0.03	0.0394	0.23	0.1	0.95
Germany	57	68	125	72135	61047	11088	1.55	730.02	0.03	0.03	0.0384	0.25	0.06	0.97
China	47	76	123	95396	10627	84769	1.5	545.34	0.02	0.03	0.0365	0.23	0.41	0.83
Canada	41	80	121	46848	14760	32088	1.47	342.71	0.02	0.03	0.0355	0.23	0.32	0.74
United Kingdom	52	67	119	27380	21434	5946	1.56	452.99	0.02	0.03	0.035	0.25	0.09	0.92
Australia	39	73	112	28122	7110	21012	1.51	300.4	0.02	0.02	0.0336	0.26	0.35	0.7
Russian Federation	33	74	107	13984	1058	12926	1.51	334.29	0.02	0.02	0.0331	0.27	0.4	0.61
India	44	62	106	30622	4149	26473	1.6	312.11	0.02	0.03	0.0326	0.29	0.4	0.78
France	59	44	103	27855	26320	1535	1.73	426.34	0.03	0.04	0.0322	0.32	0.05	1
Brazil	32	70	102	18766	949	17817	1.54	228.61	0.01	0.02	0.0302	0.29	0.44	0.67
Republic of Korea	37	63	100	74506	38766	35740	1.58	165.97	0.02	0.02	0.0298	0.32	0.25	0.7
Italy	50	49	99	10153	9277	876	1.7	372.34	0.02	0.03	0.0283	0.32	0.05	0.89
Mexico	25	69	94	13876	449	13427	1.55	86.49	0.01	0.02	0.0283	0.3	0.5	0.51
Singapore	22	59	81	10149	2284	7865	1.61	86.54	0.01	0.01	0.0264	0.35	0.41	0.49
Spain	46	32	78	3264	3076	188	1.82	127.14	0.02	0.03	0.0264	0.43	0.07	0.83
New Zealand	22	55	77	6047	1286	4761	1.65	107.22	0.01	0.01	0.0235	0.39	0.42	0.48
Norway	32	42	74	4751	2417	2334	1.74	107.09	0.01	0.02	0.0211	0.48	0.25	0.63
Netherlands	46	28	74	17621	17408	213	1.86	48.5	0.02	0.03	0.0206	0.5	0.06	0.84
Israel	33	39	72	11244	7068	4176	1.76	106.55	0.02	0.02	0.0202	0.5	0.2	0.66
Ukraine	11	55	66	2710	332	2378	1.65	81.84	0.01	0.01	0.0187	0.39	0.48	0.28
Switzerland	48	15	63	20979	20632	347	1.99	22.01	0.02	0.03	0.0187	0.52	0.2	0.88
Denmark	41	20	61	4946	4828	118	1.93	22.79	0.02	0.03	0.0163	0.56	0.09	0.76
Turkey	27	32	59	405	229	176	1.83	114.01	0.01	0.02	0.0154	0.52	0.26	0.57
Finland	36	22	58	6401	6277	124	1.93	24.85	0.02	0.02	0.0154	0.59	0.05	0.75
Chile	16	39	55	1522	148	1374	1.77	17.67	0.01	0.01	0.0144	0.54	0.48	0.4
Belgium	39	14	53	5503	5366	137	2.01	17.68	0.02	0.02	0.0139	0.59	0.31	0.74
Egypt	5	43	48	507	43	464	1.91	70.6	0	0	0.0134	0.36	0.43	0.14
Ireland	29	18	47	2402	2349	53	1.97	78.64	0.01	0.02	0.012	0.63	0.16	0.62
Panama	16	29	45	451	85	366	1.87	13.66	0.01	0.01	0.0115	0.59	0.53	0.38

Macroeconomic and industry-specific determinants of bank profitability before and during the financial crisis: Empirical evidence from Greece

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Abstract

The purpose of this paper is to investigate the external factors that determine the profitability of a typical Greek systemic bank over the period 2001 – 2014. Towards this direction, a conceptual framework that integrates two major groups of constructs was developed. The first group of constructs regards industry specific factors while the second one concerns macroeconomic features. Regarding macroeconomic determinants, four distinct features were examined: GDP growth rate, unemployment rate, inflation rate and long term interest rate. Regarding the banking industry structure, two basic determinants were explored, that is the bank's market share, both in terms of deposits and in terms of assets, and the banking market growth, also both in terms of the market's total assets and total deposits as well.

For the purposes of the empirical research, quarterly bank level data and quarterly macroeconomic and Greek banking industry related data as well were collected. Furthermore, in order to investigate the impact of the financial crisis, the study examined two separate periods. Firstly, the period from 2001 to 2014 and secondly, excluding the deep economic depression, the period during 2001-2011 were separately examined. Consequently, with the means of ordinary least squares, linear multiple regression models were specified.

Overall, the empirical analysis provides evidence that bank profitability is shaped by both macroeconomic forces and industry related factors as well. As far as the macroeconomic features are concerned, the GDP growth rate effect is statistically significant and positive whereas the unemployment effect is statistically significant but negative. The inflation rate and the long-term interest rate effects were insignificant. The industry related features, rate of growth of the industry's deposits and bank's assets market share have a positive impact on bank profitability. Finally, the rate of growth of the industry's assets and the bank's deposits market share negatively influence the financial performance of the bank.

The novelty of this study is that it reveals the pattern that determines bank profitability over a recent period which includes the financial crisis. Moreover, understanding the way that macroeconomic forces and industry related factors affect bank profitability may enable banks to focus on the most critical factors in their decision process.

KEYWORDS: *Banking, Greek banks, bank profitability, determinants of profitability, financial crisis, decision process*

1. Introduction

The banking sector is considered to be the driving force of the Greek economy. Undoubtedly, banks in Greece serve a crucial role as financial intermediaries by providing stability to the Greek economy, sustaining entrepreneurship and facilitating money flows between the factors of the economy. Over the last decades, a series of important changes and developments resulted into the complete reformation of the Greek banking sector. Specifically, a series of mergers and acquisitions led to an entirely reorganized banking industry, characterized by a highly competitive environment. Moreover, the development of new products and services, the reorganization of their internal structure, along with the modernization of their networks and the benefits steaming from the common currency European market, signaled that Greek banks entered a new era (Chatzoglou *et al.*, 2010; Pasiouras and Sifodaskalakis, 2010; Noulas, 2001). However, after those years of deregulation and financial innovation the Greek banking sector almost reached the financial collapse, due to the financial crisis. Inevitably, the ongoing financial crisis has revived interest into the determinants of bank profitability. Besides, Whitten *et al.* (2002) consider profitability as one of the most substantial criteria used in order to evaluate bank financial performance. Furthermore, Athanasoglou *et al.* (2008) aptly argue that a healthy, sound and profitable banking sector is able to contribute to the overall stability and soundness of the economy. In the same spirit, Lee *et al.* (2015) regard bank profitability as a crucial factor of whether a bank will be able to overcome a financial crisis and thus survive. Moreover, for Dietrich and Wanzenried (2011), bank profitability is an indication of how efficiently and effectively a bank is managed. Therefore, the Greek experience following the financial crisis, offers a remarkable case for identifying the determinants of bank profitability, under the given financial and macroeconomic environment.

Consequently, this paper aims to examine the way that the attributes of the external environment may affect bank profitability. Although there have existed many studies exploring bank profitability in developed countries, empirical works on factors influencing bank profitability in Greece is relatively scarce. Consequently, the purpose of this paper is to complement and extend the existing literature by exploring the main determinants of bank profitability in Greece, taking at the same time into consideration the impact of the financial crisis. Specifically, a conceptual framework which is able to capture the effects of macroeconomic forces and industry specific factors on bank profitability is developed. A novel feature of this paper is the period over which the conceptual framework is being tested. On the contrary to other studies on Greek bank profitability, this paper utilizes data from the Greek banking sector over a relatively long period from 2001 to 2014. Moreover, the study's empirical results may prove to be useful to bank managers. Bank profitability is an indication of how well a bank is managed (Dietrich and Wanzenried, 2011), whereas it also indicates the financial status of the bank, providing at the same time an insight for future prospects. Besides, understanding the way that the macroeconomic environment as well as the structure of the banking industry may affect a bank's profitability is undeniably essential for every bank's decision process as far as strategy formulation and implementation as well is concerned. As such, being aware of the impact a change in a macroeconomic variable might have on bank profitability means that bank management should take the necessary actions in order to tackle any negative effect or even take advantage of a positive one on its profitability. Additionally, when an unforeseen change occurs in the external environment the management should be able to design a strategy which will enable the bank to overcome the shock in a way that its profitability shall suffer the least possible negative effect.

The rest of the paper is structured as follows. *Section 2* surveys the relevant literature on bank profitability focusing on the selected variables. *Section 3* outlines the model and the variables selected. *Section 4* describes the data sample and the methodology of the study, whereas *Section 5* presents the findings of the empirical analysis. Finally, *Section 6* concludes.

2. Review of the literature

The first remarkable studies on bank profitability were conducted by Short (1979), Bourke (1989) and Molyneux and Thornton (1992). Following them, a large and growing body of literature has focused on the determinants of bank profitability, taking also into consideration its importance to bank solvency and the overall banking sector stability as well (Dietrich and Wanzenried, 2011; Lee and Kim, 2013; Grove *et al.*, 2014; Athanasoglou *et al.*, 2008). Although, there is a part of the literature on bank profitability determinants that examines groups of banks worldwide such as Dietrich and Wanzenried (2014) and Mizraei *et al.* (2013), the majority of the studies survey bank profitability in specific areas, such as Lee *et al.* (2015), Grove *et al.* (2014) and Kanas *et al.* (2012) for US banks and Pasiouras and Kosmidou (2007), Staikouras and Wood (2003), Molyneux and Thornton (1992), Goddard *et al.* (2004) and Athanasoglou *et al.* (2006) for European banks. Moreover, some studies have explored the determinants of bank profitability in specific countries, such as Kosmidou *et al.* (2004) in UK, Trujillo-Ponce (2013) in Spain, Tan and Floros (2012) in China. As far as the case of Greece is concerned, bank profitability has been scarcely investigated by only a few studies. Recently, Kosmidou (2008) examined the determinants of Greek bank profitability during the period from 1990 to 2002, that is the period of the European Union financial integration, whereas, Athanasoglou *et al.* (2008) examined the impact of internal and external factors on Greek bank profitability during the period 1985-2001. Finally, Alexiou and Voyazas (2009) explored the influence of bank-specific as well as macroeconomic determinants on the profitability of Greek banks over the period from 2000 to 2007.

Research on bank profitability has mainly focused on two groups of factors as explanatory variables, namely internal and external determinants. Lee *et al.* (2015), Athanasoglou *et al.* (2008) and Staikouras and Wood (2003) define as bank specific determinants of bank profitability those factors that are influenced by the bank's management, whereas Kosmidou (2008) and Staikouras and Wood (2003) define as external environment determinants of bank profitability those external to the bank factors which cannot be influenced by its management. The latter are additionally divided into industry-specific and macroeconomic determinants of bank profitability. In particular, Grove *et al.* (2014), Kosmidou (2008) and Staikouras and Wood (2003) regard as industry-specific determinants of bank profitability these factors related to the external environment of banking institutions which demonstrate industry conditions. In addition, Grove *et al.* (2014) define as macroeconomic determinants of bank profitability, the variables which entail aspects of the overall economic conditions in the country where the bank operates. A considerable number of studies explores the explanatory power of macroeconomic forces on bank profitability (Athanasoglou *et al.*, 2008; Kosmidou, 2008; Lee and Kim, 2013; Bolt *et al.*, 2012; Tan and Floros, 2012; Pasiouras and Kosmidou, 2007; Alexiou and Voyazas, 2009; Jureviciene and Doftartaite, 2013) whereas a large body of literature investigates how industry specific factors affect bank performance (Bourke, 1989; Mizraei *et al.*, 2013; Athanasoglou *et al.*, 2006; Goddard *et al.*, 2004; Belkhaoui *et al.*, 2014; Pillof and Rhoades, 2002). Finally, the impact of the recent financial crisis on the determinants of bank profitability has been scarcely examined (Dietrich and Wanzenried, 2011; Lee *et al.*, 2015). The next section describes both the dependent and independent variables considered in this paper.

2.1 Bank performance measurement

Profitability is a way to identify how efficiently a bank is managed (Kilic, 2011; Dietrich and Wanzenried, 2011). With the purpose of measuring bank profitability various financial indicators have been utilized in the relevant literature on bank performance. In particular, bank profitability is mostly measured by the return on assets and return on equity ratios expressed as functions of various determinants (Bourke, 1989; Staikouras and Wood, 2003; Goddard *et al.*, 2004; Kosmidou *et al.*, 2004; Athanasoglou *et al.*, 2008; Alexiou and Voyazas, 2009; Dietrich and Wanzenried, 2011; Kanas

et al., 2012; Lee and Kim, 2013; Mizraei *et al.*, 2013; Dietrich and Wanzenried, 2014). Those indicators are used because of their obvious advantages; return on equity (ROE) is the ratio of net income for the full fiscal year after taxes to average total equity and reflects how efficiently the bank's equity has been used, while return on assets (ROA) is the ratio of annual net income after taxes to average total assets and indicates how efficiently the assets have been used to produce the profit achieved by the bank. According to Kosmidou (2008), average total assets and average total equity are used in order to avoid any discrepancies due to variations in the volume of assets and equity, respectively, within the period under examination. Nonetheless, there are only a few studies such as Bolt *et al.* (2012) and Dietrich and Wanzenried (2014) that complementary use alternative measures of bank performance such as net interest margin.

2.2 Determinants of bank profitability

The external determinants of bank profitability as presented in the extant literature include various macroeconomic factors as well as variables representing market characteristics.

2.2.1 Macroeconomic effects

Indisputably, the macroeconomic environment entails a number of forces which can create either opportunities or critical threats for banks. First of all, the rate of growth of gross domestic product (GDP) is highly considered to positively affect bank profitability. According to Staikouras and Wood (2003), Alexiou and Voyazas (2009), Growe *et al.* (2014) and Dietrich and Wanzenried (2011) a higher GDP growth rate results into higher demand for bank services, on the one hand, and lower loan default probability on the other, whereas banks are also able to charge higher fees and interest for their services, resulting therefore in higher profitability. Moreover, Karimzadeh *et al.* (2013) and Said and Tumin (2011) argue that GDP growth has a positive effect on the expectations of both the bank and the customers, implying hence that during economic booms not only customers' demand for new loans and financial services rises, but simultaneously banks are also more eager to increase loan supply. On the contrary, in the case of economic depressions the quality of loan portfolio deteriorates, resulting therefore in credit losses, and consequently in lower bank profitability (Albertazzi and Gambacorta, 2009; Lee and Kim, 2013; Apergis, 2009). The literature also provides evidence that the rate of unemployment has a negative effect on bank profitability. The unemployment rate, which directly affects average income, is considered to influence both the ability of consumers to repay undertaken loans and their ability to deposit. Moreover, the overall demand for financial services, including new loans, is negatively affected by unemployment (Bolt *et al.*, 2012; Louzis *et al.*, 2010). Therefore, banks face augmented losses due to increased loan defaults, on the one hand, whereas on the other hand, their income is at the same time negatively influenced. In their study on the determinants of non-performing loans Messai and Jouini (2013) brought to the foreground that unemployment negatively affects the profitability of banking institutions due to the negative impact it has on the quality of loan portfolios. In the same vein, Jureviciene and Doftartaite (2013) have also revealed a negative impact of unemployment rate on bank profitability.

2.2.2 Industry related effects

The structure of the banking industry is also a significant determinant of a bank's potential profitability. A number of studies have revealed a positive statistical relationship between variables of industry structure, such as either concentration ratios or market share and profitability (Molyneux and Thornton, 1992; Berger, 1995; Dietrich and Wanzenried, 2011; Dietrich and Wanzenried, 2014). Staikouras and Wood (2003) in their study, however, bring to the foreground a negative though statistically insignificant impact of market structure measures on bank profitability.

The relevant literature suggests that there are two different theoretical approaches that explain such a relationship (Berger, 1995; Goldberg and Rai, 1996; Yildirim and Phlippatos, 2007; Yildirim and Mohanty, 2010). The first viewpoint which is the structure-conduct performance hypothesis, suggests that banks operating in highly concentrated markets can impose prices and fees less favorable to consumers, as a result of imperfectly competitive markets. More particularly, in a concentrated banking sector, a bank can earn a favorable interest margin and result to monopolistic profits by imposing higher lending interest rates and lower deposit interest rates (Mizraei *et al.*, 2013; Athanasoglou *et al.*, 2006). Therefore, according to the structure-conduct performance hypothesis banks in more concentrated markets will earn higher profits than those operating in less concentrated ones, regardless of their efficiency. A more specific approach of the structure-conduct-performance hypothesis is the relative-market-power hypothesis. The relative market power hypothesis states that banks which include well-differentiated products and services in their portfolio can increase their market share and consequently exercise their market power by setting higher prices, resulting hence with abnormal profits (Berger, 1995; Athanasoglou *et al.*, 2008; Mizraei *et al.*, 2013). The second viewpoint concerns the efficient structure hypothesis, according to which efficient banks grow in terms of size and market share because of their ability to generate higher profits (Staikouras and Wood, 2003; Athanasoglou *et al.*, 2006). The variable which is mostly used in order to capture the influence of the market structure on bank profitability is the market share. Karimzadeh *et al.* (2013) and Growe *et al.* (2014) have revealed a positive effect of market share in terms of assets on bank profitability. On the contrary, Growe *et al.* (2014) argue that a high market share in terms of deposits is an indication that the bank funds its assets with more expensive capital sources; therefore, affecting negatively bank profitability. Besides, Belkhaoui *et al.* (2014) argue that deposits market share has a positive impact on bank profitability suggesting that banks with large market share have the possibility to achieve high profits. They argue that these banking institutions may be able to offer a portfolio of better-differentiated products which can be sold at high prices to their customers. Finally, another explanation is given by Kuzma and Shanklin (1992), who argue that customers are usually attracted by companies which possess larger market shares, insinuating additionally that profitability and market share are positively associated.

Another industry-related determinant of bank profitability is the growth of the market. A positive relationship between market growth and bank profitability has been revealed by Mizraei *et al.* (2013), who argue that a fast growing market tends to promote an environment which enhances higher earnings. Dietrich and Wanzenried (2014), on the contrary, argue that a fast growing market may possibly attract new probable entrants, meaning that the profitability of the existent market participants could be negatively affected. In line with the above, Bourke (1989) argued that an expanding market, improves the capability of generating higher profits, especially if associated with entry barriers. To the same direction, according to Pillof and Rhoades (2002) market growth has a positive effect on bank profitability, as long as, the consequential increased demand for bank services and product is not accompanied by a simultaneous and equivalent increase in supply. High assets growth rates in the banking industry, however, are often related to granting loans to customers with lower credit quality (Dietrich and Wanzenried, 2014; Apergis, 2009), which implies an indirect negative effect on bank profitability. In addition, Dietrich and Wanzenried (2011) argue that the growth rate of deposits negatively influences bank profitability, especially during the crisis period, because of the fact that banks do not have the ability to convert the increasing amount of deposit liabilities into higher revenue yielding assets.

Nevertheless, Table 1 summarizes the variables that will be further used in the empirical analysis of the study.

Table 1: The variables of the model

		Variable	Notation	Expected Effect	Related Literature	
Dependent variables		Return on assets	ROA		(Bourke, 1989; Staikouras and Wood, 2003; Goddard et al., 2004; Kosmidou et al., 2004; Athanasoglou et al., 2008; Alexiou and Voyazas, 2009; Dietrich and Wanzenried, 2011; Kanas et al., 2012; Lee and Kim, 2013; Mizraei et al., 2013; Dietrich and Wanzenried, 2014)	
		Return on equity	ROE			
Independent variables	macroeconomic variables	Percent growth of gross domestic product	GDP	positive	(Growe et al., 2014; Alexiou and Voyazas, 2009; Staikouras and Wood, 2003; Dietrich and Wanzenried, 2011; Said and Tumin, 2011; Albertazzi and Gambacorta, 2009; Lee and Kim, 2013; Karimzadeh et al., 2013)	
		Unemployment Rate	UNR	negative	(Bolt et al., 2012; Messai and Jouini, 2013; Louzis et al., 2010; Jureviciene and Dofartaite, 2013)	
	industry structure related variables	market growth	Growth rate of total assets in the Greek banking industry	AGR	negative	(Mizraei et al., 2013; Dietrich and Wanzenried, 2014; Bourke, 1989; Pillot and Rhoades, 2002; Apergis, 2009; Dietrich and Wanzenried, 2011)
			Growth rate of total deposits in the Greek banking industry	DGR	positive	
		Bank's market share	Bank's Assets market share	AMS	positive	(Mizraei et al., 2013; Molyneux and Thornton, 1992; Berger, 1995; Dietrich and Wanzenried, 2011; Dietrich and Wanzenried, 2014; Staikouras and Wood, 2003; Goldberg and Rai, 1996; Yildirim and Philippatos, 2007; Yildirim and Mohanty, 2010; Athanasoglou et al., 2006; Athanasoglou et al., 2008; Belkhaoui et al., 2014; Karimzadeh et al., 2013; Growe et al., 2014; Kuzma and Shanklin, 1992)
			Bank's Deposits market share	DMS	negative	

3. Data and methodology

The next section shortly describes the methodology followed in the study and presents information with regards to the data selection process. Moreover, the econometric model that was utilized in order to investigate the effects of the various macroeconomic and industry related factors on bank profitability is presented in this section.

3.1 Methodology

Attempting to investigate the external determinants of bank profitability in Greece a number of issues need to be considered and confronted. The Greek banking sector qualifies as a very interesting context with regards to exploring determinants of bank profitability, however, over the past few years it has experienced severe and significant changes. Following a series of mergers and acquisitions the Greek banking sector has resulted to be comprised by merely four systemic banks. The deficiency of an adequate number of bank level observations in order to perform a sound panel data analysis (Ahn and Schmidt, 1995; Kiviet, 1995; Judson and Owen, 1999; Blundell and Bond, 1998; Hedeker et al., 1999) was surpassed by moving beyond the methodology developed in previous studies of bank profitability. First of all, the time dimension of the dataset which was utilized has been long enough to capture the effects of macroeconomic and banking industry related variables on bank profitability. Secondly, following Yin (2012) and Seawright and Gerring (2013), a case study was chosen as the more appropriate research method. For that reason, one of the Greek systemic banks has been selected as the typical representative case and has served as the unit of analysis. Considering the fact that all four Greek systemic banks are essentially similar (Dietrich and Wanzenried, 2011) as they operate under the same regulatory standards, accounting rules and economic environment, within the same

country, across the period under investigation, it is reasonable to assume that the one which has been selected qualifies as a unit of analysis.

3.2 Data selection

The study utilized data from the Greek banking sector over a relative long period, from 2001 to 2014. In particular, quarterly accounting data have been obtained through the representative bank's annual, semi-annual, first quarter and third quarter financial results reports, balance sheets and income statements. The particular time period was chosen given that it offers recent time series data while it also constitutes a period which includes the financial crisis. Moreover, quarterly data regarding the macroeconomic and industry-related variables, over the same period, have been gathered from databases such as the Organization for Economic Co-operation and Development (OECD), International Monetary Fund (IMF), Bank of Greece, and Hellenic Bank Association (HBA).

3.3 Model formulation

This section describes an econometric model which examines the explanatory power of macroeconomic features and banking industry related attributes on bank profitability. Towards this direction, a multiple regression model is developed. Short (1979), Bourke (1989), Molyneux and Thornton (1992) and Goddard et al. (2004) in their studies conclude that linear models produce as good results as models of other functional forms. Therefore, a linear function of the following form is considered:

$$y = a_{0t} + b_{it} \sum_i^N X_{it} + c_{jt} \sum_j^M Z_{jt}$$

Where, a_0 is a constant, y is the dependent variable, X_i the explanatory variables regarding the macroeconomic environment, Z_j the explanatory variables regarding the banking industry structure and b_i and c_j their effects respectively on the dependent variable over time t . The model is specified with the means of ordinary least squares. Two approaches for the measurement of profitability are being followed. The first one regards ROA as the dependent variable (eq. 1), and the second one regards ROE as the dependent variable (eq. 2).

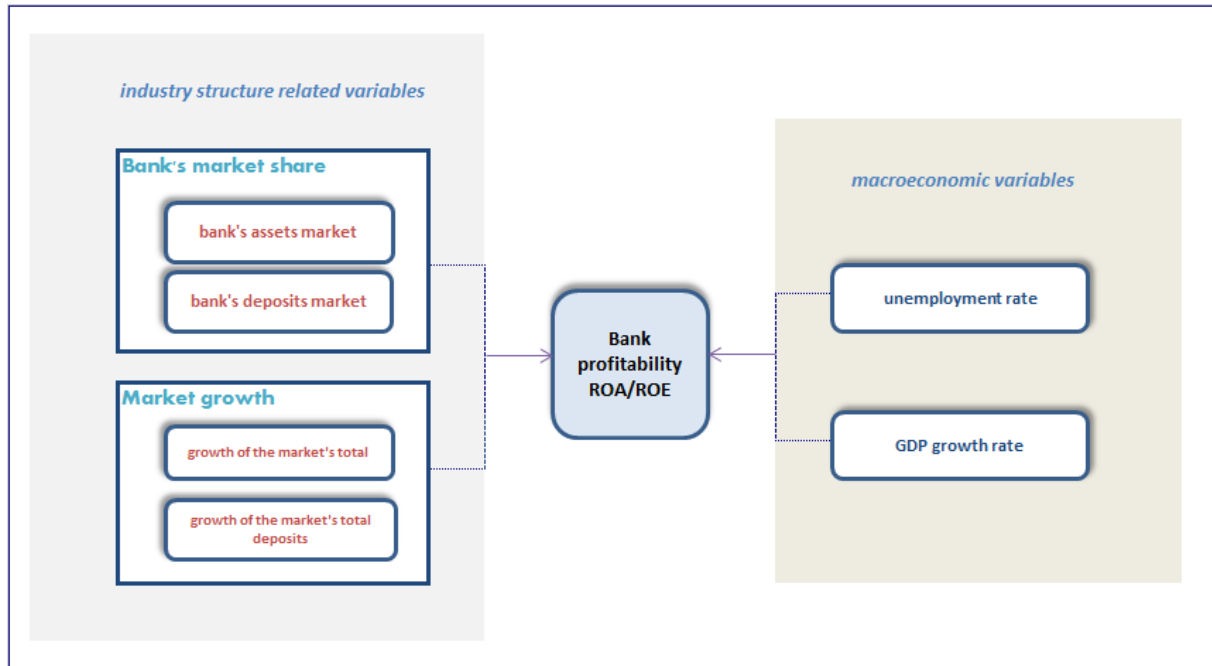
$$ROA_t = a_0 + a_1 GDP_t + a_2 UNR_t + a_3 AGR_t + a_4 DGR_t + a_5 AMS_t + a_6 DMS_t + u_t \text{ (eq. 1)}$$

$$ROE_t = b_0 + b_1 GDP_t + b_2 UNR_t + b_3 AGR_t + b_4 DGR_t + b_5 AMS_t + b_6 DMS_t + e_t \text{ (eq. 2)}$$

The models are tested for the existence of heteroscedasticity, autocorrelation and multicollinearity, so that the estimation of reliable - unbiased, efficient and consistent - coefficients can be reassured.

Consequently, this paper investigates in a single equation framework the effect of external forces on bank profitability. Figure 1 summarizes the econometric models into a conceptual framework.

Figure 1: The conceptual framework



4. Empirical results

This section presents the findings of the empirical analysis. A sequence of regressions was performed, for each model separately, in order to extrapolate the statistically insignificant explanatory variables, and conclude to the final specification of the models. Moreover, following the pattern of Dietrich and Wanzenried (2011) whose study examined Swiss bank profitability before and during the financial crisis and Lee *et al.* (2015) who examined how the determinants of U.S. bank profitability were influenced by the financial crisis, this research, aiming to isolate the effects of the financial crisis, was also conducted for two periods. The first period was from the 1st quarter of 2001 to the 3rd quarter of 2014 and the second period was from the 1st quarter of 2001 to the 1st quarter of 2011, excluding hence the deep recession period. Table 2, consequently, presents the results for the whole period; column 1 for the case of ROA while column 2 for the case of ROE as dependent variable, whereas Table 3 reports the results for the period before the crisis; column 3 for the case of ROA while column 4 for the case of ROE as dependent variable, respectively. Although there are not any major differences observed with regards to the factors which affect profitability among the models, the explanatory power of the models is significantly improved, when excluding the observations of the period during the financial crisis. Tests controlling for the existence of autocorrelation, multicollinearity and heteroscedasticity have also been performed and are reported also in Table 2 and Table 3 respectively to the model. Furthermore, the collinearity test controls the degree of correlation between the explanatory variables which were utilized in the multiple regression analysis. The results indicate that the independent variables are not correlated to such a degree that the regression analysis could be distorted. Moreover, White's test for heteroscedasticity indicates that the null hypothesis of heteroscedasticity is rejected, whereas Durbin-Watson test indicates that there is no evidence of autocorrelation. It is reasonable, therefore, to assume that the method of ordinary least squares has generated, unbiased, consistent and efficient estimators.

Table 2: Empirical results for the period 2001Q1 – 2014Q3

2001 Q1 - 2014 Q3						
	1			2		
	ROA			ROE		
Independent variable	coefficient	p-value	collinearity - test	coefficient	p-value	collinearity - test
constant	-0.000711	0.9327		0.004955	0.9692	
GDP	0.122334***	0.0781	0.582****	1.858295***	0.0794	0.582****
UNR	-0.201613**	0.0250	0.199****	-3.290836**	0.0169	0.199****
AGR	-0.215405***	0.0772	0.446****	-3.088237***	0.0963	0.446****
DGR	0.227475**	0.0449	0.487****	3.498161**	0.0433	0.487****
AMS	0.304658*	0.0047	0.268****	4.609364*	0.0051	0.268****
Included observations	55			55		
R-squared	0.329592			0.345134		
Durbin-Watson stat	1.735602*****			1.909989*****		
S.E. of regression	0.019420			0.296314		
Sum squared resid	0.018479			4.302292		
F-statistic	4.817960			5.164888		
Prob(F-statistic)	0.001163			0.000696		
White Heteroskedasticity Test						
F-statistic	1.397886			1.467258		
Prob(F-statistic)	0.213011*****			0.184128*****		

*Statistically significant at 1%

** Statistically significant at 5%

*** Statistically significant at 10%

**** Reject multicollinearity for tolerance above 0.1

***** Reject Ho for autocorrelation

***** Reject Ho for heteroskedasticity

Table 3: Empirical results for the period 2001Q1 – 2011Q1

2001 Q1 - 2011 Q1						
	3			4		
	ROA			ROE		
Independent variable	coefficient	p-value	collinearity - test	coefficient	p-value	collinearity - test
constant	0.018450	0.1486		0.267580	0.2406	
GDP	0.049720***	0.0943	0.249****	0.719186	0.1744	0.249****
UNR	-0.120491***	0.0910	0.339****	-2.000741	0.1168	0.339****
DGR	0.060398**	0.0350	0.801****	1.001610***	0.0503	0.801****
AMS	0.182067*	0.0054	0.242****	3.225712*	0.0060	0.242****
DMS	-0.185655**	0.0294	0.234****	-3.012424**	0.0476	0.234****
Included observations	41			41		
R-squared	0.596986			0.541423		
Durbin-Watson stat	1.827426*****			1.550128*****		
S.E. of regression	0.004170			0.074824		
Sum squared resid	0.000609			0.195954		
F-statistic	10.36911			8.264617		
Prob(F-statistic)	0.000004			0.000031		
White Heteroskedasticity Test						
F-statistic	0.926922			0.867225		
Prob(F-statistic)	0.522797*****			0.572181*****		

*Statistically significant at 1%

** Statistically significant at 5%

*** Statistically significant at 10%

**** Reject multicollinearity for tolerance above 0.1

***** Reject Ho for autocorrelation

***** Reject Ho for heteroskedasticity

4.1 Interpretation of the regression results

The empirical results suggest that macroeconomic forces and industry related features actually affect bank profitability in line with prior expectations. Referring to the macroeconomic indicators the growth rate of GDP has a positive and significant effect on bank profitability. This result is related to the fact that higher growth in the economy on the one hand enables banks to lend to a greater degree and charge higher margins as well. On the other hand, the quality of their loan portfolio, and hence their assets as a whole, is improved (Athanasoglou *et al.*, 2006). The positive coefficient of GDP growth implies that the bank's potential capacity to generate profits is more likely to improve during economic upswings rather than on depressions. This outcome is in line with the results of those of Dietrich and Wanzenried (2014), Kosmidou (2008) and Trujillo-Ponce (2013). In accordance to the results of Pouw and Kakes (2013), Kosmidou and Pasiouras (2007) and Jureviciene and Doftartaitė (2013) the regression results show that the unemployment rate negatively and significantly influences bank profitability. This result has also been expected since bank customers' ability to proceed to loan payback, or engage in any new financial services is negatively affected by high unemployment rates (Bolt *et al.*, 2012; Messai and Jouini, 2013), whereas during periods of high unemployment banks are also reluctant to proceed into granting new loans. On top of that, following Bolt *et al.* (2012) another possible explanation for this result is that unemployment is a restrictive factor for banks when evaluating a new loan.

Turning to the industry-specific determinants the empirical results provide evidence that they also affect bank profitability. The effect of the bank's market share, on its profitability depends on which independent variable is considered. Firstly, the bank's market share in terms of assets has a positive and statistically significant effect on bank profitability. This result is in alignment with Mizraei *et al.* (2013), who contend that a higher market share in terms of assets implies that the bank is able to impose higher prices for its products and services, whereas it can also be related to the fact that customers are likely to be more attracted by banks which possess larger market shares (Kuzma and Shanklin, 1992). On the contrary, the bank's market share in terms of deposits negatively affects bank profitability. Actually, this outcome is statistically significant merely when the examined period is from the first quarter of 2011 to the first one of 2011, but insignificant although still negative for the whole period from the first quarter of 2001 to the third one of 2014. Deposits are a costlier way of funding assets in comparison to other forms of funding such as inter-banking borrowing, borrowing from the European Central Bank or direct funding from sources such as the international monetary and capital markets. However, during the past few years, Greek banks, due to Greece's financial situation, were excluded from the financial markets and had to turn more on customer deposits. Therefore, the profitability of a bank which heavily relies on deposits in order to fund its assets is negatively affected by the deposits market share (Lekkos *et al.*, 2010; Growe *et al.*, 2014).

With regards to the market growth of the banking industry, its impact on bank profitability also depends on the feature that is examined. As far as the growth rate of the market's total assets is concerned, the study has revealed a negative and statistically significant impact on bank profitability, when the period under examination was from the first quarter of 2001 to the third one of 2014. The effect was still negative but insignificant when the period of the deep financial distress, from the second quarter of 2011 onwards, was not included. Following Apergis (2009) this result is explained considering that a rapidly growing market might insinuate hazardous lending, which means that the quality of assets itself is not able to result into the expected profitability that their increase should otherwise entail. Furthermore, a fast growing market can inflict increasing labor and building costs and advertising expenses, for the individual banks, which consecutively negatively affect bank profitability. Nevertheless, this regression result deviates from the findings of Mizraei *et al.* (2013). Finally, the study has revealed that the growth rate of the market's total deposits positively and significantly influences Greek bank profitability. These results are in accordance to those of Pillof and Rhoades (2002). A possible explanation that this might happen is that the bank takes advantage of the growing market, and despite the fact that deposits are a more expensive source of funding (Lekkos *et al.*, 2010) due to the Greek banks' restricted access to other forms of funding, it manages to convert deposits into profit yielding assets (Dietrich and Wanzenried, 2011).

5. Conclusions and further research

This paper specified an empirical framework which investigates how various macroeconomic forces and banking industry related attributes influence the ability of Greek banks to produce profits. In order to explore the explanatory power of the selected factors on Greek bank profitability over the period 2001 - 2014 one out of the four systemic banks was chosen. With the means of the ordinary least squares method, linear multiple regression models were developed. Firstly, in order to explore the impact of the macroeconomic environment on the profitability of a Greek bank two fundamental constructs, namely growth rate of gross domestic product and unemployment rate were investigated. Secondly, in order to study the effect of the industry structure on the profitability of a Greek bank four factors, namely the deposits market share, the assets market share, the growth rate of the industry's total deposits and the growth rate of the industry's total assets, were examined. Moreover, to account for the recent financial crisis two periods of time were separately examined; the first one from the first quarter of 2001 to the third quarter of 2014 and the second one from the first quarter of 2001 to the first quarter of 2011.

Overall the empirical results provide evidence regarding the mechanism that determines profitability in the Greek banking sector. In brief, the study revealed that Greek bank profitability is shaped by both macroeconomic and industry-specific factors. As far as the macroeconomic factors are concerned, the study provided evidence that unemployment rate has a negative effect on bank profitability while GDP growth has a positive impact on that profitability. Moving to the industry structure related factors, on the one hand, the rate of growth of the industry's deposits and the bank's assets market share positively affect bank profitability. On the other hand, the rate of growth of the industry's assets and the bank's deposits market share negatively influence bank profitability.

The conclusions drawn could prove to be useful in the Greek banks decision process regarding strategy formulation and implementation. In addition, the findings of the current study have also considerable policy relevance. The influence of various external environment factors on bank profitability has been examined over a long period including the recent financial crisis, whereas, the empirical findings confirm the results from previous studies on bank profitability, as well. Understanding the way that bank profitability is shaped by macroeconomic and industry related variables enables bank managers, bank regulators and monetary authorities as well to design, develop and impose the necessary buffer instruments towards the stability of the whole financial sector.

Finally, the study has been conducted under certain limitations which however could be the ground for further future research. A first limitation regards the small sample size which is ought to the particular peculiarities of the Greek banking sector. Future further research can overcome this limitation by utilizing a larger sample which will include more banks from various either Eurozone countries or Balkan countries. Furthermore, this paper has studied how macroeconomic and industry related features determine bank profitability. The inclusion in future studies of bank specific factors and attributes such as the effect of certain political decisions or interventions, on the one hand, and the impact of mergers and acquisitions or even information regarding the banks' upper management and board members, on the other hand, might result into discovering new paths of bank profitability.

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Multi-Level governance concept - complementary role of State in the European Union Economies of the 21st Century

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ABSTRACT

Purpose - the aim of proposed article is to present the multi-level governance concept and attempt to determine the role of public authorities in the Economies. The issues concerning the role of State in the Economies of the 21st Century and what is more also local government, its location in the external environment, with particular emphasis on the decentralization processes and the ongoing European integration is a very interesting subject of economic and social research.

Design/methodology/approach - there has been an extensive literature review on complementary role of State in Economy and EU regional policy, multi-level and territorial governance concept. Elements of the Polish approach were used as well.

Findings - The application of ITI and CLLD mechanisms in European policy is an example of the MLG model in the management and spending of EU funds on the regional level. The example goes to show that the move towards coordinated action and decision-making that involves not only local and regional authorities but also local action groups, social and non-governmental organizations, is irreversible.

Research limitation/ implications - the proposed topic contributes to the debate on the future of the European Union role of State in Economy and on the cohesion policy in the ongoing programming period. The objectives which are necessary to complement the ongoing research include: identifying barriers and key instruments to support local economic and social development, identifying the role of local authorities and areas of cooperation between the different actors i.e. State, NGO's, entrepreneurs and others market participants.

Originality/value – The new challenges faced by the countries of the European Union: globalization, demographic problems and the aging population, migration of people, as well as the latest economic crisis and the problems of public finance imbalance in many Member States, raise questions about the long-term future of the European Union. One of these questions is the place and role of State and local authorities in the implementation of strategic goals.

Key words: *governance, self-government, public sector, authorities, local development*

JEL classification codes: H77, R58, P25

1. Introduction

To meet all requirements posed by the progress of civilization and increased competition in the economic, social and cultural spheres, calls for selecting appropriate - territorial - policy aimed also at attaining the objectives of the Europe 2020 strategy. The need for development policy territorialisation was indicated in the Territorial Agenda adopted in 2011 in Gödöllő, where it was pointed out that the successful implementation of the Europe 2020 strategy depended on taking into account its territorial dimension. The territorialisation in such terms can be understood in two ways: the first is the coordination of policies and differentiation in space, the second is the use of specific, territory-relevant capital, which according to the concept of R. Camagni, should be stimulated by local authorities. This justifies the need to present Multi-level governance concept as a possible way to define the role of State (or wider: public authorities) in the Economies of the 21st Century.

What is more the proposed topic includes attempt to define the role of local authorities in local Economies. In connection with the change of approach pursued at the European regional policy level, local governments have become an essential element of effective regional policy. The concept of public authorities departs from linear hierarchies, based on the leading role of national (central) authorities, towards horizontal co-operation and networking, both at the institutional level, as well as at the economic and social level. Local action groups, NGOs, local governments, have become important actors that constitute an important link in the cohesion policy. Their successful connection and inclusion in the achievement of the Europe 2020 strategy objectives have become the basis for a new approach to regional policy aimed at stimulating the inner potential - both economic, social and cultural. Cooperation between such many market participants is core meaning of multi-level governance concept.

2. Complementary role of State in the European Union Regional Policy

One of the most marked changes in the approach to regional politics has been the move away from the dominant role of the state; as noted by I. Pietrzyk, the latter has lost its undivided monopoly on power and become a partner for territorial governments, social and economic entities, and other institutions, including those with an international reach (Pietrzyk, 2000). I. Pietrzyk quotes a vivid formulation by R. Prud'homme (1995), who argues that the state is no longer a soloist but a conductor, responsible for stimulating and coordinating the activity of other players. In the wake of administrative decentralization and the emergence of territorial government interventionism, claims Pietrzyk (2000), a key role in regional politics is now being played by territorial authorities; these seem to be the best placed to channel local energy and define the place of the region in the national and European context. As remarked by A. Jewtuchowicz (2005), local economy is an open economy and the state can only have a complementary role to play in this area: it initiates a number of

mechanisms necessary to mobilize local communities. European integration is a complex process that involves member states with separate, often very distinct organizational structures and literature on the subject has long debated the role and place of the nation-state in the political, economic, social, and cultural system. The prophets of globalization, as noted by M. Keating (2004), tend to put an emphasis on the decline of the nation-state due to the mobility of capital and technology, the rise of transnational corporations, trade, and the emergence of international regimes. Others, such as F. Fukuyama (1992), maintain that there is no single binding economic model or political organization in the world today and prefer to speak of the end of history. M. Keating (2004) observes that globalization has given a new meaning to all these ideas, since it involves a change in the role of the state. States seem to be losing authority to supranational regimes, and, at the same time, are being undermined by new cultural, social, and political movements, both at the local and the regional level. According to some, these tendencies stand in stark contradiction to each other, relying on radically distinct forms of regulation and spatial scale; nowadays, however, they are also increasingly thought of as complementary.

Europe has been locked in a debate over its community management model, because the multiplicity of legal regulations, customs laws, decision-making procedures, and the institutional system require adequate cooperation mechanisms, organized in such a way as to bring maximum effects consistent with declared objectives. This outcome could be achieved, for instance, if the EU chose to communitarize all its activities within the integration process and discard the intergovernmental model, which would basically imply full integration within a political union. While such a solution may seem attractive in terms of decision-making and efficiency of action, it is unlikely to ever be accepted by member states. A more realistic solution is to be found in the *multi-level governance (MLG)* model, based on a basic assumption that the EU is composed of multiple centers and decision-making entities that form a “management network” and need to cooperate with one another. The MLG approach does not exclude the nation-state from the decision-making process, nor does it threaten its role; rather, it calls for the cooperation between individual levels of public authority, recognizing the state as the fundamental actor in the integration process.

3. *Multi-level and territorial governance – discussion and implications*

Literature on territorial development frequently brings up the concept of multi-level governance, first laid out in the White Paper of the European Commission on European Governance released in 2001 (COM, 2001). The fact that the White Paper of the Committee of the Regions published eight years later and the subsequent special opinion of the Committee (CoR, 2011) continue to mention the idea as a postulate illustrates how difficult it is to put into practice (CoR, 2009). On 3 April 2014, to advance this goal, the Committee of the Regions adopted (in the form of a resolution)

a Charter For Multi-Level Governance in Europe, in which it proposes and encourages various levels of administration to implement the MLG model (CoR, 2014).

While the term “multi-level” is easily understood, “governance” seems difficult to interpret in an unambiguous way. It derives its origin from the word “government”, which automatically suggest that we are dealing with an attribute of power, but in a broader sense than its etymology would suggest. In a definition proposed by J. Kooiman (1993), the concept is understood as a model of action or a structure that emerges within the sociopolitical system as a result or consequence of the interacting interventions undertaken by all its active participants. In contrast to *government*, *governance* is thus by its very nature interactive and cannot remain the sole province of a government or sovereign power broadly understood. *Governance* implies power-sharing between a number of various entities. However, because the author of the above definition gives *governance* a markedly social tinge, the concept also seems to approximate that of *coordination* (Hausner, 2008). *Governance*, as noted by A. Jewtuchowicz (2005), is related to intermediary forms of regulation, neither purely public, nor purely market-based. It encompasses all the aspects of the activity of involved actors in the economic, social, and political realm, and contributes to articulating private interestes as well as the essence of the public good. The participation of institutions, and in particular local public institutions, guarantees a balance between economic efficiency and the sense of social justice. Literature on the subject has discussed this concept extensively both in the context of public power and enterprise management (Jewtuchowicz, 2005; Hausner, 2008; Rudolf, 2010; Frederickson and Smith, 2002; Heinrich and Lynn 2000); the idea of an *open method of coordination* in EU politics is also often brought up, as disscussed by A. Benz (2007) and A. Faludi (2004).

The present article approaches the concept of multi-level governance (MLG) from the perspective of territorial cohesion policy. As noted by A. Faludi (2012), the notion first emerged during a gradual turn towards governance that occurred in European scholarship in the 1980s. Scholars realized that practice does not fit the formal relationships between various levels posited by integration theory. The observation was also supported by research into European spatial planning, where the term *multi-level territorial governance* first appeared. Faludi notes, importantly, that the qualification “territorial” is redundant in this case since the MLG model is such by its very nature, as evidenced by official EU documents: the adjective appears in the “Green Paper on Territorial Cohesion”, but is markedly absent from the “Territorial Agenda of the European Union 2020”.

In the “White Paper on Multi-Level Governance” (CoR, 2009) published by the Committee of the Regions, the concept is defined as the coordination of actions taken by the European Union (or its institutions), member states, and local and regional authorities, based on the principle of partnership and aimed at creating and implementing EU policies. Such co-governance requires a

division of powers among various levels of public authority and their participation in the process of formulating EU law and policy through various mechanisms such as consultations, territorial impact analyses, etc. Further sections of the White Paper specify that multi-level governance is a dynamic process both in the horizontal and the vertical dimension, and in no way aims to diffuse responsibility; to the contrary, it means to help improve policy implementation and increase the sense of co-ownership, provided, however, that all mechanisms and instruments are employed in an appropriate manner. Such mechanisms, according to the Committee, include subsuming local and regional government objectives under a broader EU strategy, strengthening the prerogatives of local and regional governments at the national level, and encouraging them to participate in the coordination of community policies. As noted by A. Faludi (2012), there is nothing wrong with such an approach, especially that the chief role of the Committee of Regions is to defend the rights of local and regional governments; he wonders, however, whether the term should be restricted to multi-level political governance or whether it could also be applied, as suggested by M. Bevir, to the social sphere and existing norms and paradigms, as well as practices and dilemmas that put a lesser emphasis on hierarchy and statehood. In his reflections, A. Faludi (2012) quotes L. Hooghe and G. Marks (2010), who discuss two distinct types of *Multi-Level Governance*:

- MLG Type 1 refers to decentralized governance,
- MLG Type 2 relies on crucial agreements and jurisdictions of various entities.

The first type refers to the governance level, since, as noted by L. Hooghe and G. Marks, formal authority is being delegated from the central level both upwards, to supranational bodies, and downwards, to local and regional authorities. The concept does not account for the important role of non-governmental actors and the boundaries of authority between various levels do not overlap. This is why this MLG model has been compared to a Russian matryoshka doll, in which each little doll can be considered independent but continues to occupy a strictly defined position in the hierarchy (Faludi, 2012).

The second MLG type refers to overlapping *specialised jurisdictions* that obtain on a broad scale and are potentially high in number. Jurisdictions discussed by L. Hooghe and G. Marks are generally thin and flexible and relate to specific cases, while the boundaries between involved entities often intersect. Relevant sectors include, for instance, transport, education, and healthcare, where it is often necessary to arrive at crucial agreements. Even though there is a greater emphasis on the relationship between specialized agencies than on the involvement of civil society in the decision-making process, it is clear that the relationships between them are less formalized than in the case of the “Russian matryoshka”. This form of multi-level governance is thus related to the diffusion of decision-making, which is a more characteristic feature of *governance* (Faludi, 2012).

The best example of multi-level governance in practice, according to S. Piattoni (2009), is the empowerment of European regions and their active involvement in cohesion policy. However, until the latter have emancipated themselves from the supervision of central authority and gained complete freedom to act, there can be no real talk of “Europe of the regions”. At this juncture, S. Piattoni quotes L. Hooghe and G. Marks, who explain that the MLG model does not lend support to the scenario of “Europe of the regions” but rather to that of “Europe *with* the regions”. She maintains that the concept is sufficiently flexible to contain various national legal orders, institutional practices, and political cultures, but also sufficiently remote to create problems for all of those. In sum, however, she takes a positive view of multi-level governance as a way to democratize the European Union and lists the following advantages of the model: 1) including peripheral regions in decision-making processes that directly affect them; 2) creating loose connections to avoid stalemates related to the exercise of veto power in the last phase of decision-making; 3) supporting the creation of more relationships between territorial authorities and their constituencies (Piattoni, 2009).

In an attempt to transplant the MLG approach onto the Polish soil, M.W. Kozak (2013) notes that principal factors favoring the MLG model include those related to growth and the demands on public policy under the twin conditions of internationalization and globalization. On the one hand, the demands on administration grow, on the other, we witness a diffusion of models borrowed from other countries and the development of both public functions and social expectations expressed by ever more diverse communities. This creates a certain pressure on public administration; its nature and reception, however, can vary depending on the wealth and competences of individual local, regional, and national areas. In an attempt to determine whether the MLG model can be implemented in the Polish context, M.W. Kozak lists a number of important trends that favor changes in administrative structure and organization, including: 1) deregulation and freeing up social and economic reserves; 2) supporting the processes of cooperation and partnership in carrying out public functions on the local, regional, national, and supranational level; 3) changes in the structures of the redistributive role of the state; 4) digitization of the administration and facilitating the contact of citizens and companies with public officials (Kozak, 2013).

While the concept of *multi-level governance* refers to the macro-level and is understood by many scholars as multi-level government, on the micro-scale, it is also possible to discuss *territorial governance* or, in the case of city politics, *urban governance*. Both of these concepts refer to management on local and regional levels. *Territorial governance*, understood as territorial co-governance, and *urban governance*, interpreted as urban co-governance, meet the criteria of the second MLG type, as outlined in the approach proposed by L. Hooghe and G. Marks.

A broader view of *governance* requires that the decision-making process should bring together participants or players with heterogeneous interests and preferences, representatives of various interest groups and associations or organizations with different views and objectives. As noted by A. Torre (2014), this has become the central element of local development processes, focused on benefits from coordination, interaction, joint action, empowerment, and mutual learning, with a special emphasis on participation and consultation. Territorial co-governance can thus be defined as a set of processes and mechanisms employed by diverse parties or actors (the production sector, associations, public personalities, representatives of public or local authorities, etc.) in order to contribute, through dialogue or conflict, to joint projects aimed at the future development of their respective territories (Torre and Traversac, 2011). *Territorial co-governance* in this sense makes it possible to argue that an important role in regional development is now played by local authorities and that their ability to rise to the challenge will determine the final outcome of the process, i.e. decide if local capital will be tapped successfully or the region in question will fall into the underdevelopment trap.

4. The role of self-government in development policy

As suggested by our discussion thus far, there is a broad consensus on the important role of local and regional authorities in achieving the strategic objectives of economic development. The same holds true for community goals, as evidenced by the *Europe 2020* strategy (COM, 2010), which argues that the ongoing dialogue between various levels of national administration helps bring EU priorities closer to the people and increases involvement levels necessary for the successful implementation of strategic objectives. As noted by M. Guderjan (2012), however, even though territorial authorities have great ambitions in this respect, there has been little practical effort to implement the goals in question in the framework of cooperation between national, regional, and local authorities. Both the Lisbon Strategy and *Europe 2020* have come under fire for their top-down character and failure to account for the role of territorial governments. The latter's involvement in achieving strategic EU objectives primarily requires cooperation on the national level, which, as noted by the Committee of the Regions (and the CEMR), has had a checkered track record. The Committee has thus called on member state governments to increase cooperation and form a permanent partnership. Accordingly, it is no longer merely the question of Europeanizing territorial governments; EU policies also need to be municipalized.

4.1. Multi-level governance in the practice of European cohesion policy

In December 2013, the Council of the European Union approved new laws and provisions concerning the next round of investment in the framework of the EU cohesion policy for 2014-2020, meant, for the first time, to apply to all funds. A Regulation of the Council of the European Union (EU, 2013, Art. 32, Ch. 2) reaffirmed the territorial dimension of cohesion policy by introducing a new instrument, *Integrated Territorial Investment (ITI)*, and the concept of *Community Led Local*

Development (CLLD). ITI is designed to help implement territorial strategies in an integrated manner. It is neither an action, nor a subpriority, of any single operational program, but allows member states to implement operational programs across the board and receive funding from various priority axes, which ensures well-integrated strategy implementation throughout a given territory. It must be emphasized that ITI can only be used effectively if a given geographical area has formulated an integrated intersectoral territorial strategy. The basic elements of ITI include:

- defining the territory and an integrated strategy of territorial development,
- a set of measures to be implemented,
- the principles of ITI.

In turn, as defined by art. 32 of the Regulation, community-led local development should take account of local needs and potential, as well as crucial social and cultural features. The responsibility for drafting and implementing CLLD rests with local action groups (LAGs) that represent various community interests (EU, 2013, art. 31). The CEMR judged it to be a good step forward, and ITI and CLLD have become an important element in the territorialization of cohesion policy (CEMR, 2013). Partnership Agreements that member states sign with the European Commission, explicitly mention CLLD and ITI as instruments of territorial development. CLLD allows local communities to initiate and implement development measures in a participatory manner, through local action groups active in a given territory, as well as to draft and realize local development strategies. CLLD is a new instrument within cohesion policy and it is not obligatory. It does, however, merit particular attention due to its participatory nature, reflected in the involvement of local communities and partners (governments, businesses, and the NGO sector) in creating and carrying out local development strategies. Partnership Agreements typically provide for solutions to support the implementation of CLLD within the framework of cohesion policy. According to the provisions of the Polish PA, CLLD is designed to improve social and territorial cohesion, enhance the mobilization of potential on the local level, and increase social participation and active citizenship in the country. It is worth noting that actions taken in the framework of CLLD should complement, rather than replace, those taken by local authorities, and the scope of support should be specified within individual programs based on relevant analyses and evaluations.

On the other hand, the Polish agreement defines ITI as an instrument intended to realize specific territorial strategies. In Poland, it is specifically designed to integrate actions aimed at developing urban centers and their associated functional areas; this requirement is obligatory for voivodeship towns, and discretionary for regional and sub-regional centers. In accordance with the Polish partnership agreement, integrated territorial investment serves to:

- promote a partnership-based model of cooperation between various administrative bodies in urban functional areas,
- increase the effectiveness of interventions by realizing integrated projects that comprehensively address the needs and issues of towns and associated functional areas,
- boost the influence of town centers and associated functional areas on the kind and implementation method of supporting actions in the framework of cohesion policy in their respective territory.

5. Findings

ITI funds can be mobilized subject to two important conditions: the presence of an institutionalized partnership (establishment of ITI associations) and the development of an ITI strategy. The former can include associations between communes and provinces; associations formed by territorial government bodies; as well as agreements between communes or companies established by territorial government bodies. A Noworól (2013) argues that these instruments designed to support local development in rural and urban areas illustrate a new approach to regional policy. They will require programming and analysis on a scale that cannot be mapped to traditional administrative borders and their management model will require the interaction of public, economic, and social factors. As a consequence of the new, territorial approach and the “imposed co-existence” of various local actors, there has emerged a new model of territorial planning within a structure of partnership networks between hybrid public, social, and private entities (Noworól 2013). The application of ITI and CLLD mechanisms in European policy is an example of the MLG model in the management and spending of EU funds on the regional level. The example goes to show that the move towards coordinated action and decision-making that involves not only local and regional authorities but also local action groups, social and non-governmental organizations, is irreversible. It proves the changing role of the state in 21st-century economy and development policy. As indicated earlier, the state is no longer a soloist, but a conductor, as well as coordinator and animator, of actions taken on the local and regional level, responsible for creating networks and tapping the local potential for the purposes of a better development policy.

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“Neoclassical and technological catching-up as the channels of the convergence process in the European Union”

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Abstract

The key determinant of the real convergence process in the European Union is undoubtedly β - convergence process. The theoretical foundations of the idea that poorer countries catch-up with the rich ones derive from two alternative types of approach: neoclassical convergence and technological catching-up. The aim of the paper is to investigate β - convergence process between European Union member states in the period 2000-2014 and identify channels of that process. The paper attempts to give the answer whether the investigated group of countries experienced convergence process because of capital accumulation, technological catching-up or both mechanisms together. The framework used to test the relative strength of neoclassical and technological catching-up as convergence driving forces combines the neoclassical and endogenous representations of the economic growth process. The tests are conducted with the use of cross-sectional as well as panel data analysis including the proper methods of estimation.

The obtained results confirmed that both channels of convergence: neoclassical and technological occurred in the group of 27 EU members. Moreover, the technological mechanism seemed to be more important than the neoclassical one. The mentioned phenomenon was particularly visible between the “new” EU countries. In general, one may conclude that the technological channel, not capital accumulation, is the driving force of the converge process in the European Union. The more intensive technological catching-up process, the higher the speed of β - convergence.

Introduction

Economic convergence is one of the main goals of the European Union integration process, referred to in all the EU treaties. Article 174 of the Treaty of Lisbon states that “The Community shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions...” (EU Treaty of Lisbon, 2007). After 2004, a vast group of less developed Central and Eastern European countries started their integration process with relatively richer Western European countries. In the last 12 years, GDP per capita disparities between the EU member states have decreased, in other words, σ - convergence has occurred. The key determinant of that process was undoubtedly the β - convergence process - the fact that the growth in GDP per capita has been on average higher in poorer than in richer UE member states. The existence of a negative relationship between the initial GDP per worker and the pace of economic growth is a phenomenon confirmed in the majority of empirical studies of the convergence process in the European Union (e.g. Schadler, Mody, Abiad and Leigh (2006); Halmai and Vásáry (2010); Tatomir and Alexe (2011); Stašić (2012); Grzelak and Kujaczyńska (2013); Rapacki and Próchniak (2014)).

The theoretical foundations of the idea that poorer countries catch-up with the rich ones derive from two alternative types of approach: neoclassical convergence (capital deepening) and technological catching-up. Neoclassical catching-up refers to the Solow-Swan growth model (1957). Its central hypothesis is that diminishing returns to investment (decreasing marginal productivity of capital) cause the growth rate of a country to decrease as it approaches its steady state. It implies that richer economies (with shorter distance from the common steady-state) grow slower than poorer ones. The major aspect of that approach is to assume that all countries implement technology at the same rate. Consequently, it means that all the differences in country growth rates depend on countries' distances from the common steady-state and their rate of decrease of returns to capital.

On the other hand, the technological catching-up approach suggest that a catching-up process should occur because poorer countries (followers) have capabilities to easily imitate and adopt technology of more advanced countries (leaders). This approach starts from the assumption of different technology levels and growth rates between countries. That alternative stream in convergence literature initially developed by Abramovitz (1986), Baumol (1986), Dowrick and Nguyen (1989) and then introduced in endogenous growth models of Romer (1990), Aghion and Howitt (1998), Howitt (2000), focuses on the fact that poor countries face a huge technology gap and, subject to their absorptive capabilities, can grow faster. Convergence tendencies arise because, although innovation tends to increase productivity and technological differences between countries, diffusion of technology tends to decrease them.

Despite the significant difference in assumptions between the two convergence mechanisms, it is difficult to empirically separate technological progress from capital deepening. In literature, the empirical tests about two alternative channels of convergence have often been conducted by means of the same econometric specification. In standard growth regressions, the initial level of GDP per capita used as explanatory variable may be interpreted both as a proxy for the level of capital (the distance of a country from its steady-state) and as a proxy for the level of technology (technological gap) in economy. Thus, it's not clear how much of the convergence is due to technology diffusion rather than capital deepening of poorer countries. The necessity of solving that problem was noticed by Stockey (1994) and Temple (1999). However, the seminal approach to separately test the two possible convergence mechanisms was introduced by Rogers and Dowrick (2002). An alternative method to study these aspects was also proposed by Wong (2007) and Feyrer (2007).

The aim of the paper is to investigate β -convergence between European Union member states in the period 2000-2014 and identify channels of that process. The paper attempts to give the answer whether the investigated group of countries experienced convergence process because of capital accumulation, technological catching-up or both mechanisms together. The framework used to test the relative strength of neoclassical and technological catching-up as convergence driving forces in European Union countries combines the neoclassical and endogenous representations of the economic growth process. The hypothesis of a common technology growth (from Solow's model) is mitigated and the technological catching-up hypothesis is adopted. The survey is based both on a theoretical model and empirical specification considering the two mentioned mechanisms.

The paper is organised as follows. The second part concerns the methodology of identifying convergence mechanisms from a theoretical and empirical point of view. In section 3, the data sources are presented, particularly the methodology of capital per worker and TFP calculation is explained. In section 4, the empirical evidence regarding the convergence process between the EU members (UE-27, UE-15 and UE-12 groups) is provided. Section 5 shows the results of tests for the importance of neoclassical and technological catching-up as the channels of the convergence process between the EU member states. Additionally, productivity convergence between the EU members (the relation between the initial levels of TFP and TFP growth) is investigated. The last part of the paper is the conclusion.

1. Neoclassical and technological catching-up: theoretical framework and empirical specification

The production function in closed economy can be written as the Cobb-Douglass function:

$$Y_{it} = A_t K_{it}^{\alpha} L_{it}^{1-\alpha} \quad (1)$$

where Y_{it} is the output, A_t the level of technology (Total Factor Productivity level), K_{it} capital stock and L_{it} labour resources in country i , at time t . α is the output elasticity of capital, equal to the capital share of income under the assumption that production factors are paid their marginal product. Assuming constant returns to scale, and after dividing the both sides of the previous equation by labour input, it can be transformed into the following:

$$y_{it} = A_t k_{it}^{\alpha} \quad (2)$$

where y_{it} is the output per worker and k_{it} capital per worker of country i .

According to Solow's model, capital stock is accumulated at a fixed rate s_i and depreciates through time at a common rate δ , labour grows at a constant rate n_i . Under above assumptions, capital accumulation in country i can be described by the following dynamic equation:

$$\dot{k}_{it} = s_i y_{it} - (n_i + \delta) k_{it} \quad (3)$$

where the dot notation denotes the derivative of the capital stock with respect to time.

In the neoclassical model, a common country technology growth rate g is assumed, where:

$$A_t = A_0 e^{gt} \quad (4)$$

Differently, one assumes that the technology growth rate is different in particular countries, thus:

$$A_{it} = A_0 e^{g_i t} \quad (5)$$

The assumption about different technology growth rates g_i is essential in the situation when the technological catching-up process is going to be considered. The technological catching-up approach is connected with the existence of a technological leader and followers and technology

transfer between them. According to Dowrick and Rogers's (2002) specification, technology transfer increases technical progress of a follower in direct proportion to the logarithm of the technological gap at the beginning of the period. Thus, technological progress of country i can be described by the following formula:

$$g_i = \theta + \varphi \ln \left(\frac{A_o^L}{A_{io}} \right) \quad (6)$$

Coefficient θ is a constant term reflecting the country-specific determinants of technological progress (e.g. institutions, policies influencing domestic rate of innovation). A^L is the highest value of A in the group of economies under examination (in the initial year of the analysed period), in other words, it is the level of technology of the lead country. Coefficient φ can be interpreted as the speed of technology diffusion due to the technological gap between the leader and follower country i .

Substituting equation (5) into (2), then differentiating it with respect of time and finally dividing it by y_{it} one obtained:

$$\frac{\dot{y}_{it}}{y_{it}} = \alpha \frac{\dot{k}_{it}}{k_{it}} + g_i \quad (7)$$

Then, substituting formula (6) into (7) one gets the following equation:

$$\frac{\dot{y}_{it}}{y_{it}} = \alpha \frac{\dot{k}_{it}}{k_{it}} + \left(\theta + \varphi \ln \left(\frac{A_o^L}{A_{io}} \right) \right) \quad (8)$$

Equation 8 represents two different catching-up channels. The first term on the right-hand side reflects the influence of capital accumulation on the growth in output in economy. Taking into account decreasing returns to capital and equation 3 showing that capital accumulation is higher in poorer countries, we can draw the conclusion that poorer countries, with a lower level of capital per head, can grow faster than richer ones. Thus, the neoclassical catching-up process appears.

The second term in the mentioned equation represents the influence of the technological gap on GDP per worker growth in the economy. The greater the technological gap between the leader and the follower, the higher the output growth in the follower country. In other words, an economy with a lower initial level of technology grows faster because the technological catching-up process

occurs. Of course, the role of both mentioned channels in boosting the pace of particular countries' economic growth can be differentiated. Furthermore, they can work separately or together.

The above theoretical background is useful for building a proper econometric specification in order to conduct an empirical analysis concerning the comparison of the importance of neoclassical and technological catching-up in the convergence process between EU member states. Following Bianchi and Menegatti (2005) approach, the role of the neoclassical and technological convergence mechanisms can be tested with the use of two different econometric specifications.

The first one combines a modified β -convergence equation (in which output is regressed on the initial level of output) and a model based on the traditional decomposition of economic growth (where growth in output is decomposed into contributions due to the growth in capital and technological progress).

The simplest absolute β -convergence test provided by Barro (1991) investigates the cross-country relation between the initial level of output per worker and the growth in output per worker in the examined period:

$$\ln\left(\frac{y_{it}}{y_{io}}\right) = \alpha_1 + \beta_1 \ln(y_{io}) + \varepsilon_{it} \quad (9)$$

The negative relation between the initial level of GDP per worker and its growth in the analysed period, reflected in coefficient β , means that poorer countries grow faster and the absolute β -convergence process exists in the analysed group of countries. In the above equation, the catching-up phenomenon is described by the initial level of output as the regressor. In order to distinguish the two types of the catching-up process (neoclassical and technological), a modification of equation (9) incorporating equation (2), (5) and the other theoretical statements is estimated:

$$\ln\left(\frac{y_{it}}{y_{io}}\right) = \alpha_2 + \beta_2 \ln(k_{io}) + \gamma_2 \ln\left(\frac{A_o^L}{A_{io}}\right) + \omega_{it} \quad (10)$$

The negative sign of statistically significant β_2 coefficient associated with the logarithm of initial capital per worker indicates that poorer countries in the analysed group exhibit faster growth in GDP per worker. It confirms that neoclassical capital deepening is a significant channel of convergence in the investigated group of countries.

The positive sign of statistically significant γ_2 coefficient associated with the logarithm of the technological gap (measured as the distance between initial A (TFP) level of country i and technology level of the lead country in the group) indicates that less developed countries, with a huge technological gap, converge to richer ones because they improve their technological level much faster due to technology transfer and imitation. It confirms that technological catching-up occurs as an important channel of the convergence process.

The above econometric specification called “informal growth regression” is the most popular technique used to study sources of economic growth in empirical surveys. However, the modified β -convergence regression including a group of variables affecting growth is not a direct consequence of the theoretical model (8). Taking into account the solution proposed by Dowrick and Rogers (2002) as well as Bianchi and Menegatti’s (2005) approach, the growth rate decomposition regression can be constructed and estimated. A modification of equation (2) so that $\ln(y_t/y_0)$ on the left-hand side is obtained and including equation (5) (with the assumption that the average growth rate of A is substituted by the total growth of technology in the analysed period) results in the following formula:

$$\ln\left(\frac{y_{it}}{y_{io}}\right) = \alpha \ln\left(\frac{k_{it}}{k_{io}}\right) + \left(\theta + \varphi \ln\left(\frac{A_o^L}{A_{io}}\right)\right) \quad (11)$$

Finally, the neoclassical and technological channels of convergence can be investigated by estimating the following econometric model:

$$\ln\left(\frac{y_{it}}{y_{io}}\right) = \alpha_3 + \beta_3 \ln\left(\frac{k_{it}}{k_{io}}\right) + \gamma_3 \ln\left(\frac{A_o^L}{A_{io}}\right) + \vartheta_{it} \quad (12)$$

The positive value of the statistically significant coefficient β_3 indicates that the neoclassical channel of convergence works, as well as positive sign of γ_3 coefficient implies the significant importance of technological catching-up in shaping the convergence process.

2. Data

The dataset used in the empirical surveys includes variables observed at annual intervals in the period 2000-2014 for the group of 27 European Union countries: Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Italy, Luxembourg, the Netherlands, Austria, Portugal, Finland, Sweden, the United Kingdom, Bulgaria, the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Romania, Slovenia and the Slovak Republic. GDP data expressed in

Purchasing Power Parity (Y_{it}) and total labour force data (L_{it}) in the mentioned countries were obtained from the WDI database (World Bank Development Indicators Database).

Direct measures of capital per worker and technology levels in particular countries are used in the analysis. The dataset on the physical capital stocks (K_{it}) as well as the levels of technology-TFP (A_{it}) for all the analysed countries in the period 2000- 2014 are not available in any macroeconomic statistical database. To obtain them, additional calculations and surveys had to be conducted.

Countries' physical capital stocks (K_{it}) in the period 2000-2014 were calculated through Mroczek and Tokarski's (2014) perpetual inventory method. For each of the analysed country, the growth in capital stock can be written as:

$$\Delta K_t = I_t - \delta K_{t-1} \quad (13)$$

where: K_t - capital stock in year t , I_t - total investment flow, $\delta \in (0,1)$ - the rate of depreciation of physical capital, fixed usually at the level of 5%.

Assuming that $\Delta K_t = K_t - K_{t-1}$, the capital stock in time t can be described by the following formula:

$$K_t = I_t + (1 - \delta)K_{t-1} \quad (14)$$

Consequently, it leads to more general relation between the capital stock and the annual value of investment in the economy that can be written as:

$$K_t = \sum_{\tau=0}^{\infty} (1 - \delta)^{\tau} I_{t-\tau} \quad (15)$$

Because the expression $(1-\delta)^{\tau}$ is the element of decreasing geometric progression, and $I_t > I_{t-1}$, thus the expression $(1-\delta)^{\tau} I_{t-\tau}$ is also the element of decreasing geometric series. Under the above assumption, the approximate value of capital stock in a country in time t can be expressed as:

$$K_t = \sum_{\tau=0}^{\infty} (1 - \delta)^{\tau} I_{t-\tau} \approx \sum_{\tau=0}^n (1 - \delta)^{\tau} I_{t-\tau} \quad (16)$$

The longer the time of investment accumulation taken into account (greater number of years n), the more accurate the approximation of the total value of capital stock in time t in economy.

The data on gross fixed capital formation (the measure of annual value of investment I_t) for all the analysed countries in the period 1991-2014 was obtained from the WDI database. It was used in formula (16) to calculate the value of capital stocks in the period 2000-2014. A 10-year period of investment accumulation ($n=9$) and capital depreciation rate δ at the level of 5% were assumed in the formula.

In order to estimate the level of technology A_{it} ("the rest of Solow" or TFP) in the analysed countries, the method applied by Tokarski (2008), which consists in determining the estimation of parameter α on the basis of a two-input Cobb-Douglas function (1), transformed into the following efficiency model was used:

$$\ln\left(\frac{Y_{it}}{L_{it}}\right) = \ln A_0 + g_i t + \alpha \ln\left(\frac{K_{it}}{L_{it}}\right) + \varepsilon_{it} \quad (17)$$

The expression $\ln A_0 + g_i t$ indicates the logarithm of technology level in the analysed country i ($A_{it} = A_0 e^{g_i t}$).

In order to include individual and time effects shaping the level of technology in the particular countries, the proper method of estimation was implemented - the *within* estimator was used. The estimation of model (17) as the *fixed effect model* resulted in obtaining the value of coefficient α (see table 1).

Table 1 Estimation results of model (17): dependent variable $\ln(Y_{it}/L_{it})$; within estimator

Variable	coefficient	stand. error	Student's t	p value
$\ln A_0$	6.18993***	0.156507	39.5505	<0.00001
t_1	0.040283***	0.0147873	2.7242	0.00676
t_2	0.0818278***	0.014813	5.5240	<0.00001
t_3	0.0897239***	0.0149173	6.0148	<0.00001
t_4	0.110245***	0.0151469	7.2784	<0.00001
t_5	0.125412***	0.0154718	8.1058	<0.00001
t_6	0.175903***	0.0159254	11.0455	<0.00001
t_7	0.194165***	0.0167047	11.6234	<0.00001
t_8	0.193465***	0.0175852	11.0016	<0.00001
t_9	0.13693***	0.0180517	7.5854	<0.00001
t_{10}	0.147799***	0.0184573	8.0076	<0.00001

t ₁₁	0.171163***	0.0189445	9.0350	<0.00001
t ₁₂	0.166619***	0.0192125	8.6724	<0.00001
t ₁₃	0.173931***	0.0194137	8.9592	<0.00001
t ₁₄	0.193445***	0.0195435	9.8981	<0.00001
ln(K _{it} /L _{it})	0.413661***	0.01475	28.0448	<0.00001
LSDV R ² (Within ?)	0.987785 (0.935734)			
Number of observations	405			
Model diagnostics	Test for diversification of the constant in groups Null hypothesis H ₀ : groups have a common constant Test statistics: F(26. 363) = 77.4394 p = P(F(26. 363) > 77.4394) = 4.39353e-131 critical value. = 1.80802; rejection of H ₀			

Note: Individual effects of particular countries were taken into consideration in the model but not calculated.

***means significance at 1%

Source: own calculations using GRETl

The next stage of the analysis involved calculating the TFP values (A_{it}) specific to individual countries and years. They were calculated according to the following formula:

$$A_{it} = TFP_{it} = \frac{(Y_{it}/L_{it})}{(K_{it}/L_{it})^a} \quad (18)$$

where a is the estimate of parameter α of model (17), amounting to 0.413661.

3. β - convergence process in the European Union in the period 2000- 2014

Studies on the β - convergence processes can be conducted using averaged data for the entire period or panel data. Taking into account the most traditional method based on averaged data, one should be aware that a limited number of observations influence the statistical credibility of the obtained results. However, from the economical point of view, the mentioned approach seems to be adequate, because it gives an opportunity to investigate the relation between initial conditions of economies and their long-run growth processes. On the other hand, due to taking into account a large

number of observations and various methods of estimation, it may be said that studies based on panel data are more solid. From the economic point of view, an analysis that uses that kind of data is distorted by the influence of business cycles and other irregular fluctuations of the economy. Besides, it is hard to expect that growth in GDP per capita (per worker) in time t is created by its level in time $t-1$. From the economic point of view, a good solution may be analysis based on data averaged for subperiods. In this case, the relation between the initial level of GDP and mid-term pace of economic growth can be investigated.

The survey on the convergence process between European Union countries in the period 2000-2014 is conducted with the use of the above mentioned methods. Furthermore, the analyses concern not only the entire group of 27 countries, but also the group of 15 “old” EU members and the group of 12 “new” member states.

In table 2 the estimation of structural parameters of equation (9) using averaged data for the period from 2000 to 2014 is included. White’s test for heteroscedasticity for growth regression models was conducted in order to confirm that OLS estimator is efficient and unbiased. The results of the conducted tests were satisfactory.

Table 2 Estimation results of the cross-sectional growth regression models describing absolute β - convergence among European Union Member States (EU-27, EU-15, EU-12) in the period 2000-2014; dependent variable: $\ln(Y_t/Y_0)$; OLS method of estimation

Variable / model diagnostics	EU-27	EU-12	EU-15
constant	4.90688	7.47519	0.0611445
stand. error	0.545091	0.858341	0.662507
Student’s t	9.002	8.709	0.09229
p value	2.56e-09	5.56e-06	0.9279
significance	***	***	
\ln GDP per worker in 2000 ($\ln Y_0$)	-0.412030	-0.667023	0.0298116
stand. error	0.0515015	0.0851528	0.0600736
Student’s t	-8.000	-7.833	0.4963
p value	2.35e-08	1.42e-05	0.6280
significance	***	***	
R^2	0.719119	0.859865	0.013045
Adjusted R^2	0.707883	0.845851	-0.062875
β convergence	yes	yes	no
β coefficient	0.01967	0.040729	-
Number of observations	27	12	15

Model diagnostics: White's test ¹	Test statistics = 9.022542 p value = 0.010984 critical value=9.21034 acceptance of H ₀	Test statistics = 0.19373 p value = 0.907679 critical value=9.21034 acceptance of H ₀	Test statistics = 0.199245 p value = 0.905179 critical value=9.21034 acceptance of H ₀
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¹Null hypothesis H₀: variance of error term is constant across observations (heteroscedasticity does not occur)

Source: own calculations using GRETL

The results indicate the presence of the β -convergence process in the EU-27 in the analysed period. The negative value of the statistically significant structural parameter β_1 of the equation (9) indicates a negative correlation between the initial level of income per worker (in 2000) and economic growth rate in the period of 2000-2014. The speed of convergence (β coefficient)⁵ amounts to 1.9%. The β_1 coefficient obtained for the UE-12 group is statistically significant and its negative sign stands for the existence of the convergence process between the “new” EU members. In the analysed period, the countries with lower GDP per worker approached the level of prosperity of richer ones at the relatively high rate of 4.07% per year. According to the results included in table 2, β_1 coefficient obtained for UE-15 is positive and statistically insignificant. It means that the divergence process between the “old” EU members exists.

The above statements are also confirmed by the results of the estimation of equation (9) with the use of panel data. Three periods, 2000-2004, 2005-2009 and 2010-2014 were taken into account. For each model the Breusch-Pagan test for the presence of individual effects was conducted. Additionally, for the first model (UE-27 group) the test for diversification of the constant in groups, confirming a viable use of the *within* estimator, was used.

Table 3 Estimation results of panel growth regression models describing absolute convergence β among European Union Member States (EU-27, EU-15, EU-12) in 2000-2014; dependent variable: $\ln(Y_t/Y_0)$

Variable / model diagnostics	EU-27	EU-12	EU-15
constant	3.03499	2.95965	0.574810
stand. error	0.385134	0.344423	0.328353
Student's t	7.880	8.593	1.751
p value	1.74e-010	4.87e-010	0.0872
significance	***	***	*
\ln GDP per capita in 2000 ($\ln Y_{0t}$)	-0.266316	-0.283873	-0.0416554
stand. error	0.0356326	0.0330808	0.0294957
	-7.474	-8.5812	-1.412

⁵ β coefficient is calculated using the following formula: $\beta = -\ln(1 + \beta_1) / T$, where T is the interval between the first and the last observation.

Student's t p value significance	7.79e-010 ***	2.71e-09 ***	0.1651
LSDV R ²	0.752043	-	-
Within R ²	0.513136	-	-
R ²	-	0.651734	0.044327
Adjusted R ²	-	0.641491	0.022102
β convergence	yes	yes	no
β coefficient	0.020645	0.02226	-
Number of observations	81	36	45
Estimator	within	OLS	OLS
Model diagnostics	Test for diversification of the constant in groups ¹ test stat.: F(26. 53) = 1.98 critical value= 1.705 rejection of Ho	Breusch-Pagan test ² : LM = 0.0625686 critical value= 6.6349 acceptance of Ho	Breusch-Pagan test ² : LM = 3.19675 critical value=6.6349 acceptance of Ho

¹Null hypothesis H₀: the groups have a common constant; rejection of H₀ means a viable use of the fixed effect model

² Null hypothesis H₀: Error variance in a unit = 0; rejection of H₀ means that the introduction of individual effects is desirable; no possibility of using the OLS

Source: own calculations using GRETL

According to the obtained results, the absolute convergence process existed in the entire group of 27 countries as well as in the group of the “new” and relatively less developed countries. In models constructed for the mentioned groups, the negative and statistically significant β_1 coefficients were obtained. The speed of the convergence process amounted to 2% and 2.2% respectively. In the light of the results included in table 3, the convergence process did not exist in the group of the most developed EU members (β_1 coefficient was positive and insignificant from the statistical point of view).

4. The tests for the existence of neoclassical and technological catching-up in European Union member states in the period 2000- 2014

The existence of capital deepening and technological catching-up mechanisms of convergence in the UE-27, UE-15 and UE-12 groups was verified, at first, through the estimation of equation (10), and then through the estimation of structural parameters of equation (12). The surveys were conducted with the use of cross-sectional as well as panel data analysis (a panel with five-year subperiods for

each country).⁶ The OLS estimator was employed to estimate the structural parameters of the cross-sectional regressions. In order to confirm that the OLS estimator was efficient and unbiased, model diagnostic procedures (White's test for heteroscedasticity and the Jarque Berra normality test) were conducted. The results of the mentioned tests were satisfactory (see table 4 and 6). The estimation technique of panel data regressions was employed after conducting the Breusch- Pagan test. The results suggested the absence of individual effects and the use of OLS estimator in all the analysed models (see table 5 and 7).

The coefficient estimates of the variables in model (10) with averaged data for the particular groups of countries are included in table 4. The negative and statistically significant β_2 coefficients (for the initial level of capital per worker) in models constructed for the UE-27 and UE-12 groups imply that the neoclassical catching-up process occurs. Furthermore, the positive and significant γ_2 coefficients (for the initial technological gap) stand for the presence of technological catching-up between the countries in the mentioned groups. Taking into account the values of the obtained coefficient estimates, one may conjecture that the technological channel of convergence in UE-27 and UE-12 is much more important.

Table 4 Neoclassical and technological catching-up in β -convergence cross-sectional regressions for UE-27, EU- 15 and EU-12 in the period 2000-2014 ;equation (10); OLS method of estimation

Group of countries	α_2	β_2	γ_2	R^2 Adj. R^2	Obs.	Model diagnostics	
						White's test ¹	JB normality test ²
UE-27	0.193124 (1.29176)	-0.199785 (0.0325246) ***	0.411038 (0.177071) **	0.795891 0.778142	27	test stat. = 3.69773 p value = 0.593702 crit. value=15.0863 acceptance of H_0	test stat. = 2.89081 p value = 0.23565 crit. value=9.21034 acceptance of H_0
UE-15	-1.34998 (1.25811)	0.0655704 (0.0748367)	0.168218 (0.134773)	0.154109 0.000311	15	test stat. = 13.5208 p value = 0.0189574 crit. value=15.0863 acceptance of H_0	test stat. = 2.79577 p value = 0.247119 crit. value=9.21034 acceptance of H_0

⁶ The sources of the data used in models are explained in section 2

UE-12	- 1.5706 4 (1.868 02)	-0.252496 (0.0532745) ***	0.781068 (0.262924) **	0.8474 65 0.8135 68	12	test stat. = 4.39821 p value = 0.493618 crit. value=15.0863 acceptance of H ₀	test stat. = 9.13273 p value = 0.056968 crit. value= 9.2103 acceptance of H ₀
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¹ Null hypothesis H₀: variance of error term is constant across observations (heteroscedasticity does not occur)

² Null hypothesis H₀: residuals are normally distributed

***/** means significance at 1%, 5%; the numbers in brackets denote the value of standard error

Source: own calculations using GRETL

According to the results shown in table 4, neither neoclassical nor technological mechanism works in the group of the “former 15”. β_2 and γ_2 coefficients in the model for the UE-15 group are statistically insignificant.

Table 5 summarises the parameter estimates of model (10) with the use of panel data. In the models made for UE-27 and UE-15, β_2 coefficients are negative and statistically significant. γ_2 parameters are also significant but positive. It means that both (neoclassical and technological) catching-up mechanisms have occurred between countries of the above groups.

Table 5 Neoclassical and technological catching-up in β -convergence panel regressions for UE-27, EU-15 and EU-12 in the period 2000-2014 ;equation (10);OLS method of estimation

Group of countries	α_2	β_2	γ_2	R ² Adj. R ²	Obs.	Model diagnostics
						Breusch-Pagan test ¹
UE-27	0.88612 (0.402714)**	-0.0931004 (0.0106412)***	0.0474433 (0.0334663)*	0.557998 0.546212	78	test stat. = 0.000974858 p value = 0.975092 crit. value= 6.6349 acceptance of H ₀
UE-15	1.27101 (0.4874910)**	-0.0724024 (0.0272692)**	-0.0551467 (0.0645733)	0.169383 0.126787	42	test stat. = 0.847411 p value = 0.357286 crit. value= 6.6349 acceptance of H ₀

UE-12	0.187024 (0.608849)	-0.12766 (0.0188096)***	0.217491 (0.0926134)**	0.620632 0.597640	36	test stat. = 0.00353216 p value = 0.952608 crit. value= 6.6349 acceptance of H ₀
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¹Null hypothesis H₀: Error variance in a unit = 0; rejection of H₀ means that the introduction of individual effects is desirable; no possibility of using the OLS

***/**/*means significance at 1%, 5%,10%; the numbers in brackets denote the value of standard error

Source: own calculations using GRETL

Contrary to the result obtained in the cross-sectional regressions, in the panel model built for UE-15, a weak but statistically significant negative correlation between the initial level of capital per worker and GDP per worker growth is found (β_2 parameter amounts to -0,072). However, the γ_2 coefficient estimated as negative and insignificant results in the absence of the technological mechanism of the convergence process.

The second test for validity of the two alternative channels of convergence in the EU is connected with the estimation of model (12), explained in section 1. Table 6 shows the estimation results of cross-sectional regressions. In models for UE-27 and UE-12, the positive value of β_3 parameters, confirms the presence of the catching-up process due to diminishing returns to capital. The positive and statistically significant γ_3 coefficients, amounting to respectively 0.46 and 0.54, indicate that technological catching-up due to technology flows is present.

Table 6 Neoclassical and technological catching-up in growth rate decomposition cross-sectional regressions for UE-27, EU-15 and EU-12 in the period 2000-2014; equation (12); OLS method of estimation

Group of countries	α_3	β_3	γ_3	R ² /Adj. R ²	Obs.	Model diagnostics	
						White's test ¹	JB normality test ²
UE-27	-2.58442 (0.719614)** *	0.396352 (0.0421114)* **	0.46539 (0.122809)** *	0.88891 0.87925	27	test stat. = 6.7114 p value = 0.2430 crit. value= 15.086 acceptance of H ₀	test stat. = 0.6494 p value =0.7227 crit. value=9.210 acceptance of H ₀
UE-15	-1.22873 (0.876739)	0.192976 (0.12443)	0.254436 (0.142151)	0.25744 0.12243	15	test stat. = 3.1786 p value = 0.6725 crit. value=15.086 acceptance of H ₀	test stat. =0.9732 p value = 0.6147 crit. value=9.210

							acceptance of H_0
UE-12	-3.05834 (1.66179)*	0.381943 (0.0786358)* **	0.547068 (0.280364)*	0.85275 0.82002	12	test stat. = 8.6101 p value = 0.1257 crit. value=15.086 acceptance of H_0	test stat. = 1.3114 p value = 0.5191 crit. value= 9.210 acceptance of H_0

¹ Null hypothesis H_0 : variance of error term is constant across observations (heteroscedasticity does not occur)

² Null hypothesis H_0 : residuals are normally distributed

***/*means significance at 1%,10%; the numbers in brackets denote the value of standard error

Source: own calculations using GRETL

The coefficient estimates obtained in the model for UE-15 have positive signs, but they are insignificant from the statistical point of view. Thus, one can conjecture that none of the analysed convergence mechanisms works between the most developed EU members. In turn, the results obtained in the panel data version of model (12) reject the hypothesis of technological catching-up as a determinant of the convergence process, while they confirm the positive and statistically significant influence of capital deepening on the convergence process between them (see table 7).

Table 7 Neoclassical and technological catching-up in growth rate decomposition panel regressions for UE-27, EU-15 and EU-12 in the period 2000-2014; equation (12); OLS method of estimation

Group of countries	α_3	β_3	γ_3	R^2 Adj. R^2	Obs.	Model diagnostics
						Breusch-Pagan test ¹
UE-27	-0.98956 (0.329007)***	0.354627 (0.0417605)***	0.175978 (0.0547678)***	0.544679 0.532537	78	test stat. = 5.12383 p value = 0.0235995 crit. value= 6.6349 acceptance of H_0
UE-15	-0.249749 (0.387766)	0.299799 (0.0715399)***	0.0524655 (0.064248)	0.323755 0.289075	42	test stat. = 4.98723 p value = 0.0255351 crit. value= 6.6349 acceptance of H_0
UE-12	-1.36871 (0.668156)**	0.333278 (0.0690438)***	0.240265 (0.109574)**	0.467254 0.434966	36	test stat. = 1.53419

						p value = 0.215484 crit. value= 6.6349 acceptance of H ₀
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¹Null hypothesis H₀: Error variance in a unit = 0; rejection of H₀ means that the introduction of individual effects is desirable; no possibility of using the OLS

***/** means significance at 1%, 5%; the numbers in brackets denote the value of standard error

Source: own calculations using GRET

The growth rate decomposition panel regressions for the group of 27 and the “new” 12 countries are also built. The estimates support the previous statements that convergence process in the above groups of countries depends on capital accumulation, as well as on technological catching-up. Looking at the values of the parameter estimates, one can assume that technology transfers and technological gap as determinants of convergence are relatively more important in the UE-12 group.

The results of the above tests, regardless of the econometric specification and the type of data used in surveys, show that the technological channel is found as an important determinant of the convergence process in the entire group of analysed countries and between the “new” EU members, and it is totally insignificant in the UE-15 group. It leads to the conjecture that in the case of the UE-27 and UE-12 groups, technological progress is faster in economies with a relatively lower initial level of technology. In turn, technologically well-developed countries experience higher pace of technology growth than less developed countries of the UE-15 group. To prove it, an additional simple survey on the existence of productivity convergence is conducted. It consists in the examination of the relation between the initial technology level and technological progress in the analysed groups of countries. Table 8 includes the estimation results of models⁷ with averaged and panel data.

Regardless of the type of data taken into account, the obtained estimation results confirm that there is a statistically significant and negative correlation between the initial level of technology and technological progress in UE-27 group (θ coefficient amounts to about -0.34 and -0.19 respectively). Additionally, one can remark that the mentioned negative relation is even stronger between the “new” member states (θ coefficient amounts to about -0.56 and -0.38 respectively). In other words, the pace of productivity convergence between them is much higher than in the overall group of the analysed countries.

⁷The following regression is estimated $\ln\left(\frac{A_{it}}{A_{io}}\right) = \vartheta + \theta \ln(A_{io}) + \mu_{it}$. The negative and statistically significant ϑ coefficient indicates the presence of productivity convergence.

Table 8 Initial TFP level and TFP growth in 2000-2014 for UE-27, EU-15 and EU-12; cross-sectional and panel data regressions; OLS method of estimation

Group of countries	const.	θ	R ² Adj. R ²	Obs.	Model diagnostics
cross-sectional regression					
UE-27	2.29993 (0.643937) ***	-0.340309 (0.103980)** *	0.2999 43 0.2719 41	27	White's test ¹ : test stat. =8.06302; p value =0.0177475; crit. value= 9.21034; acceptance of H ₀ JB normality test ² : test stat. = 0.476526; p value = 0.787995; crit. value=9.21034; acceptance of H ₀
UE-15	1.0876 (0.86672)	-0.148432 (0.137917)	0.0818 11 0.0111 81	15	White's test: test stat. =2.55279; p value= 0.279041; crit. value= 9.21034; acceptance of H ₀ JB normality test: test stat.= 1.74095; p value= 0.418753; crit. value= 9.21034; acceptance of H ₀
UE-12	3.64275 (1.3268)**	-0.559931 (0.218346)* *	0.3967 28 0.3364 00	12	White's test: test stat.= 0.927622; p value= 0.628882; crit. value= 9.21034; acceptance of H ₀ JB normality test: test stat.= 1.20993; p value =0.546093; crit. value= 9.21034; acceptance of H ₀
panel data regression					
UE-27	1.25673 (0.284642) ***	-0.1912 (0.04529990) ***	0.1840 10 0.1736 81	81	Breusch-Pagan test ³ : test stat.=1.47735; p value= 0.224189; crit. value=6.6349; acceptance of H ₀
UE-15	0.549331 (0.29019)*	-0.0793251 (0.0456761) *	0.0655 44 0.0438 12	45	Breusch-Pagan test: test stat.=1.70594; p value = 0.191513; crit. value= 6.6349; acceptance of H ₀
UE-12	2.43497 (0.590832) ***	-0.382072 (0.0953684) ***	0.3206 83 0.3007 03	36	Breusch-Pagan test: test stat.= 0.038149; p value =0.845144; crit. value= 6.6349; acceptance of H ₀

¹Null hypothesis H₀: variance of error term is constant across observations (heteroscedasticity does not occur)

² Null hypothesis H₀: residuals are normally distributed

³Null hypothesis H₀: Error variance in a unit = 0; rejection of H₀ means that the introduction of individual effects is desirable; no possibility of using the OLS

***/**means significance at 1%, 5%; the numbers in brackets denote the value of standard error

Source: own calculations using GRETL

In turn, the estimates of the models built for the UE-15 group indicate either the absence of productivity convergence (θ coefficient is negative but statistically insignificant in the model based on averaged data) or the presence of a very weak negative relationship between the initial level of technology and the pace of technological progress (θ coefficient is estimated to be only -0.08 in the model based on panel data).

5. Conclusions

The paper provides evidence for the presence of the β -convergence process between European Union countries in the period 2000-2014. The conducted analysis clearly indicates that the catching-up process existed in the analysed group of 27 member states. Moreover, the speed of convergence was much stronger between 12 “new” members than in the entire group. However, a surprising aspect of it is that in the analysed period, the convergence between the most developed “old” EU countries did not exist. In other words, in the UE-15 group the relatively poorer countries did not catch-up with the richer ones.

The paper was aimed mainly at identifying the possible mechanisms responsible for generating the obtained convergence results. The conducted empirical surveys were focused on the neoclassical and technological catching-up mechanisms, proposed by the economic theory. The validity of the two alternative convergence driving forces was tested with the use of two different econometric specifications and two different types of data.

The obtained results confirmed that both channels of convergence: neoclassical and technological occurred in the group of 27 EU members. Moreover, the technological mechanism seemed to be more important than the neoclassical one. The mentioned phenomenon was particularly visible between the “new” EU countries. Regardless of the econometric specification and the type of data used in surveys, the obtained results indicated that the β -convergence process between them was the result of differences in technology levels and technology transfer rather than capital accumulation.

The results obtained for the group of “old” UE members were ambiguous. No evidence for the existence of technological channel of convergence process in that group of countries was found. The estimation results of models based on averaged data denoted also the lack of the neoclassical mechanism, while estimations of panel models signalled the importance of capital deepening. Even though the last mechanism was found, it turned out not to be sufficient to influence the β -convergence process in the group of the most developed EU countries.

In general, one may conclude that the technological channel, not capital accumulation, is the driving force of the converge process in the European Union. The more intensive technological

catching-up process, the higher the speed of β - convergence. The above statement was also confirmed by the survey on the existence of productivity convergence between the analysed countries.

In the UE-27 and UE-12 groups, where productivity convergence appeared (technological progress was faster in the countries with relatively lower initial TFP level), the β -convergence process was found. It is worth adding that productivity convergence in the mentioned groups was a result of high diversity of technology levels and intensive technology transfer between countries. Moreover, medium-high technologies that are relatively easy to implement were mostly transferred.

In contrast, in the UE-15 group, where countries with higher productivity level experienced the highest technology progress, technological catching-up did not occur, and nor did the β -convergence process. One can suppose, that between the most developed EU countries having similar technology levels and small technological gaps, technology transfer was much less intense (the implementation of high technologies requires specific absorptive capabilities, the most groundbreaking technologies are particularly protected etc.).

The obtained results and insights about the sources of the convergence process in the European Union might be an important signal for the convergence policy pursued at the national and European level. The policy concentrated on the dynamics of capital seems to be not effective enough to increase the speed of the convergence process. Bearing in mind the key role of productivity convergence, the policy should move forward in the direction of deepening countries' absorptive and imitation capabilities, as well as supporting technology transfer.

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Personal Income Tax Progressivity and Output Volatility in Poland

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Financial Crisis has revived discussion about the role of state in smoothing business cycle fluctuations and passive fiscal policy instruments effectiveness. The role of automatic stabilisers, and their advantages in terms of being timely, targeted, and temporary, has been widely discussed on this occasion. On the one side of this discussion there is a view that using discretionary fiscal policy may lead to booster fluctuations of general demand because of long and unpredictable delay between the start of recession and results of changes in fiscal policy Hemming et al. (2002), Taylor (2009) and Cogan et al. (2010). On the other side of the discussion there is a view that severity and range of crisis made that using automatic stabilizers should be strengthened by discretionary fiscal policy. It is stressed that accommodative monetary policy and low interest rates have positive impact on discretionary fiscal policy and the level of fiscal multiplier (Christiano et al., (2011), Davig i Leeper (2011) oraz Coenen et al., (2012)). Both sides of these discussion indicate on the advantage of passive fiscal policy which comes from predictability and swift action.

According to Auerbach i Feenberg automatic stabilizers are defined as those elements of fiscal policy which influence the changes in GDP without the government decisions (Auerbach, Feenberg, 2000, p.1). Automatic Stabilizers include social spending and progressive taxation.

Progressive taxation is defined as larger reduce of tax liabilities than income reduction. Progressive taxation acts countercyclical by releasing resources during downturn and shifting these resources towards households suffering from liquidity shortages (Attinasi, et al., 2011, p. 6).

The goal of this paper is to examine the impact of personal income tax and social security contributions in stabilizing the economy in Poland in 2000-2008 and 2009-15 and also to investigate empirically the effect of personal income tax progressivity on output volatility. The methodology to asses stabilizing function of personal income tax and social security contributions was based on short term output elasticities of these budget categories estimates. Although generally weak stabilizing effectiveness of personal income tax and social security contributions, the paper finds empirical evidence for the hypothesis that higher personal income tax progressivity leads to reduced output volatility.

1. Literature Review

Automatic stabilizers are traditionally associated with the Keynesian model of business cycles, and are seen as important and effective for smoothing business cycle fluctuations.

Progressive taxation makes disposable income less volatile than income and reduces fluctuations in GDP. In this framework taxes are always output stabilizing and the higher and the more progressive are the taxes the larger will be the smoothness of output.

In the seminal paper Gali shows that increasing the size of government reduces the volatility of gross income as well as disposable income. Gali estimated stabilizing effectiveness of personal taxes and government spending in 22 OECD countries during 1960-1990. He provides the evidence of negative relationship between the output volatility and government size. Countries with the high share of government in GDP (such as: Netherlands, Norway, Sweden) have smoother amplitude of cyclical GDP fluctuations than countries with limited governments (such as: Japan, Spain, Portugal) (Gali, 1994, p. 125-130).

A few years later, Fatás and Mihov in a influential study addressed this point. For the sample of 20 OECD countries, the government size they estimated as the average rate of the share of public spending in GDP during 1960-1997 and the product fluctuations they estimated as standard deviation of real GDP. The authors attribute the negative relationship between government size and the automatic stabilizers effectiveness (Fatas, Mihov, (2001), p. 17-19).

Kim and Lee, using Keynesian model of business cycle, estimated the relation between the government size (measured as the share of total government spending in GDP) and economic instability (measured as intersectoral income fluctuations). Key empirical finding of the paper includes that a larger government reduces economic uncertainty and enhances the instruments of passive fiscal policy effectiveness (Kim, Lee (2007), p. 30).

Nevertheless there are quite number of studies which indicate that progressive taxation and high taxes have negative effect on smoothing income fluctuations and effectiveness of economic activity.

The existence of the tradeoff between the government size and automatic stabilizers effectiveness has been questioned by Buti et al. (2003). The authors consider using passive fiscal policy instruments on the demand side (through the positive impact on disposable income) and on the supply side (through the negative impact of taxes on the production process). The employers' reaction on the rise of inflation is increasing demand on the workforce to enlarge the level of production. Assuming the personal income tax progressivity, the employer will be forced to increase the salary not only because of inflation but also because the it boosts **workers'** pay up to the **higher** income **threshold**. The authors argued that there is a critical level of taxes beyond which a reduction in taxation may not only improve efficiency, but also make fiscal automatic stabilizers

more effective. Specifically, the conventional view is challenged if the distorting effects of taxes are explicitly specified in the model, in particular if they are meant to affect the elasticity of the supply function. In this case, financing government spending through distorting taxation might destabilize output in the case of supply shocks. Moreover, fiscal policy would be price destabilizing not only in the event of a supply shock, but also after a demand shock (Buti et al., 2003, p. 8-9).

Martinez-Mongay's and Sekkat's analysis provide evidence that relationship between public sector size and macroeconomic stability is not linear. The composition of public finances, in particular the tax mix, matters for output and price volatility. The authors, just as Buti et al. point that distorting taxes, namely taxes on labor, might have negative effects on macroeconomic stability. The analysis implies that a reduction in the tax burden might carry a "double dividend" of efficiency gains and better fiscal stabilization properties. It means that lower taxes encourage trade off inflation and unemployment in the short time through reducing the difference between marginal labor cost and marginal net salary (Martinez-Mongay, Sekkat, (2005), p. 6- 26).

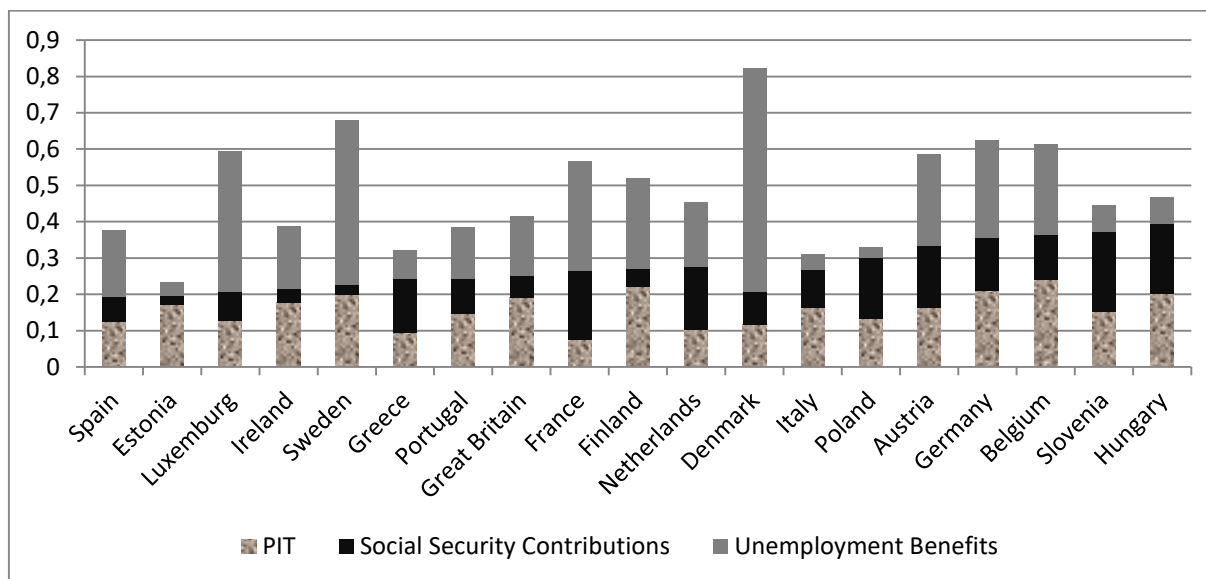
Using the revenue elasticities approach, Baunsgaard and Symansky find that increasing the elasticity of PIT revenues leads only to modest increases in automatic stabilisers. They point that increasing PIT elasticity enhances its stabilization function in reducing output fluctuations only by 0,01% GDP (Baunsgaard, Symansky, 2009, p.9-10).

Over the last three decades, total tax burdens (total tax revenues in terms of GDP) in the EU⁸ have increased markedly to stand at a significantly higher level than in the USA. The EU total tax burden was more than 10 percentage points higher than in the US but PIT revenues in EU are 3% of GDP lower than in the USA.

Dolls, Fuest and Peichl investigated the extent to which automatic stabilizers cushion household disposable income and household demand in the event of macroeconomic shocks.

Figure 1. Decomposition output stabilization coefficient in EU countries in 2009.

⁸ Data relates to UE countries which are also OECD members.



Źródło: Dolls, et al., (2010), p. 32.

The results of Dolls, et al. empirical research show hypothetical working of automatic stabilizers in different countries if crisis would hit them symmetrically and temporarily. The results for the stabilization coefficient vary considerably across countries, as can be seen from Figure 1. The highest stabilization coefficient would have Nordic countries with extended social welfare system. Fluctuations of aggregated demand would be cushioned in this case by more than 70%. On the opposite side there are countries with liberal economic model: Estonia, Poland and PIGS countries. It is worth underlying that Poland has no generous protection system and in the same time relatively low value of stabilization from unemployment benefits (about 3%). Interestingly, relatively high values for automatic stabilization effects of the tax and social security contributions which absorb around 30% of the shock in Poland.

2. Stabilizing effects of PIT and Social Security Contributions in Poland in 2000-2008 and 2008-1015 – results of empirical research

The aim of the research was to investigate the efficiency of PIT as automatic stabilizer in Poland in 2000-2008 when there were three tax rate bands and in 2008-2014 when two personal income tax rate bands were introduced.

2.1. Statistical data and model

To measure the PIT effectiveness in smoothing consumption fluctuations the methodology based on estimation of short term elasticities of PIT and social security contributions with respect to GDP was used (Mackiewicz, Krajewski, (2008), p. 18-23).

To investigate the PIT and social security contributions effectiveness in smoothing consumption (and output) fluctuations the following formula was used:

$$\frac{\Delta C}{\Delta Y} = -cp \left(\varepsilon_{PIT,Y} \cdot \frac{PIT}{Y} + \varepsilon_{SUS,Y} \cdot \frac{SUS}{Y} \right) \quad (1)$$

where:

cp – marginal propensity to consume resulting from temporary changes of income,

$\varepsilon_{SUS,Y}$ - short term elasticity of social security contributions with respect to GDP,

$\frac{SUS}{Y}$ - share of social security contributions revenues in GDP,

$\varepsilon_{PIT,Y}$ - short term elasticity of PIT revenues with respect to GDP,

$\frac{PIT}{Y}$ - share of PIT revenues in GDP.

$$\varepsilon_{PIT,Y} = \varepsilon_{E,Y} \cdot \varepsilon_{W,E} \cdot \varepsilon_{PIT,W} + \varepsilon_{E,Y} \quad (2)$$

where:

$\varepsilon_{E,Y}$ - short term elasticity of employment with respect to GDP measured as the impact of cyclical changes in employment on tax revenues (Van den Noord, (2000), p. 22),

$\varepsilon_{W,E}$ - short term elasticity of the average salary with respect to employment,

$\varepsilon_{PIT,W}$ - elasticity of PIT revenues per one worker with respect to the average salary.

Coefficient $\varepsilon_{PIT,W}$ was estimated by calculating for each threshold the ratio of marginal tax rate to average tax rate, and then calculating weighted average, where the weights are the level of tax revenues gained from respective thresholds:

$$\varepsilon_{PIT,W} = \sum_{j=1}^n w_j \frac{MTR_j}{ATR_j} \quad (3)$$

where:

w_j – share of tax revenues from tax payers belonging to j threshold in total PIT revenues,

MTR_j – marginal tax rate for j threshold,

ATR_j – effective (average) tax rate for j threshold..

Analysis concerning effects of output changes on employment changes were based on Okun`s Law.

The following dynamic version of equation was used (Crivelli, et al., 2010, p. 5):

$$\ln(Z_{t,i}) = \alpha_0 + \beta_s \ln(Z_{t,i-s}) + \gamma_p \ln(PKB_{t,i-p}) + \varepsilon_{t,i} \quad (4)$$

where:

Z – rate of employment growth;

PKB – rate of GDP growth;

t – year number;

i – quarter number;

α_0 - constant,

β_1 - coefficient measuring elasticity of employment with respect to GDP,

ε - residual.

s - lag of dependent variable, $s=1,\dots,4$

p - lag of independent variable, $p=1,\dots,4$

γ_p - short term elasticities of unemployment rate changes with respect to output changes.

Lags in equation (4) are included because employers need time to adjust changes in employment in response to output changes. It makes that short time employment-output elasticities may be different from long term ones.

Estimating the impact of employment changes on average real earnings was based on Phillips Curve. The concept behind the Phillips Curve states the employment growth has predictable effect on real earnings growth. In the short time the level of real earnings depends on the level of employment and productivity. To estimate short term elasticity of earnings with respect to employment in 2000-2008 and 2009-2014 the following equation was used:

$$\ln(w_{t,i}) = \alpha_0 + \beta_1 \ln(Z_{t,i}) + \beta_2 \ln(Y / Z_{t,i}) + \varepsilon_{t,i} \quad (5)$$

where:

w - level of real earnings,

Z - level of employment,

t - year number;

i - quarter number;

Y / Z - productivity,

β_1 - coefficient describing elasticity of real earnings with respect to real employment growth,

β_2 - coefficient describing elasticity of real earnings with respect to real productivity.

To estimate the the impact force of PIT revenues on cyclical fluctuations smoothing, the level of marginal propensity to consume out of temporary income should be calculated (cp). To calculate cp coefficient, Friedman's consumption function was estimated:

$$\ln(C_t) = \alpha_0 + \beta_1 \ln(YP_t) + \varepsilon_t \quad (6)$$

$$YP_t = \frac{Y_{t-1} + Y_{t-2}}{2}$$

where:

C_t = individual consumption (in mln Polish zloty),

Y_t = disposable income calculated as GDP minus income taxes (in mln Polish zloty).

Coefficient β_1 reflects marginal propensity to consume out of permanent income changes. As mentioned above, to analyze the passive fiscal policy effectiveness, marginal propensity to consume out of temporary income (reflecting output fluctuations during business cycle) should be taken into account. The coefficient cp can be estimated using the following formula:

$$cp = \left(\frac{\Delta W}{\Delta D} \cdot \frac{D}{W} \right) \cdot \frac{W}{D} \quad (7)$$

where: $\left(\frac{\Delta W}{\Delta D} \cdot \frac{D}{W} \right)$ - elasticity of consumption with respect to disposable income, estimated as coefficient β_1 in equation 6.

Provided that employment growth leads to social security contribution proportional growth and new employed workers have the same income distribution as until now employed, elasticity of average social security contribution with respect to average pay rate equals 1. Then, the short term elasticity of social security contributions with respect to GDP formula is as following (Giono, et al. (1995), p. 48):

$$\varepsilon_{SUS,Y} = \varepsilon_{E,Y} (1 + \varepsilon_{W,E}) = \varepsilon_{E,Y} + \varepsilon_{E,Y} \cdot \varepsilon_{W,E} \quad (8)$$

Data used in the paper are taken from Central Statistical Office (CSO) database: *Quarterly Macroeconomic Indicators* and Ministry of Finance annual data concerning marginal and average tax rates.

To estimate marginal propensity to consume CSO data concerning individual consumption and disposable income in 2000-2008 and 2009-2014 were used.

To estimate the model the ordinary least square regression (OLS) was used. Each equation was estimated separately for the period 2000-2008 and 2009-2014.

2.2. Estimation results

Generally, it is accepted that elasticity of income taxes with respect to GDP in the long term is constant (provided lack of changes in tax law). Nevertheless, because of cyclical fluctuations elasticity indicators may change during the cycle. Empirical studies typically find personal income tax progressive which means that PIT revenues elasticity rate with respect to GDP is over 1 (Girouard, Andre, 2005, p. 16). Thus tax revenues elasticity rates with respect to GDP in the short time are higher than in the long time of period.

In 2010 in Poland two personal income tax rates were in force: 18% and 32%. The bigger spread between marginal and effective tax rate (including deduction of personal allowance or other tax reliefs), the bigger payed tax elasticity with respect to earnings changes.

Table 1. Marginal and effective PIT rates in 2010.

Marginal PIT rate	Effective PIT rate	Relation of marginal to effective PIT rate	Share of total PIT revenues
18%	14,07%	1,28	77,32
32%	22,03%	1,45	22,68

Source: Calculations based on Ministry of Finance database: *Informacja dotycząca rozliczenia podatku dochodowego od osób fizycznych za 2010 rok*, p. 11.

On the basis of equation (3) and table 1, short term elasticity of PIT revenues falls to every taxpayer with respect to average income ($\varepsilon_{PIT,W}$) was amounted to 1,32 (average earnings growth by 1 PLN implied PIT revenues growth by 1,32 PLN).

In 2006 when progressive system with three nominal personal income tax rates was in force short term elasticity of PIT revenues falls to every taxpayer with respect to average income was amounted to 1,36 (Mackiewicz, Krajewski, (2008), p. 22).

Estimation results for equation 4 for the period 2000-2008 confirm statistically significant relationship between the output and employment. GDP growth by 1% implied employment growth by 0,15%. Unit root test (table 2a) was performed to confirm time series cointegration.

Table 2. Equation 4: OLS, using observations 2000:4-2008:4 (N = 33), dependent variable: l_Z .

	coefficient	std. error	t-ratio	p-value	
const	0,168412	1,21650	0,1384	0,8909	
l_Y	0,156194	0,0415920	3,755	0,0008	***
l_Z_1	-0,411411	0,157512	-2,612	0,0143	**
l_Z_2	0,677404	0,0935595	7,240	7,00e-08	***
l_Z_3	0,511913	0,151392	3,381	0,0021	***

Mean dependent var	9,502258	S.D. dependent var	0,071466
Sum squared resid	0,040128	S.E. of regression	0,037857
R-squared	0,754469	Adjusted R-squared	0,719393
F(2, 4)	21,50963	P-value(F)	3,35e-08
Log-likelihood	63,92598	Akaike criterion	-117,8520
Schwarz criterion	-110,3694	Hannan-Quinn	-115,3343
rho	0,042394	Durbin-Watson	0,528289

LM test for autocorrelation up to order 4

Null hypothesis: no autocorrelation

Test statistic: LMF = 0,55443

with p-value $P(F(4,24) > 0,55443) = 0,697725$

Null hypothesis is accepted.
White's test for heteroskedasticity
Null hypothesis: heteroskedasticity not present
Test statistic: LM = 27,5638
with p-value $P(\text{Chi-kwadrat}(14) > 27,5638) = 0,0162474$
Null hypothesis is accepted.
Test for normality of residual
Null hypothesis: error is normally distributed
Test statistic: Chi-square(2) = 4,6717
with p-value = 0,0967285
Null hypothesis is accepted.

*** Variable significant at significance level of 1%, ** Variable significant at significance level of 5%.

Source: Calculations performed using GRET.

Table 2a. Equation 4: Augmented Dickey-Fuller test for u_{hat} including two of (1-L) u_{hat} , sample size 33.

Unit-root null hypothesis: $a = 1$
model: $(1-L)y = b_0 + b_1*t + (a-1)*y(-1) + \dots + e$
1st-order autocorrelation coeff. for e: 0,455
estimated value of $(a - 1)$: -2,63287
test statistic: $\tau_{ct}(2) = -7,94788$
asymptotic p-value $p = 1,8e-017$
critical value for the Dickey-Fuller test = -3,50 at the significance level of 5%
Unit root does not exist. There is evidence for a cointegrating relationship.

Source: Calculations performed using GRET.

Table 3 provides evidence that variable Y_1 was significant determinant of employment in 2009-20015. Coefficient of short term employment elasticity of GDP stood at 0,05 during 1Q.2009-IVQ.2015 (it means that 1% GDP growth implied employment growth by 0,05%). The value of estimated short term employment elasticity of GDP is low, which suggests that reaction of employment to output changes was very weak. According to empirical studies, in Poland value of employment elasticity of GDP coefficient is lower during the following economic downturns (Ossowski, 2010, p. 49). It seems that nowadays to increase job creation lower growth of GDP is needed. There are some possible reasons of that: labor productivity changes, lower intensity of changes in the sectorial structure and economic policy and different character of macroeconomic shocks (Bartosik, 2013, p. 21). Unit root test (table 3a) was performed to confirm time series cointegration.

Table 3. Equation 4: OLS, using observations 2009:3-2016:1 (N = 27), dependent variable: l_Z .

	coefficient	std. error	t-ratio	p-value	
const	2,06727	0,597685	3,459	0,0021	***
l_Y_1	0,0526198	0,0113712	4,627	0,0001	***
l_Z_1	1,29883	0,172597	7,525	1,21e-07	***
l_Z_2	-0,602244	0,199672	-3,016	0,0062	***

Mean dependent var	9,047712	S.D. dependent var	0,016528
Sum squared resid	0,000298	S.E. of regression	0,003602
R-squared	0,957988	Adjusted R-squared	0,952508
F(2, 20)	174,8219	P-value(F)	5,71e-16
Log-likelihood	115,7631	Akaike criterion	-223,5262
Schwarz criterion	-218,3428	Hannan-Quinn	-221,9849
rho	-0,087155	Durbin-Watson	-0,935922

LM test for autocorrelation up to order 4

Null hypothesis: no autocorrelation

Test statistic: LMF = 0,374906

with p-value $P(F(4,19) > 0,374906) = 0,823631$

Null hypothesis is accepted.

White's test for heteroskedasticity

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 6,91819

with p-value $P(\text{Chi-kwadrat}(9) > 6,91819) = 0,645636$

Null hypothesis is accepted.

Test for normality of residual

Null hypothesis: error is normally distributed

Test statistic: Chi-square(2) = 5,82137

with p-value = 0,0544384

Null hypothesis is accepted.

*** Variable significant at significance level of 1%, ** Variable significant at significance level of 5%.

Source: Calculations performed using GRETL.

Table 3a. Equation 4: Augmented Dickey-Fuller test for uhat including two of (1-L) uhat, sample size 29.

Unit-root null hypothesis: a = 1	
model: $(1-L)y = b_0 + b_1 \cdot t + (a-1) \cdot y(-1) + \dots + e$	
1st-order autocorrelation coeff. for e: 0,358	
estimated value of $(a - 1)$: -2,63287	
test statistic: $\tau_{ct}(2) = -4,99883$	
asymptotic p-value $p = 0,0008475$	
critical value for the Dickey-Fuller test = -3,50 at the significance level of 5%	
Unit root does not exist. There is evidence for a cointegrating relationship.	

Source: Calculations performed using GRETl.

Estimation results for equation 5 for the period 2000-2008 confirmed autocorrelation existence. As a result, relationship between the real earnings, employment and labor productivity should be estimated by the following equation:

$$\ln(w_{t,i}) = \alpha_0 + \beta_1 \ln(Z_{t,i}) + \beta_2 \ln(Y / Z_{t,i}) + \delta_{t,i} \quad (6)$$

where:

$$\delta_{t,i} = \rho \cdot \delta_{t-1,i} + \eta_{t,i}, \text{ for } i=1$$

Table 4. Equation 5: Cochrane-Orcutt estimation, using observations 2000:2-2008:4 (N = 35), dependent variable: \ln_w_realne .

	coefficient	std. error	t-ratio	p-value	
const	0,158176	0,833080	0,1899	0,8506	
\ln_Z	0,585704	0,0832532	7,035	5,63e-08	***
\ln_Y_Z	0,708933	0,0286620	24,73	1,99e-022	***

Mean dependent var	7,758731	S.D. dependent var	0,135729
Sum squared resid	0,048175	S.E. of regression	0,038800
R-squared	0,923605	Adjusted R-squared	0,918831
F(2, 32)	318,4936	P-value(F)	7,51e-22
rho	0,044557	Durbin-Watson	1,883410

ARCH test max lag 4	
Null hypothesis: heteroskedasticity not present	
Test statistic: LM = 9,21152	
with p-value $P(\text{Chi-kwadrat}(4) > 9,21152) = 0,0560246$	
Null hypothesis is accepted.	

Test for normality of residual

Null hypothesis: error is normally distributed

Test statistic: Chi-square(2) = 1,60642

with p-value = 0,447889

Null hypothesis is accepted.

*** Variable significant at significance level of 1%, ** Variable significant at significance level of 5%.

Source: Calculations performed using GRETL.

Table 4a. Equation 5: Augmented Dickey-Fuller test for uhat including two of (1-L) uhat, sample size 36.

Unit-root null hypothesis: $\alpha = 1$
model: $(1-L)y = b_0 + b_1*t + (\alpha-1)*y(-1) + \dots + e$
1st-order autocorrelation coeff. for e: -0,012
estimated value of $(\alpha - 1)$: -0,76476
test statistic: $\tau_{ct}(2) = -4,58492$
asymptotic p-value $p = 0,04002$
critical value for the Dickey-Fuller test = -3,50 at the significance level of 5%
Unit root does not exist. There is evidence for a cointegrating relationship.

Source: Calculations performed using GRETL.

The estimation of equation (5) provides statistically significant relationship between the level of real earnings, employment and labor productivity in 2000-2008. 1% employment growth implied real earnings growth by 0,58%. Unit root test (tab 4a) was performed to confirm time series cointegration.

Table 5. Equation 6: OLS, using observations 2009:1-2014:4 (N = 24), dependent variable: $l_wrealne$.

	coefficient	std. error	t-ratio	p-value	
const	-18,4673	5,34344	-3,456	0,0024	***
l_Y_Z	0,353061	0,0891681	3,959	0,0007	***
l_Z	2,79526	0,615300	4,543	0,0002	***

Mean dependent var	8,154087	S.D. dependent var	0,076202
Sum squared resid	0,022018	S.E. of regression	0,032380
R-squared	0,835142	Adjusted R-squared	0,819442
F(2, 20)	53,19136	P-value(F)	6,02e-09
Log-likelihood	49,87308	Akaike criterion	-93,74616
Schwarz criterion	-90,21200	Hannan-Quinn	-92,80854
rho	0,218960	Durbin-Watson	1,527678

<p align="center">LM test for autocorrelation up to order 4</p> <p>Null hypothesis: no autocorrelation</p> <p>Test statistic: LMF = 4,48047</p> <p>with p-value $p = P(F(4,17) > 4,48047) = 0,0117986$</p> <p>Null hypothesis is accepted.</p>
<p align="center">White's test for heteroskedasticity</p> <p>Null hypothesis: heteroskedasticity not present</p> <p>Test statistic: LM = 3,62637</p> <p>with p-value $p = P(\text{Chi-kwadrat}(5) > 3,62637) = 0,604358$</p> <p>Null hypothesis is accepted.</p>
<p align="center">Test for normality of residual</p> <p>Null hypothesis: error is normally distributed</p> <p>Test statistic: Chi-square(2) = 1,40924</p> <p>with p-value = 0,494296</p> <p>Null hypothesis is accepted.</p>

*** Variable significant at significance level of 1%, ** Variable significant at significance level of 5%.

Source: Calculations performed using GRETl.

Table 5a. Equation 5: Augmented Dickey-Fuller test for \hat{u}_{it} including two of $(1-L)$ \hat{u}_{it} , sample size 28.

<p align="center">Unit-root null hypothesis: $\alpha = 1$</p> <p>model: $(1-L)y = b_0 + b_1 \cdot t + (\alpha - 1) \cdot y(-1) + \dots + e$</p>
<p>1st-order autocorrelation coeff. for e: 0,495</p> <p>estimated value of $(\alpha - 1)$: -3,29567</p>
<p>test statistic: $\tau_{ct}(2) = -9,25797$</p> <p>asymptotic p-value $p = 0,2255$</p> <p>critical value for the Dickey-Fuller test = -3,50 at the significance level of 5%</p>
<p>Unit root does not exist. There is evidence for a cointegrating relationship.</p>

Source: Calculations performed using GRETl.

The estimation of equation (5) provides statistically significant relationship between the level of real earnings, employment and labor productivity in 2009-2015. From 1.Q.2009 till IV.Q. 2015 employment growth affected changes earnings growth more than labor productivity growth. According to estimation result, in the short time changes of real earnings were stronger than changes in employment. In the analyzed time period average annual real earnings growth was almost twice as high as employment growth⁹. Unit root test (tab 5a) was performed to confirm time series cointegration.

⁹ From I.Q.2008 to IV.Q.2013 quarterly growth of real earnings stood at 1,7% and quarterly growth of employment stood at 0,9% (source: Central Statistical Office database).

Basing on the equation (2) and calculation presented above, short term elasticity of PIT revenues with respect to GDP is equal 0,27 and 0,23 respectively during 2000-2008 and 2009-2015. It means that 1% GDP growth implied PIT revenues growth and disposable income reduction by $0,27 \frac{PIT}{Y}$ in 2000-2008 and by $0,23 \frac{PIT}{Y}$ in 2009-2015.

To calculate coefficient of marginal propensity to consume out of permanent income for periods 2000-2008 and 2009-2015 data concerning individual consumption and disposable income were converted from annually to quarterly. Estimation results for equation (7) for the period 2000-2008 confirmed autocorrelation existence. As a result, relationship between individual consumption and disposable income should be estimated by the following equation:

$$\ln(C_t) = \alpha_0 + \beta_1 \ln(YP_t) + v_t \quad (10)$$

where:

$$v_{t,i} = \rho \cdot v_{t-1,i} + \eta_{t,i}, \text{ dla } i=1$$

Estimating marginal propensity to consume out of permanent income in equation (7) was statistically significant and in 2001-2008 stood at 0,86. Considering the personal consumption expenditures to disposable incomes ratio averaged at 0,65, the coefficient of marginal propensity to consume out of temporary income changes equaled to 0,56.

Table 6. Equation 10: : Cochrane-Orcutt estimation, using observations **2000:2-2007:4** (N = 31), dependent variable: **I_C**.

	coefficient	std. error	t-ratio	p-value	
const	1,52291	0,166988	9,120	5,11e-010	***
I_YP	0,865523	0,0121684	70,64	5,17e-034	***

Mean dependent var	13,32422	S.D. dependent var	0,139030
Sum squared resid	0,007369	S.E. of regression	0,015941
R-squared	0,987292	Adjusted R-squared	0,986853
F(2, 20)	4990,700	P-value(F)	5,17e-34
rho	0,095349	Durbin-Watson	1,681953

ARCH test max lag 4

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 1,17972

with p-value $P(\text{Chi-kwadrat}(4) > 1,17972) = 0,881426$

Null hypothesis is accepted.

Test for normality of residual

Null hypothesis: error is normally distributed

Test statistic: Chi-square(2) = 2,20936

with p-value = 0,331316

Null hypothesis is accepted.

*** Variable significant at significance level of 1%.

Source: Calculations performed using GRETl.

Table 6a. Equation 10: Augmented Dickey-Fuller test for uhat including two of (1-L) uhat, sample size 31.

Unit-root null hypothesis: $\alpha = 1$
model: $(1-L)y = b_0 + b_1 \cdot t + (\alpha - 1) \cdot y(-1) + \dots + e$
1st-order autocorrelation coeff. for e: -0,218
estimated value of $(\alpha - 1)$: -0,836881
test statistic: $\tau_{ct}(2) = -5,01101$
asymptotic p-value $p = 0,007164$
critical value for the Dickey-Fuller test = -3,50 at the significance level of 5%
Unit root does not exist. There is evidence for a cointegrating relationship.

Source: Calculations performed using GRETl.

Estimation results for equation (7) for the period 2009-2015 also confirmed autocorrelation existence. As a result, relationship between individual consumption and disposable income should be estimated by the following equation:

$$\ln(C_t) = \alpha_0 + \beta_1 \ln(YP_t) + \psi_t \quad (11)$$

where:

$$\psi_{t,i} = \rho \cdot \psi_{t-1,i} + \eta_{t,i}, \text{ for } i=1$$

The estimation of equation (11) for the period 2009-2015 points statically significant relation between individual consumption and disposable income. Considering that marginal propensity to consume out of permanent income equaled to 0,77 and personal consumption expenditures disposable incomes ratio was of 0,61 in 2009-2015, marginal propensity to consume out of temporary income changes was 0,47.

Table 7. Equation 11: Cochrane-Orcutt estimation, using observations **2009:2-2015:4** (N = 27), dependent variable: **l_C**.

	coefficient	std. error	t-ratio	p-value	
const	2,87959	0,533687	5,396	1,34e-05	***
l_YP	0,773755	0,0374911	20,42	4,16e-017	***

Mean dependent var	13,77415	S.D. dependent var	0,073366
Sum squared resid	0,006171	S.E. of regression	0,015711
R-squared	0,955909	Adjusted R-squared	0,954145
F(2, 20)	416,8356	P-value(F)	4,16e-17
rho	-0,118588	Durbin-Watson	2,153441

ARCH test max lag 4

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 0,522997

with p-value $P(\text{Chi-kwadrat}(4) > 0,522997) = 0,971224$

Null hypothesis is accepted.

Test for normality of residual

Null hypothesis: error is normally distributed

Test statistic: Chi-square(2) = 3,89945

with p-value = 0,142313

Null hypothesis is accepted.

*** Variable significant at significance level of 1%.

Source: Calculations performed using GRETL.

Table 6a. Equation 11: Augmented Dickey-Fuller test for \hat{u}_t including two of (1-L) \hat{u}_t , sample size 27.

Unit-root null hypothesis: $\alpha = 1$
model: $(1-L)y = b_0 + b_1 \cdot t + (\alpha - 1) \cdot y(-1) + \dots + e$
1st-order autocorrelation coeff. for e: 0,097
estimated value of $(\alpha - 1)$: -1,42869
test statistic: $\tau_{ct}(2) = -8,08374$
asymptotic p-value $p = 1,001e-005$
critical value for the Dickey-Fuller test = -3,50 at the significance level of 5%
Unit root does not exist. There is evidence for a cointegrating relationship.

Source: Calculations performed using GRETL.

Considering estimation of short term elasticity of employment with respect to GDP and short term elasticity of the average salary with respect to employment and basing on equation (9) short term elasticity of social security contributions with respect to GDP coefficient was obtained on the level of 0,24 in 2000-2008 and 0,19 in 2009-2015.

Finally, the following conclusion can be obtained based on equation (1): short term GDP growth by 1% leads to growth of Tax revenues obtained from labor income (social security contributions plus personal income taxes on labor income) which results disposable income and individual consumption reduction by 0,03% GDP in 2000-2008 and 0,008% GDP in 2009-2015.

3. Impact of tax progressivity on output stabilization in Poland

The theoretical evidence discussed in this paper suggests that higher tax progressivity leads to lower consumption and output volatility.

In the countries with progressive taxation, decrease of tax revenues during recession is bigger than disposable income decrease. It means that GDP decreases faster than disposable income at households level and the decrease of global demand is smaller than the decrease of GDP would suggest. Automatic nature of tax system stops fall in output and employment (Ujwary-Gil, Nalepka, (2010), p. 349).

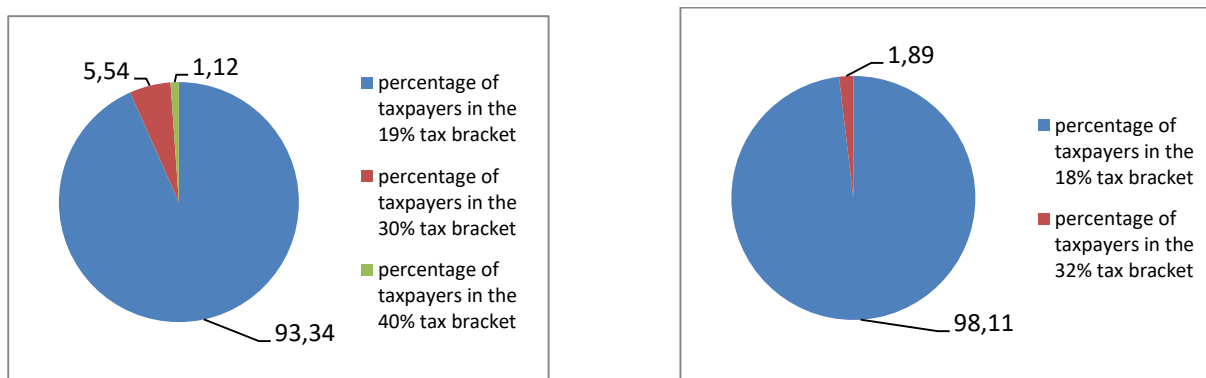
The income elasticity of tax system reflects its progressivity. A tax system is considered elastic if, with an unchanged tax structure, the incremental tax revenue/national income ratio is greater than the average tax revenue/national income ratio (D.P. Ghai, (1966), p. 16).

Starting January **2009**, **two personal income tax (PIT) rates** were applied in **Poland**: 18% and 32% instead of heretofore obtained: 19%, 30% and 40%. Such change in the tax construction should lead to lower tax progressivity and lower automatic stabilization in the same time. The real impact of personal incomes progressive taxation on diversity of incomes after tax depends not only on formal shape of tax schedule but also on some economic factors concerning a taxpayer economic position. Among the latter are:

- diversity of pre- tax incomes,
- income distribution as per particular tax bracket,
- change of pre-tax income,
- utilization of tax relief and exemption by low and high income taxpayers.

The level of PIT progressivity depends on distribution of taxpayers` incomes in existing tax brackets. It means that the bigger number of taxpayers are located in one income tax bracket, the lower ability to attain a more equal distribution of income, wealth and consumption. In this context simplifying tax structure and leaving only two brackets, set at 18% and 32% in 2009 only slightly reduced PIT progressivity.

Figure 1. PIT revenues structure by the income level in 2006 and in 2010.



Source: Ministry of Finance Dataset, *Informacja dotycząca rozliczenia podatku dochodowego od osób fizycznych za 2006 i 2010 rok*, p. 2.

Figure 1 shows that PIT progression after 2009 relates only to 2% of taxpayers. It is three times less than in case of three tax brackets. Nevertheless, it is worth underlying that for the majority of taxpayers, personal income tax, despite its progressive nature, has been a flat tax with one rate: 19 and 18%.

To examine if PIT structure simplification from 2009 made lower efficiency of PIT in stabilizing consumption and output fluctuations, results of empirical research from part 2.2 were used.

Table 5 shows coefficients estimated to asses the efficiency of PIT as automatic stabilizer during 2000-2008 and 2009-2015.

Table 7. Estimated coefficients for assessing PIT efficiency as automatic stabilizer for periods: 2000-2008 an 2009-2015.

period	$\varepsilon_{E,Y}$	$\varepsilon_{W,E}$	$\varepsilon_{PIT,W}$	$\varepsilon_{PIT,Y}$	$\varepsilon_{SUS,Y}$	cp	$\frac{\Delta C}{\Delta Y}$
2000-2008	0,15	0,58	1,36	0,27	0,24	0,56	0,03 (0,016)*
2009-2015	0,05	2,79	1,32	0,19	0,19	0,47	0,008 (0,002)*

* In brackets efficiency of PIT as automatic stabilizer was estimated on basis of equation (1).

Source: Results of empirical research from part 2.2.

Table 7 presents the estimation results for the effects of social security contributions and personal income taxes on labor income on smoothing output fluctuations. It can be noted that PIT and social security contributions effectiveness as automatic stabilizers was four times lower in 2009-2015 than in 2000-2009. Smaller value of elasticity of PIT revenues out of GDP coefficient in 2009-2015 confirms lower progressivity of PIT.

According to Keen et al. reducing the number of PIT rates does not always lead to weaken the stabilizer if the income increases (lack of thresholds` indexation) and income tax deductions are introduced in the same time (Keen, et al., (2006), p. 31-33). According to Central Statistical Office inflation in Poland in 2009-2015 rose by 15,9% while minimum remuneration by 32% and tax allowance remained at the same level. Lack of tax allowance indexation with minimum remuneration growth means that ratio of untaxed income to minimum annual remuneration is getting lower so the real value of paid tax is higher. The result of lower tax progression after 2009 was reduction of households` disposable incomes which confirms lower elasticity of PIT revenues with respect to GDP rate in 2009-2015. According to The Centre of Economic Analysis, keeping tax allowance frozen will

lead to decrease in Polish households' incomes by 2,90 mln in 2016 and 4,76 mln in 2017. For low income households keeping tax allowance frozen will lead to income loss by 0,6% on average over three following years and for high income households by 0,8% (Pienczykowska, 2014).

Progressivity also depends on utilization of tax reliefs and exemptions by lowest income taxpayers. In case when low income taxpayers are subject to tax relief and tax exemption, tax progressivity is higher because effective personal income tax rate is lower than marginal personal income tax rate.

Table 8. Utilization of tax reliefs in 2006 and 2010.

Threshold	Percentage of taxpayers	Percentage of gross income before tax reliefs	Percentage of tax reliefs utilization
I	93,34	74,53	81,25
II	5,54	16,68	11,22
III	1,12	8,79	7,53
I	98,11	88,87	94,08
II	1,89	11,13	5,92

Źródło: Ministry of Finance Dataset, *Informacja dotycząca rozliczenia podatku dochodowego od osób fizycznych za 2006 i 2010 rok*, p. 11-14 and p. 10-14.

Table 6 shows that tax structure simplification in 2009 made personal income tax less progressive. The main reason is that the subject of tax reliefs are basically lowest income taxpayers who receive 90% of taxable income, represent over 98% of all taxpayers and deduct from income around 95% of all reliefs.

Conclusions

Keeping public finance in line with stability according to Stability and Growth Pact and the recent financial and economic crisis has revived the discussion on the role that governments may have in smoothing out business cycle fluctuations. Several empirical studies test either the hypothesis that large governments are better able to withhold output fluctuations or they assess the sensitivity of government expenditures or revenues to the business cycle. However, a largely absent piece in the literature is the direct relationship between tax progressivity and output volatility. The aim of this paper has been to examine the impact of personal income tax and social security contributions in stabilizing the economy in Poland in 2000-2008 and 2009-15 and also to investigate empirically the effect of personal income tax progressivity on output volatility.

The paper finds supportive evidence for the hypothesis that higher tax progressivity leads to lower output volatility. It means that reducing the number of tax rates in 2009 in Poland weaken PIT as automatic stabilizer. Increase in real earnings and lack of tax allowance indexation in 2009-2015 weakened the effects of declining in PIT progressivity. It means that output fluctuations were affected more by real earnings changes than employment changes.

Abstract

The goal of this paper is to examine the impact of personal income tax and social security contributions in stabilizing the economy in Poland in 2009-14 and also to investigate empirically the effect of personal income tax progressivity on output volatility. The methodology to assess stabilizing function of personal income tax and social security contributions was based on short term output elasticities of these budget categories estimates. Although generally weak stabilizing effectiveness of personal income tax and social security contributions, the paper finds empirical evidence for the hypothesis that the decrease in the automatic stabilizers that can be realized from reasonable decreases in the level of PIT progressivity is modest.

Keywords: progressivity, personal income taxes, output volatility, automatic stabilisers.

JEL classification: E63, E32, H10.

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Quality of non-financial information reported by financial institutions. The example of Poland and Greece

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Abstract

This paper aims to analyse and verify the applicable principles of Corporate Social Responsibility (CSR) reporting in light of the regulations of Directive 2014/95/EU, as well as to evaluate quality of non-financial information presented in CSR reports of financial institutions in the Polish and in the Greek market.

Two research hypotheses have been postulated in connection with this aim:

(H1) - The Directive 2014/95/EU contains regulations that will contribute to improved comparability and usefulness of information presented in financial statements.

(H2) - financial institutions in the Polish and in the Greek market draft their CSR reports in different ways, which obstructs their comparability.

In order to verify hypothesis (H1), regulations of the Directive 2014/95/EU and specialist literature have been reviewed.

In order to verify hypothesis (H2), the author has conducted research into a group of financial institutions in the Polish and in the Greek financial market by examining and analysing CSR reports compiled in 2010-2015 with regard to quality of the information, in particular, its usefulness and comparability. This assessment involved reviewing of: principles of publication and verification of the reports, frequency of their drafting, volume, scope and structure.

Key words: accounting, reporting, financial statement, Corporate Social Responsibility (CSR).

Introduction

Non-financial reports are significant sources of information used in decision-making processes. It is therefore important that they meet appropriate qualitative criteria that ensure comparability and faithful presentation. Existing research points to qualitative deficiencies of CSR (*Corporate Social Responsibility*) reports with regard to comparability: Elkington, Spencer-Cooke (1997), Gray (2007), Adams (2008), DeSilva (2008), Horehájová, Marasová (2008), Gray, Bebbington (2010), Lang, Lins, Maffett (2012), Martinčík, Polívka (2012), Szadziewska (2014), Ivanisevic, Stojanovic (2015), Lament (2015), Maraková, Lament, Wolak-Tuzimek (2015), Křištofik, Lament, Musa (2016). The issue of insufficient transparency of non-financial information, caused both by the regulatory gap and by market imperfections, is one of the subjects addressed in research

undertaken by the European Commission (*Report on Corporate Social Responsibility: promoting society's interest and a route to sustainable and inclusive recovery (2012/2097/INI)*). *Report on Corporate Social Responsibility: accountable, transparent and responsible business behaviour and sustainable growth (2012/2098/INI)*. The Directive 2014/95/EU, which lays down principles of compiling CSR reports, is a solution to these issues, although it applies only to large entities employing more than 500 staff. Its regulations can be expected, therefore, to affect only large businesses and to contribute to improved comparability of results and usefulness of the information. Consequently, the subject can be treated as topical and requiring resolution by assessing the regulations of the Directive 2014/95/EU concerning improvement of comparability and usefulness of information presented in the reports, as well as assessment of quality of information published by financial institutions.

This paper aims to analyse and verify the applicable principles of CSR reporting in light of the regulations of Directive 2014/95/EU, as well as to evaluate quality of non-financial information presented in CSR reports of financial institutions in the Polish and in the Greek market.

Two research hypotheses have been postulated in connection with this aim:

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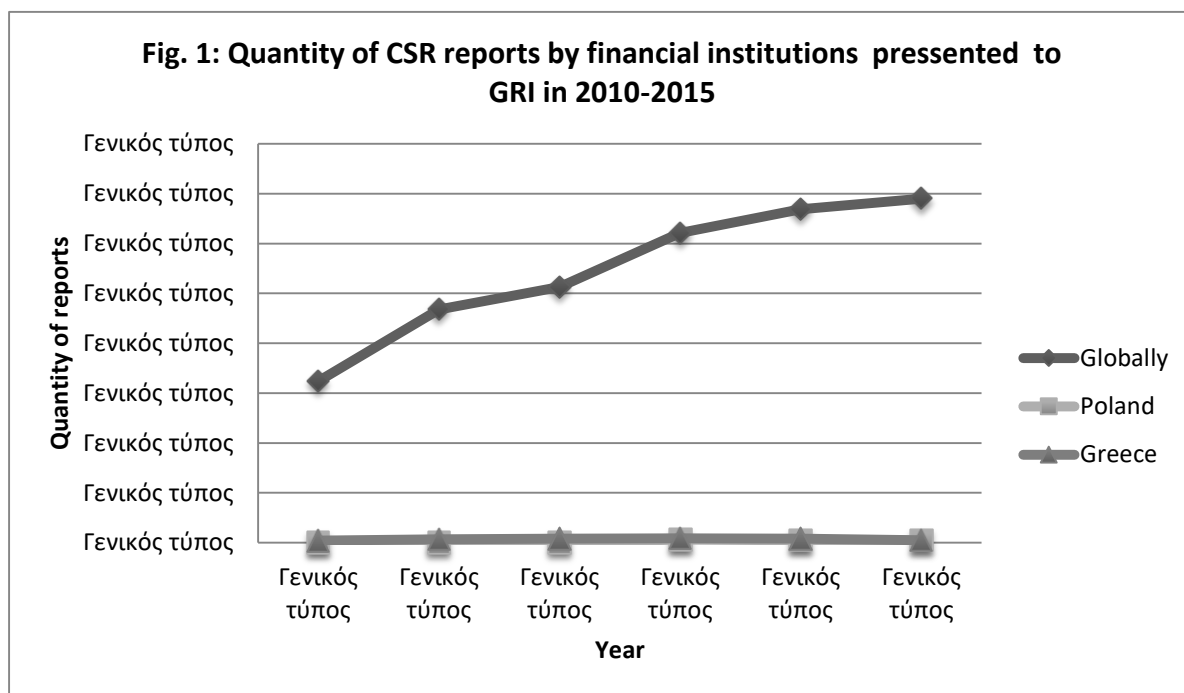
1. CSR reporting in financial institutions

The financial sector is a key industry to stakeholders, only apparently unconnected to sustainable development. This is demonstrated, inter alia, by the share of financial institutions reporting on CSR, more than 12%, coming top amongst the huge variety of sectoral reporting. Table 1 and Figure 1 show results concerning numbers of reports drafted by financial institutions globally and in Poland and in Greece, their significance in CSR reporting worldwide, as well as the share of financial institutions in the Polish and in the Greek market in CSR reporting.

Table 1: CSR reports by financial institutions presented to GRI (*Global Reporting Initiative*) in 2010-2015

Specification	2015	2014	2013	2012	2011	2010
Number of reports by financial institutions - globally	690	669	621	513	468	324
Share of financial institutions in CSR reporting worldwide (%)	12.7	12.4	12.5	11.5	13.0	12.6
Number of reports by financial institutions – Poland	5	5	6	1	0	1
Share of Polish financial institutions in CSR reporting worldwide (%)	0.72	0.75	0.97	0.20	0.00	0.31
Number of reports by financial institutions – Greece	5	8	9	8	7	4
Share of Greek financial institutions in CSR reporting worldwide (%)	0.72	1.19	1.45	1.56	1.50	1.23

Source: The author's own compilation on the basis of: GRI Database.



Source: The author's own research on the basis of GRI.

Analysis of the results in Table 1 proves numbers of CSR reports compiled by financial institutions both globally and in Poland and Greece have been raising, evidence of a growing interest in Corporate Social Responsibility and a contribution to reducing the information asymmetry.

Evaluation of the level CSR reporting can be assessed not only based on the number CSR reports, prepared by financial institutions, but also by their reference to the number of financial institutions. This is show in Table 2.

Table 2: Level of CSR reporting in banks and insurance companies from the Polish and the Greek market in 2010-2015

Specification	Country	2015	2014	2013	2012	2011	2010
Number of banks	Poland	66	64	67	68	66	67
	Greece	39	37	36	53	53	62
Number of insurance companies	Poland	57	57	58	59	61	63
	Greece	40	65	66	69	69	73
Number of CSR reports (banks)	Poland	1	4	4	3	2	2
	Greece	0	4	6	7	6	5
Number of CSR reports (insurance companies)	Poland	0	1	0	1	0	1
	Greece	1	1	1	1	0	1
Level of CSR reporting in banks (%)	Poland	1.5	6.3	6.0	4.4	3.0	3.0
	Greece	0.0	10.8	16.7	13.2	11.3	8.1
Level of CSR reporting in insurance companies (%)	Poland	0.0	1.8	0.0	1.7	0.0	1.6
	Greece	2.5	1.5	1.5	1.4	0.0	1.4

Source: The author's own research.

Analysis of the results in Table 2 shows that the level of CSR reporting in financial institutions is greater in Greece, both for banks and insurance companies.

2. Regulations of Directive 2014/95/EU and quality of non-financial information

The goal of Directive 2014/95/EU is to enhance cohesion and comparability of non-financial information disclosed by entities operating in the EU, especially as a majority of large organisations are active in more than one country. This should lead to presentation of a correct and full view of policies, results and risks of a given business. Thus, the Directive fills an existing regulatory gap and can be expected to contribute to improving comparability and transparency of CSR reporting.

Directive 2014/95/EU applies to large enterprises of public interest, i.e. quoted companies, insurance companies, banks and other organisations of public importance in view of their business profile and employing more than 500 staff on average in a financial year as at the balance closing date.

Pursuant to Article 1 section 1 item 1 of Directive 2014/95/EU, the organisations concerned shall include in their reports non-financial information, including information required to understand the development, results and position of the organisation and the impact of its operations in respect of environmental and social issues, respect for human rights, counteracting bribery and corruption, including:

- A brief description of the business model.
- A description of practices with regard to such issues, including due diligence processes in place.
- The outcomes of these practices.
- The chief risks associated with these issues and with the operations of the organisation,
- The key non-financial performance indicators relating to a given business.

Notably, reporting organisations:

- Must, as a minimum, provide explanations if they do not follow any policies in respect of the foregoing issues.
- By way of exception, may omit information about expected occurrences or matters subject to negotiations in progress if their disclosure might have a seriously adverse effect on commercial position of an organisation while having no impact on a correct and objective understanding of the development, performance and position of the organisation and the impacts of its activities.
- Can rely on national, EU or international framework principles. These should be specified in the circumstances.
- May be free from the duty to report non-financial information if they prepare a separate report which is published together with financial statements, or on the organisation's website, within six months of the balance closing date, and if financial statements contain a reference to such a report.

Analysis of the Directive's regulations shows:

1. Its scope covers only large entities; consequently, merely a narrow minority of businesses report,
2. Reporting standards may be selected from among certain specified international and EU norms of varying scopes of information. As a result, entities will report in accordance with different principles and guidelines.
3. An entity may not disclose its financials if it regards them as sensitive.
4. The compulsory verification applies only to the scope of non-financial information published and its compliance with the minimum. Non-financial information is not audited, therefore.

3. Methodology

This part of the paper aims to verify hypothesis (H2). To this end, the author has examined a group of financial institutions in the Polish and in the Greek market by analysing their CSR reports. The financial institutions that prepared CSR reports submitted to GRI (*Global Reporting Initiative*) in 2010-2015 were selected. The following issues were analysed and evaluated in particular:

- principles of reporting,
- report verification,
- reporting period,
- volume and scope of reports.

Examination subjects were 58 CSR reports (Greece – 37, Poland – 21), prepared in 2010-2015 by 18 financial institutions (Greece – 10, Poland – 8), including: 14 - banks, 2 - insurance companies, 2 - financial intermediaries. The group assessed are described in Table 3.

Table 3: Characteristics of the research group

Specification	2015	2014	2013	2012	2011	2010
Structure of CSR reports by country: <ul style="list-style-type: none"> Poland Greece 	1 (50.0%) 1 (50.0%)	6 (54.5%) 5 (45.5%)	5 (38.5%) 8 (61.5%)	4 (30.1%) 9 (69.9%)	2 (22.0%) 7 (78.0%)	3 (30.0%) 7 (70.0%)
Structure of CSR reports by financial institutions: <ul style="list-style-type: none"> banks insurance companies financial intermediaries 	1 (50.0%) 1 (50.0%) -	8 (72.7%) 2 (18.2%) 1 (9.1%)	10 (76.9%) 1 (7.7%) 2 (15.4%)	10 (76.9%) 2 (15.4%) 1 (7.7%)	8 (88.9%) - 1 (11.1%)	7 (70.0%) 2 (20.0%) 1 (10.0%)
Structure of CSR reports by financial institutions (Poland): <ul style="list-style-type: none"> banks insurance companies financial intermediaries 	1 (100%) - -	4 (67.0%) 1 (16.5%) 1 (16.5%)	4 (80.0%) - 1 (20.0%)	3 (75.0%) 1 (25.0%) -	2 (100%) - -	2 (67.0%) 1 (33.0%) -
Structure of CSR reports by financial institutions (Greece): <ul style="list-style-type: none"> banks insurance companies financial intermediaries 	- 1 (100%) -	4 (80.0%) 1 (20.0%) -	6 (75.0%) 1 (12.5%) 1 (12.5%)	7 (77.8%) 1 (11.1%) 1 (11.1%)	6 (85.7%) - 1 (14.3%)	5 (71.4%) 1 (14.3%) 1 (14.3%)

Source: The author's own research.

The data included in Table 3 shows that:

- CSR reporting is **more popular** in Greece than in Poland,
- **most common** reporting financial institutions are banks, both in Poland and in Greece.

4. Principles of non-financial information reporting in financial institutions from the Polish and the Greek market – results

The research implies:

1. The most widely the businesses examined drafted their reports in accordance with GRI guidelines, though using different versions as modified by GRI (GRI - G3 or GRI - G4) – Table 4.

Table 4: Structure of CSR reporting in financial institutions from the Polish and the Greek market in 2010-2015 by principles of reporting

Specification	2015	2014	2013	2012	2011	2010
All examined financial institutions:						
• GRI –G3	2 (100%)	7	7	10	8	7
• GRI – G4	-	(63.6%)	(53.8%)	(76.9%)	(88.9%)	(70.0%)
• Non GRI	-	3	4	-	-	-
		(27.3%)	(30.8%)	3	1	3
		1 (9.1%)	2	(23.1%)	(11.1%)	(30.0%)
			(15.4%)			
Poland:						
• GRI –G3	1 (100%)	6 (100%)	2	4 (100%)	2 (100%)	3
• GRI – G4	-	-	(40.0%)	-	-	(100%)
• Non GRI	-	-	3	-	-	-
			(60.0%)			-
			-			
Greece:						
• GRI –G3	1 (100%)	1	5	6	6	4
• GRI – G4	-	(20.0%)	(62.5%)	(66.7%)	(85.7%)	(57.1%)
• Non GRI	-	3	1	-	-	-
		(60.0%)	(12.5%)	3	1	3
		1	2	(33.3%)	(14.3%)	(42.9%)
		(20.0%)	(25.0%)			

Source: The author's own compilation on the basis of: CSR reporting financial institutions.

- The CSR reports were subject to external verification. 32 reports were not verified (Poland – 8, Greece – 24), which accounted for 55.2% of CSR reports (Poland – 38%, Greece – 64.9%).

In individual years, the percentage of reports not [were verified is as follows](#): (Table 5)

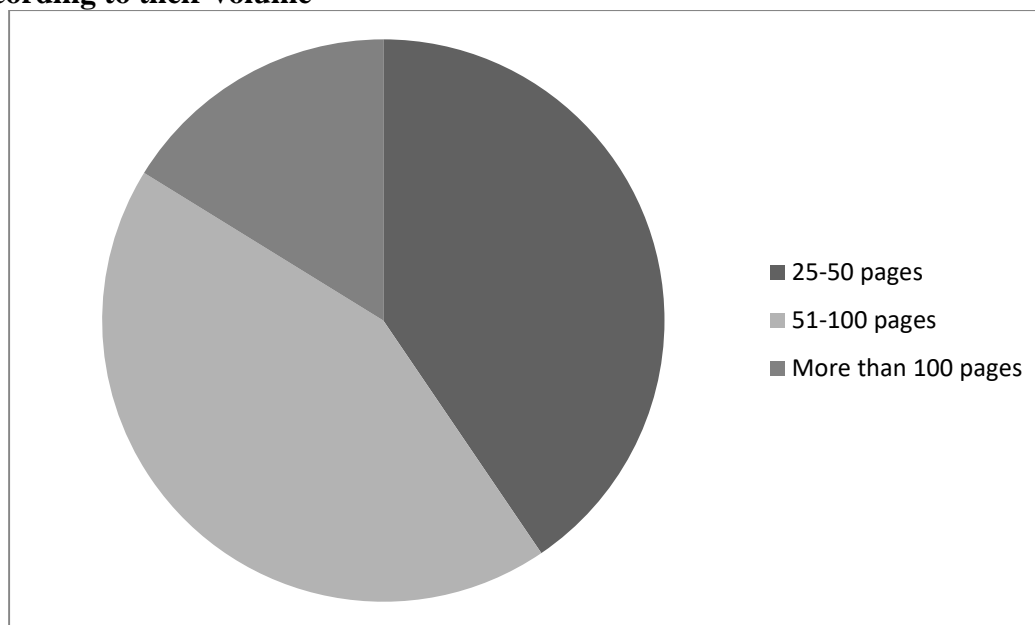
Table 5: Structure of CSR reporting in financial institutions from the Polish and the Greek market in 2010-2015 as per the verification criterion

Specification	2015	2014	2013	2012	2011	2010
All examined financial institutions:						
• verified reports	1	7	6	5	4	3
• unverified reports	(50.0%)	(63.6%)	(46.2%)	(38.5%)	(44.4%)	(30.0%)
	1	4	7	8	5	7
	(50.0%)	(36.4%)	(53.8%)	(61.5%)	(55.6%)	(70.0%)
Poland:						
• verified reports	1 (100%)	5	3	2	1	1
• unverified reports	-	(80.0%)	(67.0%)	(50.0%)	(50.0%)	(33.0%)
		1	2	2	1	2
		(20.0%)	(33.0%)	(50.0%)	(50.0%)	(67.0%)
Greece:						
• verified reports	-	2	3	3	3	2
• unverified reports	1 (100%)	(40.0%)	(37.5%)	(33.3%)	(42.9%)	(28.6%)
		3	5	6	4	5
		(60.0%)	(62.5%)	(66.7%)	(57.1%)	(71.4%)

Source: The author's own compilation on the basis of: CSR reporting financial institutions.

3. Most businesses compiled their CSR reports for one year – 51 CSR reports, which accounted for 87.9% of all the reports (Poland – 16 CSR reports – 76.2%, Greece – 35 CSR reports – 94.6%). Bi-annual reporting was adopted in 7 cases (Poland – 5, Greece – 2), 12.1% of the total (Poland – 23.8%, Greece – 5.4%).
4. Volume of the CSR reports ranges from 25 to 146 pages. Structure of the CSR reports for financial institutions from the Polish and the Greek market according to their volume is presented in Figure 2 and Figure 3.

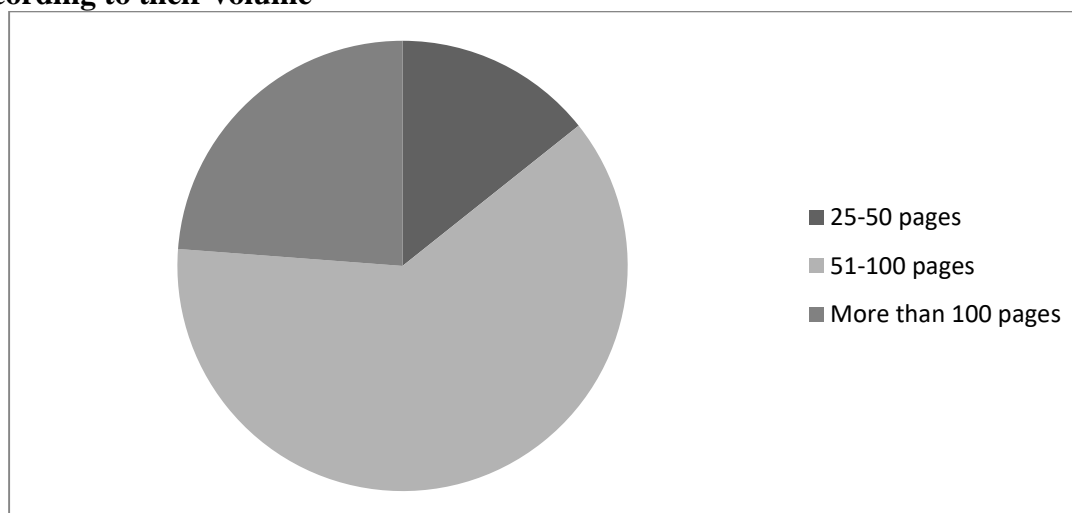
Fig. 2: Structure of the CSR reports in financial institutions from the Greek market according to their volume



Source:

The author's own compilation on the basis of: CSR reporting financial institutions.

Fig. 3: Structure of the CSR reports in financial institutions from the Polish market according to their volume



Source:

The author's own compilation on the basis of: CSR reporting financial institutions.

5. Shared element can be distinguished, however, arising from application of identical standards, e.g. social actions, natural environment, employees, action strategy, etc. Incomparability of CSR reporting concerns not only different entities but also periods of reporting by the same businesses. Scopes of the CSR reports vary, though they are drafted following the same guidelines.

Conclusion

The author's research discussed in this paper has helped to verify the working hypotheses:

(H1) - Directive 2014/95/EU contains regulations that will contribute to improved comparability and usefulness of information presented in financial statements.

Regretfully, provisions of the Directive do not solve the existing problems related to assuring adequate quality attributed of CSR reports. This is due both to the subjective scope of the Directive, covering solely large businesses, and its objective scope, as it offers freedom of choice of reporting principles, fails to impose the duty of verifying non-financial data, allows for omission of sensitive data, and fails to provide for sanctions.

Directive 2014/95/EU must be therefore assumed to fill a regulatory gap yet will contribute to improvement of CSR reports' quality to a limited extent, chiefly in respect of comparability and clarity.

(H2) - Financial institutions in the Polish and in the Greek market draft their CSR reports in different ways, which obstructs their comparability.

This is affirmed by the author's research, which indicates CSR reports vary with regard not only to entities but also to reporting periods by the same businesses. Major differences relate to: principles and areas of the reporting, frequency and volume of the reports, as well as their verification.

It must be concluded neither the existing regulations nor the reporting practices ensure the qualitative features in question. As a consequence, CSR reports are incomparable and unclear.

Introduction of sectoral reporting standards in future should be considered, as it would help to improve clarity and comparability of the reports.

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Stock Exchange bonds as a source of financial capital for firms in Poland and in selected countries of UE.

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Abstract

The article presents the characteristics of the bonds as a source of capital for the companies. Analysis of the stock exchange bond markets in the selected countries is also carried out. Moreover, based on the analysis of the size of capital raised through the stock exchange bond issues, author tries to assess the importance of this form of raising capital in the selected countries. Verification of hypotheses was based on literature studies and analysis of statistical data from 1999 to 2013.

J.E.L. classification: G1, G3

Key words: stock exchange, corporate bonds, bank credit.

Introduction

Choosing the right source of capital is one of the key decisions for firms, especially as they may use various sources of capital supply, depending on their needs (issue of shares and bonds, debt securities, bank loans, venture capital, leasing, factoring and other).

One of the important sources of capital is a stock exchange where companies can place the issues of shares and/or bonds and increase respectively equity capital or outside capital. Stock Exchange is the main competitive source when it comes to raising capital in relation to the banking sector and its loans.

Therefore, it seems worth to analyze the role of the stock exchange bond issues in corporate financing in the countries of the European Union, including Poland. The aim of the study was to investigate the volume of the bond issue as a source of corporate financing in Poland and in selected European Union countries (France, Greece, Ireland, Germany, Great Britain). Stock Exchange is an important place through which companies can raise capital in the form of new issues of shares and/or

bonds. However, the importance of stock exchange in the economy can vary and may depend on the financial system of the given country, the level of financial development and economic development or alternative methods of raising capital (primarily long-term bank loan). Therefore, the paper proposes the following research hypothesis: Issuance of corporate bonds is less important as a form of raising capital in the countries of continental Europe (including Poland) than in countries with Anglo-Saxon model, which is conditioned by a greater role of bank credit as a source of funding. The higher the level of financial development and economic development of the country, the tendency of companies to raise capital from the stock exchange is usually greater.

1. Bonds as a financial instrument listed on the stock exchanges

The bonds are widely used as a capital market instrument. Bond issuers offer them to the investors in order to raise capital for investments, infrastructure development, financing the deficit and budget expenditures, or to subsidize the developing countries that are members of economic communities. Polish Act on Bonds defines bond as "a security issued in the series, in which the issuer states that it is indebted to the bond owner (bondholder) and is committed to meet certain performance" (see: Act on Bonds 1995, pos. 1300).

W. Dębski depicts bonds as "security certifying the claim, which is a debt obligation of the issuer to its owner on a certain amount, together with a commitment to pay interest at fixed dates. It may also contain an obligation of the issuer to the specified non-cash benefit." (see: Dębski 2007, p. 234).

W. Bien specifies bonds as securities in which "the issuer confirms taking out a certain amount of the loan and undertakes to return it to the owner of bonds at a predetermined time and to pay interest" (see: Bien 1999, P.31).

The economic role of bonds as a security is implemented through a set of functions that it meets as an instrument of the capital market. Among the main features of the bond you can list the following functions: credit, investment, circulation, payment and warranty (see: Antkiewicz 2011, p. 44).

The parameters which determine the characteristics of each bond are the nominal value of bond, its maturity and interest. The nominal value of the bonds - face value, assigned to the bond amount representing the amount of credit granted to their issuer. It is the basis for the calculation of bond interest. In the period from the issue of the bond till the maturity the face value doesn't change and when maturity date comes, nominal value shall be returned to the bond holder. Hence, the maturity date is the period after which the debtor should pay the borrowed money represented in bonds. In terms of the issue, the issuer may determine the rules of early redemption of the bonds. The process of redemption may be one-off or in installments. In the latter case, which series of bonds will be subject to a redemption is typically decided by a draw. As for interest, it represents a benefit for the

bond holder for borrowing his money to the company that has issued these bonds. Regular interest payments can give the bondholder steady income, independent of the performance of the issuer profits. They are regularly paid during the periods and amounts determined in terms of the issue (except for zero-coupon bonds). Principles of charging interest should be available to investors at the moment of issuance of bonds (see: Dębski 2007, pp. 235-238).

There are many types of bonds in the exchange-traded and over the counter markets. The criteria of classification can be a type of the issuer, type of interest rates, time to maturity or the legal rights. Taking into account the criterion of the issuer W. Bien distinguished types of bonds such as government bonds called treasury bonds, financial institutions bonds eg. banks, insurance companies, government bodies bonds or municipal bonds, public enterprises bonds - post office, railway bonds and finally bonds issued by other companies and institutions (see: Bień 1999, p. 38).

W. Dębski proposes more concise selection that divides bonds into treasury, municipal and enterprises bonds (see: Dębski 2007, pp. 238-240).

On account of the way interest rates are calculated, bonds can be divided into bonds with a fixed interest rate, which give the holder steady and regular income (when issuer his obligation). Throughout the period the interest rate does not change. Zero-coupon bonds are bonds without interest coupons, interest is not paid on it. Profit for the bondholder lies in the fact that he buys them at a significant discount to their nominal value. Bonds with floating interest rate - the amount of income for the creditor is not pre-determined. Only the general method of calculating interest is known. The amount to be paid is known only for a short period before the due date. The purpose of issuing interest-bearing bonds is to provide investors with a defined purchasing power of capital they invested, in the case of high inflation and rising interest rates. The interest rate can be determined on the basis of the interbank market interest rates (LIBOR, WIBOR 3 or 6 months), the interest rate of treasury bills (52-week) or profitability of swaps. Bonds with an indexed interest rate - a percentage value is based on the given index or ratio, which must be specified in the contract of issuance. This may be the price index in a given period (e.g. 1 year) or the rate of return in the certain period for the chosen goods e.g. gold (see: Antkiewicz 2011, pp. 40-41).

Bonds can be also divided into short-term bonds - with a maturity date of up to 5 years, medium-term bonds - with a maturity of from 5 to 10 years, and long-term bonds - maturing over 10 years. It is worth noting that this type of classification isn't fixed permanently and it is hard to point out just one correct classification (see: Najlepszy 2000, p. 401). For example, In Poland short-term bonds are considered to be bonds with a maturity of up to one year, while medium- and long-term bonds have maturity over 1 year.

According to the criterion of legal rights linked to bonds, we can divide bonds into ordinary bonds, which do not have special rights and privileges. They are widely used on the secondary market in dematerialized form (e.g. in Poland these type of bonds is traded on the Warsaw Stock Exchange and Over-The-Counter regulated market which has been running since 2009 and it is organized by two institutions in the form of two markets for the specific group of investors - Catalyst and Bondspot). Next type of bonds are convertible bonds. This type of financial instrument gives the owner of these bonds the right to convert them in the near future into shares of the company. This type of bonds feature all the basic characteristics of classic bonds with the additional option, which gives the right to convert them into shares of the issuer (see Taylor et. Al., Pp. 4). The benefactors from this type of issue are usually still-developing, early-stages firms, mainly due to profits this type of issue can bring: lower interest rate, conversion of debt into share/equity capital, less stringent conditions of issuance than other bonds (see: Dębski 2007, pp. 242-246). Also, companies with a strong financial position use this form of supply of financial capital, precisely because of the lower cost of the convertible bond issue, despite the fact that they easily could issue shares or regular bonds. Moreover, convertible bonds as a form of borrowing financing lowers the total cost of capital due to the tax shield (reduction of the tax base of the deductible, which is interest on liabilities). Convertible bonds may also increase the credibility of the company, and consequently the credit standing of the company, which may result in easier possibilities to raise new funds in the future, if necessary (see: Brealey et. Al. 2001, pp. 507-508). In addition, convertible bonds have a low cost of ongoing maintenance of financing, allow the issuer more flexibility in shaping the indicator of capital structure, and if it is incorporated in them - the option of early redemption. Moreover, the conversion into shares reduces the size of the debt and the company may incur new debt (see: Antkiewicz 2011, p. 85).

Among the convertible bond, we can distinguish mandatory bonds (they require bondholder to convert them into shares at maturity, popular in the United States) and reverse convertible bonds (the right to choose how to redeem these bonds - either by returning the nominal amount together with coupons, or by convert them into shares - is entitled to the issuer, not the bondholder. In return, the issuer offers investors a higher interest rate) (see Brown 2006, pp. 9-26).

Other types of bonds can include unsecured and secured type of bonds. Unsecured bonds are described by higher risk and should offer a higher rate of return for investors (see: Fabozzi 2002, pp. 251-282). Among the covered bonds can be distinguished retail bonds - available to all investors through brokerage houses, internet, banks and other intermediaries; and on the other hand - wholesale bonds available, exclusively at auctions in the primary market, to institutions and to investors who are able to meet certain requirements and who have permission to participate in this type of auctions (see: Mishkin et. al. 2006, pp. 245-256).

2. Corporate bonds issued on stock exchange

Issue of securities by the company, whether in the public market or the private one involves a change in its capital structure, which in turn may also lead to changes in the ownership structure of the company. Company can issue ordinary shares, preference shares, corporate bonds or convertible bonds. Issuance of long-term securities contributes to company's need for development capital, causing at the same time a change in ownership structure (in the case of the issue of shares) or the level of long-term debt (in the case of a bond issue). These changes must be taken into account by the current owners, who must be able to examine not only, whether it is worthwhile to go this route in order to gain financial capital, but also what can the consequences be and what impact will it have on the continued operation of the company. The public issue of financial instruments requires adequate preparation. The company must have to undertake a series of steps, in order to find buyers for its stocks in the public market and bring the new capital in. The issue of securities is determined by many factors that contribute to the final success. This is related to the functioning of the public market itself, political, economic, organizational, legal and historical framework that exist in a given market. Introduction of financial instruments to public trading, is associated with the fact that they must meet a number of formal and legal requirements in order to be admitted to public trading. The very design of public trading imposes on the issuer a lot of organizational and informative responsibilities it has to meet. Although, there are few cases where the public issue of securities is not finalized with listing them on the stock market, the vast majority of newly issued financial instruments is traded on an organized regulated market.

Among the reasons that lie behind the public offering of financial instruments it seems necessary to include the following: the desire to raise capital for growth, the prospect for better access to capital funds in the future, the ensuring improved liquidity of shares, the changes in the management of the company, the marketing effects on company and its products or services (see: Nawrot, 2010 p. 25), as well as a merger with a company already listed on the stock exchange, if that was the plan in the first place (see: Pagano et. al. 1998, pp. 27-64).

W. Milo states that the factors of issuance can include, inter alia, the need to obtain new capital (the most common and natural motive of companies deciding to issue securities), the need for impartial valuation of a company, which is on the market, cancellation of debt processes and rebuying of the shares by the issuer (see: Milo 2000, pp. 100-105).

Further reasons for the issue of capital market instruments can also include easier access to new sources of capital, low cost of capital, increase in the credibility of the company - the fact of having the status of a public company listed on the regulated market creates some kind of prestige in the eyes of potential investors, which may result in easier access to other sources of financing,

previously beyond the reach of the company. Also, the possibility of acquiring a strategic investor may be the factor that will influence the decisions of the public issue of securities, as the status of a public company gives the firm an advantage and relatively eases the search for a strategic investor, when the company is looking for funds to finance its further development and research or is looking for technological support (see: Poślad et. al. 2006, pp. 27-39).

In addition to the above-mentioned reasons of financial instruments issuance W. Nawrot also points out to other factors that company should also consider. She Indicates: investment strategies of holders of shares, the stock market situation, the risks associated with the instruments and the political and macroeconomic situation (see: Nawrot, 2010 p.27).

Securities market plays an important role in the financial system of free market economies. Through its functions it facilitates allocation of individual's capital from those with a surplus to those which demand it. The stock exchange in its function of concentration of capital facilitates the meeting of the supply side with the demand side amidst the clear conditions. Well developed securities market can provide favorable conditions for economic growth by influencing the level of investment and savings, and the absorption of economic shocks (see: Bukowski 2009, p. 16; Bukowski 2009 (II), pp. 186-188; Kosztowniak 2011, pp. 271-280; Pszczółka 2013, pp. 75- 77). The changes in stock market conditions have a significant impact on investors' decisions, and hence on the ability to raise capital on the stock exchange by concerned companies. It seems that during the bull market on the stock exchange it is much easier for companies to obtain financial provisioning, find investors, and thus fulfill the established goal for the issue. Reverse trend occurs during a "bad" stock market situation - a bear market. There are more parties willing to sell securities and to modify its portfolio as well as to seek alternative sources of investment (see: Mishkin, 2001, pp. 1-2).

Issuance of corporate bonds is a source of external financing of enterprises. A bond is a debt instrument of long-term financing and can be considered as a main alternative (along with issuance of stocks) of bank credit. The public issue of bonds by the company is the issue of debt with a nominal value, from which issuer is obliged to pay the bondholder interest and return the borrowed capital at a fixed time. Further details of the issuance like installments or the lack of them (in the case of zero-coupon bonds), the maturity period and the implementation of additional rights arising from holding a bond (e.g. from convertible bonds or warrants), securing a bond issue or not, the amount of interest paid and the frequency of it are key elements of the issue, which may determine its success (see: Fabozzi 2000, pp. 165-205). By conducting appropriate market analysis the company can obtain financial empowering relatively cheaply. As in the case of a public issue of shares, so in the case of a public bond issue the company must meet certain requirements and regulations in order to be admitted onto the public market. The company that wishes to offer bonds to the investor in the public

market must use the brokerage house or investment firm as a intermediary, which will carry the company through all stages of the issue. In the case of bond issues the expected profits of prospective buyers are of key importance. These yields are equal to bond's interest rate. The company should establish the level of interest rates at a level that will bring investors a satisfactory rate of return on investment, while not exposing themselves to the risk of inability to pay the debt. Investors who are interested in purchasing the bonds make their valuation and estimate the level of risk (see: Madura 2010, pp. 173-203). Therefore, it is important whether the company has a good rating or not. The rating of the company can determine the terms of the issue both for issuer and debtholder. The high rating can significantly reduce the cost of issuance, whereas the credit rating at the risk level (speculative) can increase the cost of issuance, as investors expect a premium for an increased level of risk that they are willing to accept (see: Brown 2006, p.118 ; Chisholm 2009, p. 72).

The issue of debt securities can be considered as a main alternative to bank credit. The characteristics of bonds, which may increase interest in this kind of instrument among issuers are primarily a diversification of funding sources, high rate of getting the funds, optionality of collateral issue. Also, there is no need for the issuer to determine the goal funds would be spend on. The ability of the issuer to establish strong relationships with institutional investors, which may result in further cooperation in the future, can be a considerable factor as well (see: Antkiewicz 2011, p. 141).

The disadvantages associated with the public offering of the bonds may include issuance costs, information obligations and the process itself being time-consuming. From the point of view of the investor risks associated with investments in bonds may involve credit risk that could lead to bankruptcy of the issuer and, consequently, not to be able to pay off its debt; the risk of reinvesting which reflect unpredictable changes in interest rates; currency risk relevant for foreign investors and the risk of purchasing power that reflects unforeseen changes in the future value of money, which can have an impact on the real bond yields (see Bailey 2005, pp. 297-298).

In the case of the corporate bond market in analyzed countries it is the most important market in the Irish economy. Its size in the years 2006-2011 exceeded 100% of GDP (with the exception of 2008). The development of this market in Ireland appears to be equally impressive. In the analyzed period, the size of the corporate bond market increased by 107,43pp. (almost 19-fold increase). In the other countries corporate bond market seems to be a market relatively insignificant, except for the economy of France (56.26% of GDP in 2011) and Greece (increase in the market over the analyzed period by 33,54pp.).

Data presented in Table 1 gives very clear view on the stock exchange bond market in Poland. Capitalization of corporate bond market in relation to GDP in Poland is the smallest of all the variables studied, and several times lower than the rate of other analyzed countries. This reflects the

low level of development of this segment of the financial market in Poland. In 1999 this ratio stood at 0.15% of GDP and in 2011 at the level of 2.07% of GDP. The share of this indicator in the Polish GDP seems negligible. Its growth in the recent years was primarily due to the start-up of organized trading by Warsaw Stock Exchange in the form of Catalyst and Bondspot markets on 30th September 2009.

Table 1. The capitalization of the corporate bonds market/GDP in % in constant prices in the period 1999-2013.

Year	Germany	Great Britain	France	Ireland	Greece	Poland
1999	58,72	18,68	35,06	6,04	0,54	0,15
2000	57,06	18,26	34,19	7,73	0,23	0,18
2001	53,04	17,28	35,24	9,38	0,17	0,22
2002	48,12	17,30	37,86	10,31	0,24	0,31
2003	46,70	17,00	40,58	30,86	1,06	0,44
2004	41,52	16,35	41,19	62,71	2,32	0,51
2005	34,92	15,08	38,31	80,99	3,89	0,52
2006	32,70	14,85	39,14	96,51	6,18	0,67
2007	35,41	15,81	46,59	102,51	8,41	0,98
2008	35,40	15,56	51,15	95,32	10,94	0,96
2009	36,51	15,93	53,78	103,98	13,43	1,20
2010	31,59	15,05	55,88	119,15	23,52	1,67
2011	24,02	12,32	56,26	113,47	34,09	2,07
2012	N/A	N/A	N/A	N/A	N/A	N/A
2013	N/A	N/A	N/A	N/A	N/A	N/A

Source: Own study based on: T. Beck, A. Demigürc-Kunt, R. Levine, *A New Database on Financial Development and Structure*, World Bank Economic Review 2000, nr 14, s. 597-605; T. Beck, A.

Demigurc-Kunt, R. Levine, *Financial Institutions and Markets across Countries over Time: Data and Analysis*, World Bank Policy Research, Working Paper 4943, Maj 2009; M. Cihak, A. Demirguc-Kunt, E. Feyen, R. Levine, *Benchmarking Financial Development around the World*, World Bank Policy Research, Working Paper 6175, August 2012; Financial structure dataset September 2015, <http://www.worldbank.org/en/publication/gfdr/data/financial-structure-database>.

Based on the available data for each year, the issuance of corporate bonds is an important source of raising capital on the stock exchange but in a small group of countries. You will notice that the stock market bonds in the Great Britain and France dominate in terms of both development and the amounts of capital obtained from the exchange. It seems that the main reason behind it may be that the internationalization of both markets, an appropriate level of liquidity of both markets, traditions of London Stock Exchange market, which in its early days traded in debt securities and a higher degree of confidence which investors have for the London market. In the case of the Euronext (one of its founders was Paris Stock Exchange), it seems that big significance at the very beginning of its functioning was mainly due to multi-quotation of instruments on the combined exchanges (Paris, Lisbon, Brussels and Amsterdam), greatly expanding a group of investors and increasing the level of market liquidity.

The amount of capital raised by the issuance of bonds on the Frankfurt Stock Exchange in Germany had shown a rising trend since 2008 and reached 6.53 bln USD in 2011. The highest value of capital raised by German companies occurred in 2003 and had a value of 355.81 bln USD.

The amount of capital raised by the issuance of corporate bonds on the London Stock Exchange in the period 1999-2008 increased almost 5-fold and reached 629.1 bln USD at the end of 2014. compared to 132.8 bln in 1999. During this period, the value of the bond issuance showed an increasing trend with an exception of 2001 and 2007.

Issue of the corporate bonds has reached significant proportions in the French stock market.. The size of capital raised in 2010 was almost 13 times higher than the amount of capital companies acquired 1999 in the form of corporate bonds.

Table 2. The value of capital raised through the issuance of domestic corporate bonds on the respective stock exchanges (main market) in bln USD in the period 1999-2013.

Year	Germany	Great Britain*	France*	Ireland	Greece	Poland
1999	205,01	132,80	36,51	1,30	N/A	0,00
2000	N/A	144,95	96,05	1,93	N/A	0,00

2001	N/A	121,29	79,82	0,88	N/A	0,00
2002	N/A	138,90	223,85	N/A	N/A	0,01
2003	320,78	195,11	2 251,26	N/A	N/A	0,01
2004	131,69	234,05	143,72	N/A	N/A	0,14
2005	N/A	265,74	165,11	N/A	0,00	0,02
2006	N/A	430,17	154,26	N/A	0,01	0,07
2007	N/A	343,49	247,24	N/A	0,00	0,31
2008	1,83	629,09	548,84	N/A	0,44	0,37
2009	4,41	399,07	518,22	0,00	0,90	0,04
2010	5,17	N/A	456,85	0,00	0,33	0,72
2011	6,53	N/A	N/A	N/A	0,00	0,75
2012	N/A	N/A	N/A	N/A	0,00	0,86
2013	N/A	N/A	N/A	N/A	0,00	1,27

Source: www.world-exchanges.org, <http://bse.hu/topmenu.>, <http://www.helex.gr>, * issues relate to the entire market, the private sector and the domestic, foreign and international issues of bonds.

In the case of Greece, the issuance of corporate bonds on stock exchange is not a significant way of raising capital for companies in the analyzed period. With the exception of 2009 the amount of capital raised from the stock market was relatively small or there was no new bonds issues. The main reason behind it seems to be the financial crisis of 2008 and subsequent deep debt crisis of the Greek economy.

As for the stock market corporate bond issues in Poland, the value of capital raised through the issuance of debt securities was incomparably smaller than the issue of shares. A significant increase in the number and value of issues from 2009 and onwards was associated with the start-up of two markets run by the Warsaw Stock Exchange and BondSpot especially intended for trading of treasury bonds, corporate bonds, municipal bonds and mortgage bonds. The first increase in the value of the bond issue occurred in 2007. Enterprises who wanted to take advantage of the prevailing period of the stock market situation decided to raise capital from the stock market, which resulted in an increase in corporate bond issuance compared to previous years. The value of the issue amounted to

307.52 mln USD in 2007 and in 2008 it was 373.56 mln USD with both values greater than in year 2006 respectively by 239.9 mln USD (more than 3.5-fold increase in the value of issues) in 2007 and by 306 mln USD (more than 5.5-fold increase in the value of issues) in 2008. The decrease in the value of issues in 2009 was in turn due to the fact that vast majority of issuers went with the issues on Alternative Trading Platform (ATP). However, a considerable increase of interest in the main market for bonds can be seen since 2010, which resulted in a steadily increasing value of capital raised through the issuance of corporate bonds on the regulated market. The number of new corporate bond issues was 63 in 2012. It exceeded the equivalent of 1 bln USD obtained in 2013. The growing trend was maintained in 2014, in which the value of capital raised from the issuance of corporate bonds amounted to 1.4 bln USD. In relation to 2009 this is a huge increase in value of capital raised by issuance of corporate bonds in Poland. The value of capital raised in 2014 compared to 2009 increased almost 40-fold.

A thorough analysis of the amount of capital companies acquired from corporate bond issues on the stock exchange is unfortunately hampered by the unavailability of statistical data. There are series of data, but they are incomplete or, as in the case of Ireland data series is very short, which makes it impossible to make a full analysis for these exchanges and only a partial analysis for given exchanges can be carried out.

At the same time it must be noted that the corporate bond market in Poland is mainly based on private market bond issues organized on the interbank market. Whereas the public corporate bond market had its beginning in 2000, when the Warsaw Stock Exchange carried out the first issue of corporate bonds of the Centrum Leasingu i Finansów Clif S.A. Company. In the following years, the number and size of corporate bonds on the Warsaw Stock Exchange did not undergo significant changes. The exception is 2004 during which the 18 issues amounted for a total of 136.73 mln USD. It was 11-fold increase compared with the previous year. This resulted primarily from the Polish accession to the European Union. However, in the next two years, the volume of capital raised from the stock in the form of issuance of corporate bonds was significantly reduced to 22 mln USD in 2005 and 67 mln USD 2006. In 2007 and 2008 the value of issuance exceeded in both years 300 mln USD making good use of ending bull market. It is also worth noting the 2008 issuance which amounted to over 373 mln USD. This could be due to the fact that the stock market was uncertain and unstable at the time. A significant decrease in issues in the bond market occurred only in 2009 with the total amount raised of 35.96 mln USD. The number of new corporate issues carried out on regulated market in Poland also differ from year to year. There was 37 issues in 2010 resulting in acquiring capital equivalent to 722.98 mln USD. The largest number of issues was carried out in 2008 with 63 issuers. In turn in 2013 value of the issue for the first time exceeded 1 billion USD (1,27 bln USD from 41

issues). The largest percentage of issued bonds represents corporate bonds issues. In 2013 41 out of 47 issues were corporate bonds issues and in 2014 51 out of 53 of total issues were carried out by firms. The increase in issuance in recent years seems to be affected by increased interest in this form of raising capital, as well as, keeping the main interest rates at a low level (which leads to a reduction in the cost of capita) and the desire to diversify sources of funding.

However, the positive picture of the changes taking place in the corporate bond public market in Poland does not seem to be devoid of defects. Most corporate bonds are issues ranging from a few to several tens of millions PLN. A relatively small percentage of issues are comparable to the size of the share issue. The highest issues are also the domain of the banking sector, and then the energy sector, construction and development sector and telecommunications. Furthermore, issues of high value are the domain of large, well-known enterprises*. In addition, the vast majority of issuers do not use the services of credit rating agencies because this is an additional cost. Finally, the secondary market of corporate bonds is a market with negligible liquidity, and the maturities range only from few to several years and rarely exceed a period of 10 years. Moreover (especially in 2014 alone with 5 notices of bankruptcy and 16 issuers failed to meet maturity payments to bondholders), issuers are failing to meet the issuance conditions which is causing unfavorable environment for further development of corporate bond public market in Poland (see: Rozwój ... 2014, p. 260).

All factors mentioned above reflect a small share of corporate bonds in acquiring capital in Poland. Against the funds from the public issue of shares and long-term bank loans, the role of the public issue of corporate bonds seems to be negligible. Even if the value of the issue in recent years showed rapid growth, still for many companies the main source of capital in the form of external financing is bank loan. The reasons behind that little use of corporate bonds as a source of capital might be relatively high cost of raising capital on the stock market - 5% of the value of the issue (see: Antkiewicz 2011, pp. 142-143), which can be a disincentive for companies wanting to place an issue on the stock market. P. Niedziółka indicates also the dispersion of the Polish economy, which is dominated by small and medium-sized enterprises (consequently the amount of capital they want to obtain is too low to achieve the ranks of the stock market issuance), little interest on the part of investors to take on the risk of the issuers, relatively high requirements for admittance and information, costly rating institutions and the instability of the demand for the new bond issues (see: Niedziółka 2005, p. 297).

* In 2012 the biggest issuers: Bank Gospodarstwa Krajowego, PGNiG, PKO BP, Energa, PKN Orlen - all issues over 1 bln PLN. In 2013 in the biggest issues were involved PGE, ING Bank Śląski, GNB Auto and Ciech. In turn, the biggest issues (each 500 mln PLN) of 2014 were attributed to 2 banks: mBank and Bank Zachodni WBK.

3. Long-term credit for firms and raising capital through the issuance of corporate bonds

Market of long-term loans granted by banks is main competitor of other forms of raising capital (mainly the issue of shares and bonds). However, this market also complements and extends the area of possible ways of getting needed capital within the financial market.

The market of bank loans to the private sector is of paramount importance in Germany, Great Britain, France, Ireland and Greece, where as the Poland is an outsider in the analyzed group of countries with the lowest level of bank credit/GDP ratio. The level of 50% was just exceeded in 2011. In these countries (except Germany) in 2013 the ratio significantly exceeded the level of 100% of GDP as the table 3 shows.. The greatest significance bank credit has in the economies of Ireland (168.06% in 2013.) and Great Britain (157.96% in 2013.). The dynamics of changes of "bank loans to the private sector / GDP" ratio in the analyzed period indicates that the largest increase in this ratio occurred in the Greek (81.19 pp.) and Irish economy (81.97 pp.). The value of ratio in the Great Britain and France increased during the analyzed period by respectively 48,53 pp. and 33 pp. In contrast, in German economy value of the ratio has decreased by 18,75 pp. At the same time it is worth noting the growing importance of bank loans to the private sector in the initial period of the financial crisis (since 2008). This can be seen on the example of the Great Britain and Ireland, where the value of the market has exceeded 2 times the GDP peaking in Ireland in 2009. However after 2009 significant drop in ratio can be noted in each country except Poland and Greece. The largest decline in the size of loans in the 2008-2013 period falls on Great Britain - 29.19 pp. and Ireland - 42,33 pp. Significant rise of 30,52pp. reported the Greek economy.

Table 3. Bank credit for private sector/GDP in % in constant prices in the period 1999 – 2013.

Year	German y	Great Britain	France	Ireland	Greece	Poland
1999	115,55	109,42	bd.	86,09	36,36	22,94
2000	116,33	114,34	81,29	94,07	42,21	24,95
2001	117,40	123,39	85,07	98,99	49,76	26,5
2002	117,17	127,24	85,82	100,58	56,47	26,98
2003	116,26	130,04	86,23	104,72	59,34	27,17
2004	113,64	136,23	88,15	116,06	64,61	26,97

2005	111,83	143,17	90,24	136,24	73,20	27,74
2006	108,72	151,06	93,66	158,74	79,16	30,13
2007	104,56	164,09	99,33	178,30	86,04	34,66
2008	106,46	187,15	106,76	210,39	94,04	43,23
2009	113,03	202,20	111,38	227,53	95,73	47,39
2010	107,41	190,24	111,53	215,88	108,31	48,75
2011	103,37	179,87	113,33	194,32	123,84	51,4
2012	101,47	168,22	115,23	183,12	125,74	50,11
2013	96,81	157,96	114,30	168,06	124,56	N/A

Source: [Authors own study based on the same source as the Table 1.](#)

The value of the long-term loans to companies in the analyzed period was shaped in different ways. Clearly, the visible divide has been marked between countries where the corporate loans were used to a greater extent in the financial supply of companies and countries in which this type of financing method was used on a smaller scale. Germany and France are the countries where the value of corporate loans at the end of each year was clearly higher than in other countries, with an exception of Great Britain. Conclusion can be drawn, based on data series in table 4, that long-term credit has been an important source of financial supply in analyzed countries and played a greater role than raising funds from the stock market in the form of a bond issue.

Table 4. The value of long-term credit (above 1 year) to enterprises In bln USD In the period of 1999-2013. The end of the year values.

Year	German y	Great Britain	France	Ireland	Greece	Poland
1999	812,35	384,75	485,21	N/A	N/A	34,28
2000	804,21	337,61	451,99	N/A	N/A	36,33
2001	847,72	369,27	472,01	108,91	27,37	41,27

2002	955,35	411,29	507,53	99,20	32,27	48,25
2003	1 130,18	454,02	570,28	127,67	44,76	56,56
2004	1 201,93	541,87	651,15	140,27	55,69	55,69
2005	1 223,37	674,61	689,61	244,54	64,87	66,31
2006	1 291,63	748,55	772,10	336,77	72,17	87,71
2007	1 448,87	710,68	958,89	409,20	88,04	120,83
2008	1 647,19	774,40	1 154,63	505,44	106,64	199,62
2009	1 629,63	698,70	1 109,24	503,71	120,74	156,67
2010	1 594,67	826,39	1 071,67	514,89	130,87	160,96
2011	1 719,25	880,42	1 174,09	531,27	135,56	191,87
2012	1 615,30	943,21	1 076,49	469,39	113,98	175,84
2013	N/A	934,16	N/A	N/A	108,63	N/A

Source: <http://ec.europa.eu/eurostat/web/main/home>., access date: 13.12.2015r.

The value of long-term loans granted in 2012 in all of the analyzed countries amounts to 4.4 trillion USD. In 1999 the value of loans in the analyzed group was 1.6 trillion USD which is an increase of 154% and translates into an average annual growth of 190 billion USD.

On the other hand, taking into account the rate of change in the value of loans granted by banks in respective countries in the period 1999-2012, in all of the analyzed economies, the value of loans granted to companies has clearly increased. In Ireland, the value of loans increased by 331%, in Greece by 316%, in the Great Britain by 145%, 122% in France and in Germany the increase was 99%. However, in the analyzed period, the value of loans to businesses has experienced also smaller or bigger falls. Those decreases in value of long-term bank credit can be linked to 2008 and onwards. It caused the lending from financial institutions to be subjected to large fluctuations. It was primarily the result of economic situation in the world at that time - financial crisis, debt crisis, tightening prudential norms, the shortage of liquidity in the banking sector.

Conclusions

The raising of capital from the stock market by the companies in the analyzed countries in the given period was influenced by number of factors. It seems that at the forefront lies the state of the stock market situation in different countries and the importance of bank credit to businesses. Periods of good stock market situation in 1999-2000, 2003-20007 and 2013-2014 have contributed to a significant increase in the number and value of new issues on the stock markets. The period 1999-2000, prior to the crisis caused by the market revision of the internet companies (so called dot-coms in the US market, with particular emphasis on the NASDAQ) was represented by a large number of stock exchange issuances of both stocks and bonds.

In the Anglo-Saxon financial system (market-oriented) stock exchange plays a greater role as a source of raising capital than in the German financial system (bank-oriented). However, the importance of stock exchange in raising capital varies significantly depending on the country as the analysis of the sources and scale of capital gain for companies in the Great Britain and Ireland shows. It should also be noted that in Great Britain in the period 1999-2013 corporate bond issuances played increasingly important role. The analysis of statistical data concerning France allows to draw the conclusion that after the establishment of the common market Euronext issuance of corporate bonds played important role in raising capital for the companies, and the development of this market segment was larger than in the Great Britain and Germany.

In the countries of continental Europe with bank-oriented financial system (including Poland), a process of raising capital was dominated by bank loans rather than the issuance of shares and bonds. In addition, it should be emphasized that the stock market issue of corporate bonds in Poland is of little importance to businesses, despite the creation and launch of trading platform dedicated primarily to bonds and other debt instruments issued by firms. This is due, among others, to the fact that an important alternative to a regulated market bond issuance in Poland is the bank credit and the OTC market of corporate bonds ran by banks. In addition, the stock exchange corporate bond market in Poland is still a young market with limited liquidity and significant risks for investors. This results in that Poland has one of the lowest rates of raising capital from the stock exchange by issuance of corporate bonds.

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HOW CAN WE SOLVE THE YOUTH UNEMPLOYMENT DILEMMA?

“Soon, we will not speak for lost jobs but for a lost generation”

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Abstract

Today the world is facing major labor market challenges. More than 61 million jobs have been lost since the outset of the recent financial crisis, leaving 200 million individuals without a job. Roughly 40% of these unemployed are young people below the age of 25. The **“Fourth Industrial Revolution”** seems to cause disproportional stress on both the labor market and the education system. It brings with it changes in the way we learn, live, work and think. As a consequence the education system and the labor market need to be adapted. Various changes are necessary to happen:

- Educators need to realign the curriculum of their institutions
- Employers need to make sure that they provide jobs that are suitable for young people
- Employers need to better understand the types of skills they are looking for
- Schools and universities must change their strategies
- The education system and labor policy need to be disrupted

Crisis has hit Greece hard, but none harder than its young people. With nearly 50% unemployed, some of them are living in limbo waiting for life to restart and others moving abroad to find out a job. This current brain drain of young and capable university graduates, estimated between 170,000 and 200,000 people, will be disastrous for the desired recovery of the Greek economy. The unemployment in Greece is not due exclusively to crisis or to defects of the labor market and the education system. It is a rather complicated problem connected with the labor market candidates, their personality, skills and deficiencies.

JEL classification code: J64

Keywords: youth unemployment, emigration, economic crisis

Introduction

According to professor Klaus Schwab (2016), founder and executive chairman of the world economic forum: “previous industrial revolutions liberated humankind from animal power, made mass production possible and brought digital capabilities to billions of people. The **Fourth Industrial Revolution** is, however, fundamentally different. It is characterized by a range of new technologies (artificial intelligence, robotics, autonomous vehicles, 3D printing, nanotechnology, biotechnology, energy storage, quantum computing) that are fusing the physical, digital and biological worlds, impacting all disciplines, economies and industries and even challenging ideas about what it means to be human”. This revolution seems to cause disproportional stress on both the labor market and the education system. It brings with it changes in the way we learn, live, work and think. As a consequence the education system and the labor market need to be adapted.

More than 61 million jobs have been lost since the outset of the recent financial crisis in 2008, leaving 200 million individuals without a job. Roughly 40% of these unemployed are young people below the age of 25.

Youth unemployment rates are much higher than unemployment rates for all ages.

Table 1: Youth-to-adult unemployment ratio (selected European countries)

youth ue = 4xadult ue	youth ue = 3xadult ue	youth ue = 2xadult ue
Norway	Finland	Switzerland
UK	Belgium	Austria
Sweden	France	Germany
Italy	Poland	Denmark
	Hungary	Slovenia
	Slovak Rep.	Ireland
	Portugal	Spain
	Estonia	Greece
		Germany

Source: Vogel P., Generation Jobless, Palgrave McMillan, UK, 2015

Table 1 shows the youth-to-adult unemployment ratio in a number of European countries. There are three groups of countries. The first group includes countries with quadruple youth unemployment rate compared to the adult unemployment rate.

The second group, includes countries having youth unemployment rate three times higher than adult unemployment rate. The third group, includes countries like Greece, with youth unemployment rate double than the adult unemployment rate.

It is estimated that 500 million new jobs will be created by the year 2020 in order to provide work for the unemployed. Creating more jobs will not automatically solve the youth unemployment problem. World employers complain that young entrants to the work market are not equipped with the skills and capabilities needed by them. This shows that there is a gap between the job needs of business and the skills and capabilities young people bring with them moving from the education system to the labor market. As a consequence the education system and the labor market need to be adapted. A number of changes need to happen:

- educators need to realign the curriculum of their institutions to ensure that students are better prepared for work
- employers need to make sure that they provide jobs that are suitable for young people
- employers must play a role in training young people collaborating with universities on curricula development.
- employers need to better understand the types of skills they are looking for tomorrow
- the education system and labor policy need to be re-examined to make them more reactive to the changing market realities

If we want to solve **the youth unemployment dilemma**, we need to close the gap between the skills that young people bring with them leaving the educational system and the skills that the job market requires.

Economic Crisis in Greece and the Brain Drain

Crisis has hit Greece hard, but none harder than its young people. With nearly 50% unemployed, some of them are living in limbo waiting for life to restart and others are moving abroad hopping to find a job.

According to the Bank of Greece, 427,000 Greek people have been moved abroad from 2008 until today, looking for jobs. Those people have common characteristics such as high education and professional experience, contribute 12.9 billion euros annually to the host countries' GDP (mainly Germany and Britain) and 9.1 billion euros in tax revenue (Endeavor Greece). One fourth of the post-2010 emigrants are postgraduate degrees holders or are graduates of medical and polytechnic schools (Labrianidis & Pratsinakis, 2016). This emigration of qualified people deprives our country of individuals with skills for whom the Greek state has spent around 8 billion euros to educate them. This brain drain of young qualified people will be proved disastrous for the desired recovery of the Greek economy. To bring-back positive rates of growth, apart from a stable tax-system, efficient public administration, well operating institutions, such as education and justice, we also need valuable human capital. This loss of brains may be converted to an advantage if all these emigrants persuade to contribute with consulting, technical and entrepreneurial cooperation as well as with capitals, to the Greek society and economy (Labrianidis, 2016). To tackle the youth unemployment problem we should create new jobs. According to the rather optimistic findings of a survey conducted by Endeavor Greece (2015), an international non-profit entrepreneurship support organization, existing and new companies in Greece can create 1 billion new jobs within seven years. There is a minority of 3,000 high-growth existing companies that have the fundamentals to rapidly scale-up and create jobs. Collectively, they can create up to 200,000 new jobs most of them for youth. Another 800,000 jobs need to be created by 10,000 new highgrowth companies.

The unemployment in Greece is not due exclusively to economic crisis. It is a rather complicated problem connected with the labor market candidates, their personality, skills and deficiencies. According to the survey "Recruitment Confidence Index" conducted every six months by the ALBA Graduate Business School, 64.2% of the Greek companies face difficulties to find out young talented employees to take up open vacancies. To bridge the gap between the job needs of businesses and the knowledge and skills young entrants to the job market are equipped, some measures are necessary to be taken:

- Work placement at home or abroad facilitates students' transition into the work place and increases their possibilities to find out a permanent job
- Participation of employers in the university councils' can help in curricula development
- Initiatives aiming to inform young graduates about recent tendencies and opportunities in the labor market such as the “panorama of entrepreneurship and carrier development”, organized by professor Ladopoulos
- In-curricula entrepreneurship courses and entrepreneurship degrees in the Higher Education Institutions
- Career Centers that can provide information services and career guidance to students and alumni
- Radical changes to the system of entrance to the higher education institutions, which is centrally coordinated by the Greek Ministry of Education and Religious Affairs. Admission should be the result of candidates' personal preference what to study and not the random outcome of the Pan-Hellenic Examinations system. Today only 17% of the candidates are accepted to the department of their first choice.

Young Greek entrepreneurs, have excellent ability to start and develop successful businesses, not only in Greece but also abroad. Measures such as tax and social contributions reductions for start ups, initiatives, like JEREMIE, for the creation of knowledge based businesses and programmes providing support to new entrepreneurs to accelerate the development of their business in the first 12 months of operation, such as the successful Genesis Enterprise Programme implemented in Ireland, will help to keep our young scientists and professionals at home.

Conclusions

The “Fourth Industrial Revolution” seems to cause disproportional stress on the labor market and the education system. It is necessary to tackle the current youth unemployment crisis, close the gap between these two systems and help young people to join successfully the world of work.

In Greece, the last few years the youth unemployment crisis is even more serious. Hundred thousands young qualified graduates have emigrated looking for a job. To keep them at home, we need to create new jobs, to give them incentives to become entrepreneurs as well as to bridge the gap between the job needs of businesses and the knowledge and skills young entrants to the job market are equipped.

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Ανάλυση των Χρηματοοικονομικών Καταστάσεων του Κλάδου των Οικοδομικών Χρωμάτων τη Δεκαετία 2005 – 2014 και η Επίδραση της Οικονομικής Κρίσης

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Περίληψη

Η παρούσα εργασία έχει ως αντικείμενο την ανάλυση των χρηματοοικονομικών καταστάσεων του κλάδου των οικοδομικών χρωμάτων στην Ελλάδα και την επίδραση της οικονομικής κρίσης σε αυτόν. Αρχικά επιχειρείται μία σύντομη αναφορά στην ιστορική αναδρομή του κλάδου και στη διαχρονική εξέλιξή του. Στη συνέχεια με τη χρήση των κατάλληλων αριθμοδεικτών αναλύονται οι χρηματοοικονομικές καταστάσεις του κλάδου (ο οποίος αποτελείται από δεκαεπτά εταιρείες), για τη χρονική περίοδο 2005-2014. Διερευνώντας την επίδραση της οικονομικής κρίσης στον κλάδο των οικοδομικών χρωμάτων και σύμφωνα με την διαχρονική, διεπιχειρησιακή και κλαδική σύγκριση, προκύπτει ότι ο κλάδος έχει υποστεί πολύ μεγάλη καθίζηση καθώς ο κύκλος εργασιών έχει μειωθεί σχεδόν στο ήμισυ, σε σχέση με τον αντίστοιχο κύκλο προ οικονομικής κρίσης. Όμως, παρά τις δυσκολίες που αντιμετώπισε και εξακολουθεί να αντιμετωπίζει ο κλάδος, δείχνει σημάδια σταθεροποίησης και σταδιακής βελτίωσης.

Λέξεις κλειδιά: ανάλυση χρηματοοικονομικών καταστάσεων, αριθμοδείκτης,

κλάδος οικοδομικών χρωμάτων, οικονομική κρίση **JEL**

Classification: B26, G29, G30

Εισαγωγή

Η παρούσα εργασία έχει ως σκοπό να αναλύσει και να ερμηνεύσει τις χρηματοοικονομικές καταστάσεις του κλάδου των οικοδομικών χρωμάτων κατά τη δεκαετία 2005-2014 με την κατάλληλη χρήση αριθμοδεικτών, καθώς και να μελετήσει την επίδραση της οικονομικής κρίσης σε αυτόν.

Ο κλάδος των χρωμάτων χωρίζεται σε τρεις κατηγορίες και η ταξινόμηση γίνεται ανάλογα με την αγορά στην οποία απευθύνονται οι εταιρείες. Πιο συγκεκριμένα, στην πρώτη κατηγορία ανήκουν οι εταιρείες οικοδομικών χρωμάτων και βερνικιών, στη δεύτερη οι εταιρείες βιομηχανικών και ναυτιλιακών χρωμάτων, και στην τρίτη κατηγορία ανήκουν οι εμπορικές εταιρείες που ασχολούνται με το χονδρικό και το λιανικό εμπόριο των χρωμάτων.

Επίσης, οι δεκαεπτά εταιρείες που αποτελούν τον κλάδο των οικοδομικών χρωμάτων της παρούσας εργασίας επιλέχθηκαν σύμφωνα με τους παρακάτω περιορισμούς: α) όλες οι χρηματοοικονομικές καταστάσεις να έχουν δημοσιευτεί μέχρι τις 29-02-2016, β) οι χρηματοοικονομικές καταστάσεις να μη συντάσσονται σύμφωνα με τα Διεθνή Λογιστικά Πρότυπα, γ) οι χρηματοοικονομικές καταστάσεις να μην αφορούν ενοποιημένα μεγέθη ομίλων, αλλά μεμονωμένων εταιρειών, δ) το 51% του κύκλου

εργασιών να προέρχεται αποκλειστικά από οικοδομικά χρώματα, και ε) οι πωλήσεις να είναι μεγαλύτερες από 1.000.000€ καθ' όλη την εξεταζόμενη περίοδο.

Τα στοιχεία, στα οποία βασίστηκε η εκπόνηση της εργασίας, αντλήθηκαν από δημοσιευμένες χρηματοοικονομικές καταστάσεις που αναφέρονται στη δεκαετία 2005-2014 και προέρχονται, τόσο από την ιστοσελίδα της Ελληνικής Βιομηχανίας, όσο και από την ιστοσελίδα του Εθνικού Τυπογραφείου.

Η εξεταζόμενη περίοδος (2005-2014) θεωρείται ιδιαίτερα κρίσιμη, καθώς περιλαμβάνει έτη, τόσο πριν από την οικονομική κρίση, όσο και κατά τη διάρκεια αυτής. Αξίζει να σημειωθεί ότι κατά την εξεταζόμενη δεκαετία, ο κλάδος των οικοδομικών χρωμάτων πέτυχε το μεγαλύτερο ύψος πωλήσεων, ενώ σε ελάχιστα χρόνια, και λόγω της οικονομικής κρίσης, απώλεσε περίπου το 50%.

Τα τελευταία χρόνια, η οικονομική πορεία του κλάδου έχει επηρεαστεί από τη μειωμένη οικοδομική δραστηριότητα, τη διακοπή παροχής στεγαστικών δανείων και την ανασφάλεια που επικρατεί στην ελληνική αγορά, εξαιτίας της οικονομικής κρίσης που ταλανίζει τη χώρα μας.

Ακόμη, επιχειρείται να γίνει μία διαχρονική, διεπιχειρησιακή και κλαδική σύγκριση των εταιρειών που ανήκουν στον κλάδο των οικοδομικών χρωμάτων, ώστε να εξαχθούν χρήσιμα συμπεράσματα, όπως επίσης, να προταθούν βελτιωτικές προτάσεις και να προβλεφθεί η άμεση μελλοντική πορεία του κλάδου.

Συνεπώς, και σύμφωνα με τα παραπάνω, στόχος της παρούσας εργασίας είναι η αποτύπωση μιας ολοκληρωμένης και τεκμηριωμένης εικόνας για την χρηματοοικονομική κατάσταση του κλάδου των οικοδομικών χρωμάτων για την χρονική περίοδο 2005-2014.

Βιβλιογραφική επισκόπηση

Ο John Bellamy Foster (2009) προσδιόρισε σε μια μελέτη που έγινε σε 315 εταιρείες ότι οι μεταβολές στα κέρδη μιας εταιρείας επηρεάζονται, κατά μέσο όρο, κατά 36% από παράγοντες του ίδιου του κλάδου όπου δραστηριοποιείται η εταιρεία, και κατά 17% από παράγοντες που αφορούν το σύνολο της οικονομίας.

Σύμφωνα με τη μελέτη της Sheila Senathirajah (2010), η αγορά των χρωμάτων στην Ασία, και ιδιαίτερα στην Κίνα και στην Ινδονησία σημείωσε ανάπτυξη 20%, η οποία οφείλεται στην ραγδαία οικονομική ανάπτυξη της περιοχής. Το 2008, η αγορά χρωμάτων σημείωσε τζίρο 40,1 δισεκατομμύρια δολάρια με όγκο παραγωγής 13,6 εκατομμύρια τόνους ή 11 δισεκατομμύρια λίτρα χρώματος, δηλαδή το 30%-35% της παγκόσμιας βιομηχανίας χρωμάτων.

Ωστόσο, οι επιπτώσεις της παγκόσμιας οικονομικής κρίσης, αρχίζουν να διαφαίνονται στο δεύτερο εξάμηνο του 2008, συνεχίζοντας και στο πρώτο του 2009. Μόνο στα τέλη του 2009, οι βιομηχανικές εταιρείες χρωμάτων άρχισαν να βλέπουν ανάκαμψη, ενώ εκτιμάται ότι συνολικά το 2009, η αγορά κατέγραψε οριακή μόνο αύξηση.

Σε μία μελέτη της Hellastat (2009) για την εγχώρια αγορά χρωμάτων και βερνικιών διαπιστώνεται ότι η συγκεκριμένη αγορά εξαρτάται άμεσα από τις συνθήκες που επικρατούν στην οικοδομική και κατασκευαστική δραστηριότητα. Όμως, επηρεάζεται και από άλλους παράγοντες, όπως η πρόθεση των νοικοκυριών για ανακαίνιση των κατοικιών τους και οι προοπτικές των κλάδων στους οποίους απευθύνεται.

Ο Μάκης Προβατάς, διευθύνων σύμβουλος της Vivenchrom, παραχωρώντας συνέντευξη στην εφημερίδα Ημερησία (2014) και στο δημοσιογράφο Γιώργο Μανέττα δήλωσε ότι η επανεκκίνηση των δημοσίων έργων, καθώς και κάθε δραστηριότητα που έχει άμεση σχέση με τον κλάδο της οικοδομικής δραστηριότητας, είναι μία θετική εξέλιξη για την αγορά, ιδιαίτερα αυτή τη χρονική περίοδο, λέγοντας παράλληλα, ότι για να κινηθεί ολόκληρη η οικονομία δεν αρκεί μόνο αυτό, αλλά δεν παύει όμως να είναι ένα πρώτο θετικό βήμα.

Σύμφωνα με την κα Λέττα Καλαμαρά (2015), δημοσιογράφο της εφημερίδας Ναυτεμπορικής, η αγορά των οικοδομικών χρωμάτων εμφανίζει ενδείξεις σταθεροποίησης το 2013, ύστερα από πέντε χρόνια ύφεσης της οικοδόμησης ακινήτων, που είχε ως αποτέλεσμα την κάμψη των πωλήσεων οικοδομικών χρωμάτων. Την άποψη αυτή τη στηρίζει στη μελέτη που εκπονήθηκε από τον Αλέξη Νικολαΐδη Economic Research & Sectoral Studies Analyst της Infobank Hellastat για τον εγχώριο κλάδο της παραγωγής και εισαγωγής χρωμάτων.

Επιπλέον, σύμφωνα με τη μελέτη, η σταθεροποίηση στον κλάδο οφείλεται στην επιβράδυνση της εγχώριας κατανάλωσης, ενώ οι πωλήσεις κινήθηκαν στα ίδια επίπεδα του προηγούμενου έτους. Ακόμη, η ομαλοποίηση αυτή συνοδεύτηκε από ήπια άνοδο της παραγωγικής δραστηριότητας, καθώς σύμφωνα με την ΕΛΣΤΑΤ, σημειώθηκε αύξηση 2,6% μετά την πτωτική πορεία της προηγούμενης τετραετίας, κυρίως λόγω της ενίσχυσης των εξαγωγών.

Ο Χρυσόστομος Κάτσης, διευθύνων σύμβουλος της Infobank Hellastat, αναφέρει στην εφημερίδα Το Βήμα (2015) ότι η βελτίωση των μακροοικονομικών συνθηκών θα ομαλοποιήσει την κατανάλωση χρωμάτων, εφόσον συνοδευτεί από πολιτική σταθερότητα στο άμεσο μέλλον. Όμως, ως απαραίτητη προϋπόθεση θέτει την ανάκαμψη της οικοδομικής δραστηριότητας, η οποία για να επέλθει, απαιτεί την επανεκκίνηση των δημοσίων έργων σε διαχρονική, και όχι προσωρινή βάση.

Άρθρο της εφημερίδας Καθημερινής (2016) αναφέρει ότι η οικονομική κρίση και τα μέτρα δημοσιονομικής εξυγίανσης οδήγησαν στη συνεχή πτώση της οικοδόμησης ακινήτων, η οποία συνεχίστηκε και το 2014, παρά την ομαλοποίηση των μακροοικονομικών συνθηκών και την ήπια άνοδο του ΑΕΠ, με συνέπεια την κάμψη της ζήτησης οικοδομικών χρωμάτων. Σύμφωνα με κλαδική μελέτη της IBHS, οι πολεοδομίες της χώρας εξέδωσαν μόλις 13.383 άδειες (-18,3% από το 2013), αριθμός που υπολείπεται σε σχέση με το επίπεδο του 2005 κατά 86%.

Η ελληνική αγορά χρωμάτων, σύμφωνα με τα στοιχεία της Eurostat, το 2014 είχε συνολικό τζίρο 252 εκατομμύρια ευρώ, εκ των οποίων τη μερίδα του λέοντος είχαν τα οικοδομικά χρώματα με 190 εκατομμύρια ευρώ και ποσοστό 75,4%.

Κλείνοντας, ο αρθρογράφος του capital.gr, Δημήτρης Δελεβέγκου (2016), αναφέρει ότι η επανεκκίνηση των έργων στους οδικούς άξονες, που αναμένεται να αποπερατωθούν μέχρι την άνοιξη του 2017, καθιστά τα στελέχη των μεγαλύτερων κατασκευαστικών ομίλων περισσότερο αισιόδοξα, διότι η συμφωνία κράτους, εταιρειών και τραπεζών για την συνέχιση των οδικών έργων αναμένεται να οδηγήσει οριστικά στην αποπεράτωση του μεγαλύτερου τμήματος των νέων εθνικών οδών, δημιουργώντας προσδοκίες για μία συνολική επανεκκίνηση της οικοδομικής και κατασκευαστικής δραστηριότητας.

Ιστορική αναδρομή του κλάδου των χρωμάτων

Η ιστορία της ελληνικής βιομηχανίας χρωμάτων ξεκινά το δεύτερο τέταρτο του 19^{ου} αιώνα και η εξέλιξή της βασίστηκε στην ανάπτυξη της εργαστηριακής χημείας και στην εμφάνιση νέων υλικών, ενώ εξαρτήθηκε από τις υπάρχουσες βιομηχανίες άλλων κλάδων.

Τα πρώτα χρωματουργεία εμφανίστηκαν στη Βρετανία στα μέσα του 18^{ου} αιώνα και στη συνέχεια εξαπλώθηκαν στην υπόλοιπη Ευρώπη. Όμως, στην Ελλάδα έκαναν την εμφάνισή τους πολύ αργότερα, επειδή η χώρα μας παρακολουθούσε τις εξελίξεις με αρκετή καθυστέρηση και ο κλάδος των χρωμάτων δε θα μπορούσε να ευδοκιμήσει ως συμπληρωματικός της σιδηρουργίας.

Η βιομηχανία χρωμάτων συνδέθηκε πολύ έντονα με τον κλάδο της ναυτιλίας, διότι η ναυτιλία αναπτύχθηκε νωρίς και συνέβαλε στην ελληνική ανάπτυξη. Τα πρώτα βήματα στη βιομηχανία χρωμάτων έγιναν στη νησιωτική Ελλάδα (Σύρος), διότι εκεί υπήρχαν ναυπηγεία. Η κρίση στη ναυτιλία, αλλά και οι νέες εδαφικές προσαρτήσεις από τους Βαλκανικούς πολέμους έδωσαν το χαριστικό χτύπημα στη βιομηχανία της Σύρου, και έτσι, τη σκυτάλη της ανάπτυξης παρέλαβε ο Πειραιάς, που ήδη από τα τέλη της δεκαετίας του 1880 λειτουργούσαν αρκετά χρωματοποιεία.

Κατά το τέλος του 19^{ου} αιώνα, ο Τρικούπης συνέβαλε στην ανάπτυξη της βιομηχανίας χρωμάτων έμμεσα, διότι είχε καλέσει ξένες αποστολές για την κατασκευή δημοσίων έργων, με αποτέλεσμα η οικοδομική δραστηριότητα και η παραγωγή χρωμάτων να έχουν μία παράλληλη και αλληλένδετη πορεία.

Μετά τον Α' Παγκόσμιο Πόλεμο, υπήρχαν ευνοϊκές οικονομικές και κοινωνικές συνθήκες και έτσι, αυξήθηκαν οι βιομηχανικές μονάδες σε όλους τους κλάδους. Επίσης, από το 1920 και μετά, αρχίζει η ταχύτερη και πυκνή δόμηση σε νέες γειτονιές και η τάση αυτή ενισχύθηκε από την εσωτερική μετανάστευση. Παράλληλα έγινε πιο εντατική και η χρήση χρωμάτων.

Κατά τη διάρκεια του Μεσοπολέμου, η οικοδομική δραστηριότητα συνεχίστηκε έντονα, λόγω των προσφυγικών ροών που έπρεπε να στεγαστούν. Στην αύξηση της ανοικοδόμησης συνέβαλε και η Εθνική Τράπεζα Ελλάδος, η οποία αναγκάστηκε να γίνει πιο ελαστική ως προς τη χορήγηση δανείων. Έτσι, συνεχίστηκε η ανοικοδόμηση και στην υπόλοιπη ύπαιθρο, με αποτέλεσμα την ταχύτερη ανάπτυξη της χρωματοβιομηχανίας.

Επιπλέον, την περίοδο 1924-1939 υπήρχε υπερδεκαπλασιασμός στη συνολική παραγωγή χρωμάτων που από 200 τόνους το 1924, έφτασε τους 2.300 τόνους το 1939. Σε αυτό συνέβαλε και το πρώτο κύμα ιδρύσεων βιομηχανιών βερνικιών και χρωμάτων που παρατηρήθηκε την ίδια περίοδο. Ο κυρίαρχος χώρος προσανατολισμού αυτών των νέων βιομηχανιών ήταν τα οικοδομικά χρώματα.

Μέχρι την έναρξη του Β' Παγκοσμίου Πολέμου, η ελληνική βιομηχανία χρωμάτων είχε σημειώσει μία αξιόλογη πορεία, όσον αφορά την παραγωγική δυναμικότητα, ενώ μετά τη λήξη του πολέμου απομακρύνθηκε από τη ναυτιλία και συνδέθηκε, αλλά και εξαρτήθηκε στενά από την οικοδομική δραστηριότητα πραγματοποιώντας μία αλματώδη πρόοδο. Έτσι, η περίοδος 1945-1979 χαρακτηρίστηκε ως η χρυσή εποχή του κλάδου, με τους δείκτες της βιομηχανικής παραγωγής να αυξάνονται αισθητά. Σε αυτό συνέβαλε η μεγάλη εγχώρια ζήτηση για χρώματα, καθώς και η υποτίμηση της δραχμής (1953) διότι υπήρξε μείωση του δασμολογικού προστατευτισμού. Όμως, η ελληνική βιομηχανία χρωμάτων δεν εξελίχθηκε σε εξαγωγική βιομηχανία εξαιτίας της έλλειψης ποικιλίας προϊόντων, της γεωγραφικής θέσης της χώρας, της γραφειοκρατίας, κλπ..

Το 1957 η παραγωγή χρωμάτων έφτανε τους 3.427 τόνους ετησίως, ενώ τρία χρόνια αργότερα έφτανε τους 5.800 τόνους. Την περίοδο 1966-1968 δημιουργήθηκαν 20 βιοτεχνίες, 2 μικρές βιομηχανίες και πολλές πρόχειρες βιοτεχνίες με στόχο την παραγωγή πλαστικών χρωμάτων και βερνικιών. Ο κλάδος των χρωμάτων για να αντιμετωπίσει τον ανταγωνισμό προχώρησε σε συσπειρωτικές ενέργειες, αρχικά με μία άτυπη ένωση, αλλά λόγω του ξένου ανταγωνισμού που εντάθηκε, η άτυπη ένωση δεν ήταν επαρκής. Οπότε δημιουργήθηκε η Πανελλήνια Ένωση Βιομηχανιών Χρωμάτων και Βερνικιών. Ο δυναμισμός του κλάδου εκφράστηκε και με τη παραγωγή νέων προϊόντων και την επέκταση της γεωγραφικής εμβέλειας των συστημάτων διανομής.

Παρατηρώντας τις παραπάνω εξελίξεις, η γενική πολιτική των κυβερνήσεων τη δεκαετία 1960-1970 ήταν να αυξηθούν οι εξαγωγές, υιοθετώντας μία σειρά θεσμικών μέτρων. Λίγα χρόνια αργότερα, στην απογραφή της ΕΣΥΕ (1973), καταγράφηκαν 79 παραγωγικές μονάδες, από τις οποίες οι 25 ήταν μεγάλες βιομηχανίες, ενώ οι υπόλοιπες ήταν βιοτεχνίες. Επίσης, υπήρχε και ένας μεγάλος αριθμός από οικοτεχνίες. Ενώ, στα τέλη της δεκαετίας του 1970, ο κλάδος αποτελούνταν από 138 μονάδες παραγωγής.

Τα πρώτα αποτελέσματα από τη λήψη των θεσμικών μέτρων για την αύξηση των εξαγωγών εμφανίζονται από τη δεκαετία του 1980 και έπειτα, όταν οι επιχειρήσεις του κλάδου των χρωμάτων επιχειρούν να μεταβληθούν και σε εξαγωγικές βιομηχανίες. Το 1989 η παραγωγή χρωμάτων και βερνικιών υπερπενταπλασιάστηκε φθάνοντας τους 67.000 τόνους, από 12.000 τόνους που ήταν το 1965.

Σημαντικό ρόλο στην εξέλιξη της βιομηχανίας χρωμάτων διαδραμάτισε η τεχνολογία. Ήδη, οι ελληνικές επιχειρήσεις από την αρχή της λειτουργίας τους προώθησαν την εγκατάσταση χημικών εργαστηρίων και τη χρήση μηχανημάτων, ελληνικής και ξένης προέλευσης.

Επιπλέον, η πορεία του κλάδου των χρωμάτων στιγματίστηκε από κάποιες εταιρείες που διαδραμάτισαν καταλυτικό ρόλο στη δημιουργία και στην εξέλιξη και του κλάδου. Η πρώτη εταιρεία ήταν η ΙΡΙΣ (1924), η οποία έθεσε τα πρώτα ισχυρά θεμέλια στον κλάδο των χρωμάτων και κυκλοφόρησε, λίγο πριν το Β' Παγκόσμιο Πόλεμο, το πρώτο ελληνικό χρώμα. Η δεύτερη εταιρεία ήταν η BIBEXΡΩΜ (1932), η οποία κατέκτησε την ηγετική θέση στον κλάδο εφαρμόζοντας διαφορετικές μεθόδους και πολιτικές. Ακόμη, και η εταιρεία ΧΡΩΤΕΧ (1945) διαδραμάτισε σημαντικό ρόλο διότι από την αρχή προσέφερε εξαιρετικής ποιότητας προϊόντα, ενώ το 1962 διέθετε ειδικά κονδύλια για τη διαφήμιση των προϊόντων της, τα οποία αυξάνονταν ραγδαία (87.250 δρχ. το 1962 και 2.367.894 δρχ. το 1965).

Όσον αφορά τις εταιρείες που εντάσσονται στον κλάδο των οικοδομικών χρωμάτων της παρούσας εργασίας είναι δεκαεπτά και ακολουθούν με αλφαβητική σειρά, όσον αφορά το brand name της κάθε εταιρείας: Arvanco, Benjamin Moore, Berling, Carmyco, Durostic, Er-Lac, Maxi Color, Neotex, Sirca, Superlux, Sylak, Vechro, Vernicol, Vernilak, Vitex, Vivechrom και Χρωτέχ.

Υπολογισμός και ανάλυση αριθμοδεικτών

Η γενική ρευστότητα του κλάδου των οικοδομικών χρωμάτων κινείται σε σταθερά επίπεδα τη δεκαετία 2005-2014 (πίνακας 1), χωρίς να σημειώνει ιδιαίτερες διακυμάνσεις, με το μέσο όρο να είναι στο 1,69. Όμως, εξετάζοντας πιο προσεκτικά το δείκτη, παρατηρούμε ότι η διάρθρωση του ενεργητικού δεν είναι πολύ καλή διότι τα αποθέματα αποτελούν το 26,72%, οι απαιτήσεις το 67,74%, τα χρεόγραφα το 0,01% και τα διαθέσιμα το 5,53%.

Παρόλο την οικονομική κρίση, η ρευστότητα του κλάδου βελτιώνεται ποιοτικά τα τρία τελευταία χρόνια, διότι αυξάνονται τα διαθέσιμα κατά 97,22% (από 687.851,07€ σε 1.356.607,69€), μειώνονται οι απαιτήσεις κατά 24,64% (από 7.568.614,64€ σε

5.703.808,57€) και τα αποθέματα κατά 22,78% (από 3.364.068,13 σε 2.597.682,31€).

Συμπεραίνουμε γενικά ότι η ρευστότητα του κλάδου παρόλο που είναι υψηλή, δεν είναι ποιοτικά καλή, με αποτέλεσμα εάν δεν αλλάξει στρατηγική να αντιμετωπίσει προβλήματα ρευστότητας στο μέλλον και οι εταιρείες του κλάδου να μην είναι ικανές να καλύψουν τις βραχυπρόθεσμες υποχρεώσεις τους σε περίπτωση άμεσης εξόφλησης και να εξαρτώνται από τις μελλοντικές πωλήσεις. Επίσης, σε αυτό συμβάλλει και ο υψηλός μέσος όρος παραμονής αποθεμάτων.

Πίνακας 1: Αριθμοδείκτης γενικής ρευστότητας (σε φορές).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	1,52	1,64	1,67	1,64	1,73	1,78	1,70	1,84	1,71	1,63

Ο κλάδος των οικοδομικών χρωμάτων διατηρεί σχετικά σταθερή τη μέση περίοδο είσπραξης απαιτήσεων (πίνακας 2), τόσο πριν από την οικονομική κρίση, όσο και κατά τη διάρκεια αυτής, με μέσο όρο 195 μέρες. Αυτό σημαίνει ότι χορηγεί μεγάλες πιστώσεις στους πελάτες, διευκολύνοντάς τους από την άμεση καταβολή των οφειλών τους λόγω της οικονομικής κρίσης. Όμως, αυτή η πολιτική είναι αρκετά επικίνδυνη γιατί μπορεί μεν να προσελκύει νέους πελάτες και να διευκολύνει τους υπάρχοντες, αλλά ταυτόχρονα οι απαιτήσεις μπορεί να καταστούν ανεπίδεκτες είσπραξης. Έτσι, το 2014 παρατηρούμε μείωση του δείκτη κατά 13,33% σε σχέση με το 2011, λόγω αυστηρής πολιτικής που αρχίζει να εφαρμόζει ο κλάδος για την έγκαιρη είσπραξη των απαιτήσεων.

Πίνακας 2: Μέση περίοδος είσπραξης απαιτήσεων (σε μέρες).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	189	191	180	193	203	204	210	207	189	182

Αξίζει να σημειωθεί ότι από τη μελέτη των χρηματοοικονομικών καταστάσεων παρατηρήθηκε μία αισθητή μείωση του ύψος των απαιτήσεων το 2009, εξαιτίας της μεγάλης μείωσης των πωλήσεων. Συγκεκριμένα, οι απαιτήσεις του κλάδου μειώθηκαν κατά 13,56% (από 10.323.234,31€ σε 8.923.061,12€), ενώ οι πωλήσεις για το ίδιο έτος μειώθηκαν κατά 17,68% (από 19.499.539,90€ σε 16.052.365,49€), σε σχέση με το 2008.

Όσον αφορά τη μέση περίοδο εξόφλησης των βραχυπρόθεσμων υποχρεώσεων του κλάδου (πίνακας 3), παρατηρείται μία διαχρονική σταθερότητα με το μέσο όρο να βρίσκεται στις 273 μέρες. Ακόμη, λόγω των αυξημένων πωλήσεων και κατ' επέκταση της αυξημένης κερδοφορίας την τριετία 2005-2007, ο κλάδος εξοφλεί τις υποχρεώσεις του πιο γρήγορα (μείωση του αριθμοδείκτη κατά 8,99%), χωρίς αυτό να συνεπάγεται μειωμένη ρευστότητα. Αντίθετα, από το 2012 και μετά, η αύξηση του δείκτη κατά 8,15%, θεωρείται δυσμενής εξέλιξη διότι ο κλάδος δυσκολεύεται να αποπληρώσει τις υποχρεώσεις του εξαιτίας της μείωσης της ρευστότητας. Γενικά όμως, οι εταιρείες του κλάδου έχουν μεριμνήσει να αποπληρώνουν τις υποχρεώσεις τους σε μεγαλύτερο χρονικό διάστημα από αυτό που μεσολαβεί από την είσπραξη των απαιτήσεων.

Πίνακας 3: Μέση περίοδος εξόφλησης βραχυπρόθεσμων υποχρεώσεων (σε μέρες).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	278	262	253	269	270	262	279	270	291	292

Ο μέσος όρος παραμονής αποθεμάτων του κλάδου των οικοδομικών χρωμάτων είναι αρκετά υψηλός (πίνακας 4), με αποτέλεσμα τα αποθέματα να ανανεώνονται κατά μέσο όρο κάθε 123 μέρες. Επίσης, ο κλάδος δε διαχειρίζεται ορθολογικά τα αποθέματά του, σε σχέση πάντα με το ύψος των πωλήσεων, εμφανίζοντας ποιοτικά κακή ρευστότητα, αλλά και υπεραποθεματοποίηση, η οποία ενδεχομένως να εγκυμονεί μεγάλους κινδύνους για την οικονομική πορεία του, και κατά συνέπεια να υπάρχει κίνδυνος οικονομικής απαξίωσης των αποθεμάτων λόγω αλλοίωσής τους ή περιορισμένης ζήτησής τους.

Εξαιτίας της οικονομικής κρίσης που ταλανίζει την ελληνική οικονομία, και ιδιαίτερα τον εξεταζόμενο κλάδο λόγω της ύφεσης της οικοδομικής δραστηριότητας, ο κλάδος με το πέρασ των ετών διατηρεί χαμηλότερο ύψος αποθεμάτων, με εξαίρεση το 2011, όπου παρουσιάζει μία αύξηση στο ύψος των αποθεμάτων κατά 3,16% (από 3.261.091,43€ σε 3.364.068,13€).

Πίνακας 4: Μέσος όρος παραμονής αποθεμάτων (σε μέρες).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	112	107	116	115	124	125	138	137	132	125

Σημαντικό ρόλο στο ύψος των αποθεμάτων διαδραματίζουν οι πωλήσεις του κλάδου, οι οποίες κορυφώνονται το 2008, ενώ από το 2009 που αρχίζει ουσιαστικά η οικονομική κρίση, μειώνονται δραματικά. Συγκεκριμένα, το 2012 ο κλάδος έχει απωλέσει περίπου το 50% του κύκλου εργασιών του σε σχέση με την περίοδο προ κρίσης. Συνεπώς, λόγω των χαμηλότερων πωλήσεων διατηρεί και χαμηλότερο ύψος αποθεμάτων.

Ο αριθμοδείκτης ταχύτητας κυκλοφορίας παγίων του κλάδου των οικοδομικών χρωμάτων τη δεκαετία 2005-2014 είναι κατά μέσο όρο 2,31. Όπως φαίνεται στον πίνακα 5, ο κλάδος σημειώνει πτωτική πορεία διότι δε χρησιμοποιεί εντατικά τα πάγια στοιχεία. Ακόμη, τη περίοδο πριν την οικονομική κρίση, και συγκεκριμένα τα έτη 2005-2008, τα πάγια στοιχεία του κλάδου αυξάνονται κατά 35,07% (από 5.544.922,09€ σε 7.489.535,20€), με παράλληλη αύξηση των μακροπρόθεσμων υποχρεώσεων κατά 144,08% (από 480.463,19€ σε 3.613.583,37€). Αυτό σημαίνει ότι ο κλάδος επένδυσε σε πάγια στοιχεία του ενεργητικού, όμως η συνεχής πτωτική πορεία του δείκτη δείχνει ανεπαρκή χρησιμοποίηση των παγίων στοιχείων σε σχέση με τις πωλήσεις, οδηγώντας παράλληλα σε μια μειούμενη αποδοτικότητα των κεφαλαίων.

Πίνακας 5: Αριθμοδείκτης ταχύτητας κυκλοφορίας παγίων (σε φορές).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	2,92	2,94	2,91	2,60	2,30	2,16	2,01	1,73	1,79	1,75

Επιπρόσθετα, η κυκλοφοριακή ταχύτητα των ιδίων κεφαλαίων του κλάδου σημειώνει μία πτωτική πορεία από το 2008 μέχρι και το 2012, ενώ τα επόμενα δύο χρόνια ο δείκτης αυξάνεται οριακά (πίνακας 6). Ο μέσος όρος του αριθμοδείκτη την εξεταζόμενη περίοδο είναι 1,68. Επίσης, το έτος 2012 μπορούμε να το χαρακτηρίσουμε ως το έτος με τη βαθύτερη ύφεση, τόσο στον κλάδο των οικοδομικών χρωμάτων, όσο και στην ελληνική οικονομία γενικότερα εξαιτίας της οικονομικής κρίσης, ο δείκτης σημειώνει τη χαμηλότερη τιμή (1,24) λόγω της μείωσης του κύκλου εργασιών κατά 18,30% (από 13.132.631,76€ σε 10.729.067,41€). Συνεπώς, η πτωτική πορεία του δείκτη δείχνει μη εντατική χρησιμοποίηση των ιδίων κεφαλαίων και κατ' επέκταση μειούμενη αποδοτικότητα ιδίων κεφαλαίων. Όμως, μπορούμε να θεωρήσουμε ευνοϊκή εξέλιξη τη μείωση του αριθμοδείκτη από πλευράς ασφάλειας, διότι η μείωση της κυκλοφοριακής ταχύτητας ιδίων κεφαλαίων συνοδεύεται από μείωση του υψηλού μακροπρόθεσμου δανεισμού κατά 35,11% (από 3.613.583,37€ σε 344.738,44€).

Πίνακας 6: Αριθμοδείκτης ταχύτητας κυκλοφορίας ιδίων κεφαλαίων (σε φορές).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	1,98	2,00	2,12	2,02	1,74	1,58	1,45	1,24	1,34	1,35

Ο αριθμοδείκτης μικτού κέρδους του κλάδου των οικοδομικών χρωμάτων σημειώνει μία σταθερή πορεία, με εξαίρεση την τριετία 2010-2012 που σημειώνει πτώση, εξαιτίας της οικονομικής κρίσης (πίνακας 7). Το ποσοστό μικτού κέρδους μειώνεται κατά 18,24%, σε σχέση με το 2009, ενώ ο μέσος όρος την εξεταζόμενη δεκαετία είναι 35,58% και θεωρείται πολύ ικανοποιητικός. Ακόμη, η πτωτική πορεία του αριθμοδείκτη δείχνει ένα μειούμενο ποσοστό μικτού κέρδους, το οποίο συνοδεύεται από μειούμενες πωλήσεις, με αποτέλεσμα ο κλάδος να σημειώνει ολοένα και χαμηλότερα μικτά κέρδη. Όμως, τόσο το 2013, όσο και το 2014 ο δείκτης μικτού κέρδους ανακάμπτει, λόγω της αύξησης του κύκλου εργασιών.

Πίνακας 7: Αριθμοδείκτης μικτού κέρδους (%).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	36,42	37,99	37,99	37,83	37,93	35,66	32,01	31,01	34,32	34,60

Σε αντίθεση με τη σταθερότητα του παραπάνω δείκτη, ο αριθμοδείκτης καθαρού κέρδους σημειώνει καθοδική πορεία από το 2009 και έπειτα, με εξαίρεση το 2013, με το μέσο όρο να κυμαίνεται στο 9,80% την περίοδο 2005-2014 (πίνακας 8). Η πτωτική πορεία του αριθμοδείκτη δείχνει ένα μειούμενο ποσοστό καθαρού κέρδους, το οποίο συνοδεύεται από μειούμενες πωλήσεις, και οδηγεί σε χαμηλότερα καθαρά κέρδη, ενώ το 2014 σημειώνει οριακά καθαρά κέρδη. Η ανάκαμψη του κλάδου το 2013 προέρχεται από την αύξηση των πωλήσεων κατά 1,67% (από 10.729.067,41€ σε 10.908.522,93€), με παράλληλη μείωση του κόστους πωληθέντων κατά 3,21% (από 7.402.220,54 σε 7.164.833,56€) και των χρεωστικών τόκων κατά 6,30% (από 396.756,89€ σε 371.771,50€).

Πίνακας 8: Αριθμοδείκτης καθαρού κέρδους (%).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	13,60	15,34	16,46	14,13	15,15	9,87	6,99	2,30	3,51	0,67

Τόσο ο δείκτης αποδοτικότητας ιδίων κεφαλαίων, όσο και ο δείκτης αποδοτικότητας συνολικών κεφαλαίων του κλάδου των οικοδομικών χρωμάτων αυξάνεται την περίοδο 2005-2007, λόγω της αύξησης των πωλήσεων κατά 18,60% (από 16.207.111,95€ σε 19.221.674,82€), και κατά συνέπεια των καθαρών κερδών κατά 43,46% (από 2.204.958,55 σε 3.163.154,43€). Όμως, τα επόμενα χρόνια ο δείκτης σημειώνει πτωτική πορεία, με το μέσο όρο για τον πρώτο αριθμοδείκτη να κυμαίνεται στο 18,17% (πίνακας 9), ενώ για το δεύτερο στο 17,16% (πίνακας 10) κατά τη διάρκεια της εξεταζόμενης δεκαετίας. Η μείωση των αριθμοδεικτών οφείλεται αφενός στη δραματική μείωση του κύκλου εργασιών εξαιτίας της οικονομικής κρίσης, και αφετέρου στην αδυναμία διαχείρισης της υπερεπένδυσης κεφαλαίων σε πάγια στοιχεία και αποθέματα, και δείχνει ένα μειούμενο ποσοστό απόδοσης των ιδίων και των συνολικών κεφαλαίων σε καθαρά κέρδη.

Αξίζει να σημειωθεί ότι κατά τη διάρκεια των ετών 2005-2014, τα ίδια κεφάλαια των εταιρειών του κλάδου παραμένουν σχετικά σταθερά και χωρίς ιδιαίτερες διακυμάνσεις στο ύψος τους.

Πίνακας 9: Αριθμοδείκτης αποδοτικότητας ιδίων κεφαλαίων (%).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	26,90	30,74	34,85	28,53	26,39	15,63	10,15	2,86	4,69	0,91

Πίνακας 10: Αριθμοδείκτης αποδοτικότητας συνολικών κεφαλαίων (%).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	25,47	27,28	28,74	24,55	22,54	14,22	11,43	5,85	7,25	4,25

Όσον αφορά την κεφαλαιακή διάρθρωση και βιωσιμότητα του κλάδου των οικοδομικών χρωμάτων, ο δείκτης ίδια προς συνολικά κεφάλαια κινείται αρκετά υψηλά με το μέσο όρο να κυμαίνεται στο 77,87% (πίνακας 11). Η πορεία του δείκτη διαχρονικά είναι σχετικά σταθερή, εκτός από τα έτη 2006-2008 που σημειώνει κάμψη λόγω αύξησης των μακροπρόθεσμων υποχρεώσεων κατά 144,08% (από 1.480.463,19€ σε 3.613.583,37€) σε διάστημα μόλις τριών ετών. Ακόμη, ο κλάδος διαθέτει πολύ καλή δανειοληπτική ικανότητα διότι ο αριθμοδείκτης είναι αρκετά υψηλός, με αποτέλεσμα να εξασφαλίζεται η ομαλή εξόφληση των μακροπρόθεσμων υποχρεώσεών του. Επίσης, η ανοδική πορεία του δείκτη διαχρονικά παρέχει την ένδειξη ότι η μακροχρόνια οικονομική κατάσταση του βελτιώνεται συνεχώς.

Πίνακας 11: Αριθμοδείκτης ίδια προς συνολικά κεφάλαια (%).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	84,70	79,17	73,94	72,78	74,40	76,31	79,40	78,47	78,41	81,16

Σε αντίθεση, ο δείκτης ξένα προς συνολικά κεφάλαια του κλάδου των οικοδομικών χρωμάτων κινείται σε χαμηλά επίπεδα με το μέσο όρο να είναι στο 22,13% (πίνακας 12). Η πορεία του δείκτη διαχρονικά είναι σχετικά σταθερή, ενώ με το πέρας των ετών μειώνεται, εκτός από τα έτη 2006-2008 που αυξάνεται, λόγω αύξησης των μακροπρόθεσμων υποχρεώσεων. Επίσης, μία μικρή αύξηση σημειώνεται και το 2012 διότι οι μακροπρόθεσμες υποχρεώσεις αυξάνονται κατά 0,98% (από 2.344.738,44€ σε 2.367.787,89€). Γενικά, λόγω της χαμηλής τιμής του δείκτη, ο κλάδος διαθέτει αρκετά καλή δανειοληπτική ικανότητα, εξασφαλίζοντας έτσι την ομαλή αποπληρωμή των μακροπρόθεσμων υποχρεώσεών του.

Αξιίζει να σημειωθεί ότι το 2005, το 53% των εταιρειών είχε μακροπρόθεσμες υποχρεώσεις, ενώ δέκα χρόνια αργότερα είχε μόνο το 35%, και από αυτές μόνο μία εταιρεία είχε πολύ μεγάλο μακροπρόθεσμο δανεισμό.

Πίνακας 12: Αριθμοδείκτης ξένα προς συνολικά κεφάλαια (%).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	15,30	20,83	26,06	27,22	25,60	23,69	20,60	21,53	21,59	18,84

Ο δείκτης δανειακής επιβάρυνσης του κλάδου των οικοδομικών χρωμάτων κινείται σε πολύ χαμηλά επίπεδα όλη την εξεταζόμενη περίοδο με το μέσο όρο να είναι 0,29 (πίνακας 13). Επίσης, παρατηρούμε ότι ο δείκτης από το 2005 έως και το 2007 αυξάνεται κατά 94,44% (από 0,18 σε 0,35), λόγω της αύξησης των μακροπρόθεσμων υποχρεώσεων κατά 116,05% (από 1.480.463,19€ σε 3.198.504,88€) την ίδια περίοδο. Από το 2008 και μετά, όμως, ο δείκτης του κλάδου ακολουθεί μία πτωτική πορεία εξαιτίας της μείωσης των μακροπρόθεσμων υποχρεώσεων, με παράλληλη μείωση της επενδυτικής δραστηριότητας λόγω της οικονομικής κρίσης.

Επίσης, επειδή ο αριθμοδείκτης είναι κάτω από τη μονάδα αυτό δείχνει, αφενός ότι τα ίδια κεφάλαια του κλάδου είναι μεγαλύτερα από τα ξένα, και αφετέρου ότι ο κλάδος έχει την ικανότητα να δανείζεται μακροπρόθεσμα με ευνοϊκούς όρους αποπληρωμής, θεωρητικά βέβαια, διότι τα πιστωτικά ιδρύματα σήμερα δανείζουν με πολύ αυστηρά κριτήρια και προϋποθέσεις.

Πίνακας 13: Αριθμοδείκτης δανειακής επιβάρυνσης (σε φορές).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	0,18	0,26	0,35	0,37	0,34	0,31	0,26	0,27	0,28	0,23

Ο δείκτης ίδια κεφάλαια προς πάγια του κλάδου των οικοδομικών χρωμάτων κατά τη διάρκεια της εξεταζόμενης δεκαετίας 2005-2014 είναι σχετικά σταθερός και χωρίς έντονες μεταβολές με το μέσο όρο να κυμαίνεται στο 1,37 (πίνακας 14). Η μικρή πτώση του 2008 οφείλεται στην αύξηση των παγίων κατά 35,07% (από 5.544.922,09€ το 2005 σε 7.489.535,20€ το 2008), με παράλληλη αύξηση

των μακροπρόθεσμων υποχρεώσεων κατά 144,08% (από 1.480.463,19€ σε 3.613.583,37€). Γενικά, επειδή ο δείκτης είναι μεγαλύτερος από τη μονάδα, σημαίνει ότι τα ίδια κεφάλαια του κλάδου υπερκαλύπτουν το πάγιο ενεργητικό του, ενώ ένα μέρος τους χρησιμοποιείται και για τη χρηματοδότηση του κυκλοφορούντος ενεργητικού.

Πίνακας 14: Αριθμοδείκτης ίδια κεφάλαια προς πάγια (σε φορές).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	1,48	1,47	1,37	1,29	1,32	1,36	1,39	1,39	1,34	1,29

Ο αριθμοδείκτης κάλυψης τόκων του κλάδου των οικοδομικών χρωμάτων, επηρεασμένος από την οικονομική κρίση που πλήττει την Ελλάδα, ακολουθεί μία πτωτική πορεία με το μέσο όρο να είναι στο 4,47 (πίνακας 15). Ο δείκτης σημειώνει αισθητή πτώση κατά 33,24% (από 7,46 σε 4,98) το 2008, και κατά 59,76% (από 1,64 σε 0,66) το 2012, κυρίως λόγω της μείωσης του κύκλου εργασιών και κατ' επέκταση των καθαρών κερδών προ φόρων και τόκων. Η διαχρονική μείωση του δείκτη κάλυψης τόκων δείχνει μείωση της ικανότητας του κλάδου να ανταποκρίνεται στις υποχρεώσεις του από τόκους, όμως, οι χρεωστικοί τόκοι θα καταβάλλονται χωρίς δυσκολία ακόμη και εάν τα καθαρά κέρδη προ φόρων και τόκων μειωθούν μέχρι και 77,63% $[(4,47-1)/4,47 = 0,7763]$.

Πίνακας 15: Αριθμοδείκτης κάλυψης τόκων (σε φορές).

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ΚΛΑΔΟΣ	7,89	8,12	7,46	4,98	5,19	4,65	1,64	0,66	2,34	1,81

Συμπεράσματα και προτάσεις βελτίωσης

Όσον αφορά τη ρευστότητα του κλάδου των οικοδομικών χρωμάτων είναι ικανοποιητική, καθώς όλη την εξεταζόμενη περίοδο κινείται σε σταθερά επίπεδα, εξοφλώντας τις βραχυπρόθεσμες υποχρεώσεις χωρίς κάποιο πρόβλημα. Όμως, η διάρθρωση του κυκλοφορούντος ενεργητικού του κλάδου δεν είναι πολύ καλή διότι το ύψος των αποθεμάτων είναι αρκετά υψηλό, οπότε θα πρέπει ο κλάδος να αυξήσει τα ρευστά διαθέσιμά του και να μειώσει τα αποθέματά του εναρμονίζοντάς τα σύμφωνα με το ύψος των πωλήσεών του, ώστε να εξοικονομήσει δαπάνες αποθήκευσης και διαχείρισης αποθεμάτων, αλλά και να μειώσει τον κίνδυνο της οικονομικής απαξίωσης των αποθεμάτων, λόγω αλλοίωσής τους ή περιορισμένης ζήτησής τους.

Επιπλέον, ο κλάδος διατηρεί διαχρονικά μία χαλαρή πιστωτική πολιτική με στόχο να προσελκύσει όσο το δυνατόν νέους πελάτες, με αποτέλεσμα να εξοφλεί και τις βραχυπρόθεσμες υποχρεώσεις του σε μεγαλύτερο χρονικό διάστημα διότι πρώτα εισπράττει και μετά πληρώνει. Όμως, οι εταιρείες που απαρτίζουν τον κλάδο θα πρέπει να είναι αρκετά προσεκτικές ως προς τον κίνδυνο απώλειας ορισμένων απαιτήσεων, βελτιώνοντας παράλληλα τόσο τον χρόνο είσπραξης, χωρίς επιπτώσεις στο ύψος των πωλήσεων, όσο και τον χρόνο αποπληρωμής, πετυχαίνοντας μεγαλύτερες εκπτώσεις αγορών, με αποτέλεσμα να μειωθεί το κόστος πωληθέντων και να αυξηθούν τα καθαρά κέρδη.

Όσον αφορά το πάγιο ενεργητικό του κλάδου, όσο περνούν τα χρόνια δε χρησιμοποιεί εντατικά το πάγιο ενεργητικό του στην παραγωγική διαδικασία διότι και έχει προχωρήσει σε υπερεπένδυση κεφαλαίων σε πάγια στοιχεία, και ο κύκλος εργασιών είναι μειωμένος εξαιτίας της οικονομικής

κρίσης. Συνεπώς, θα πρέπει ο κλάδος είτε να προχωρήσει σε ρευστοποίηση ορισμένων παγίων, είτε να αυξήσει τις πωλήσεις του.

Επιπρόσθετα, ο κλάδος έχει ένα αρκετά ικανοποιητικό ποσοστό μικτού κέρδους, αποκομίζοντας παράλληλα και ένα εξίσου ικανοποιητικό ποσοστό καθαρού κέρδους, αν εξαιρέσουμε βέβαια την τελευταία τριετία. Ακόμη, η αποδοτικότητα των ιδίων και των συνολικών κεφαλαίων είναι συνεχώς μειούμενη εξαιτίας τη μείωσης των καθαρών κερδών, η οποία οφείλεται στη δραματική μείωση του κύκλου εργασιών λόγω της οικονομικής κρίσης που πλήττει την Ελλάδα.

Όσον αφορά τη διάρθρωση των κεφαλαίων, ο κλάδος των οικοδομικών χρωμάτων χρηματοδοτείται κυρίως από ίδια κεφάλαια και σε ένα μικρό ποσοστό από ξένα κεφάλαια, τα οποία μειώνονται κατά τη διάρκεια της εξεταζόμενης δεκαετίας. Επιπλέον, η δανειοληπτική ικανότητα του κλάδου είναι πολύ καλή και δεν αντιμετωπίζει κάποιο πρόβλημα στην αποπληρωμή ούτε των μακροπρόθεσμων υποχρεώσεων, αλλά ούτε και στην καταβολή των χρεωστικών τόκων.

Συμπερασματικά, ο κλάδος των οικοδομικών χρωμάτων διαγράφει μία πολύ καλή πορεία, παρά το γεγονός ότι ο κύκλος εργασιών μειώθηκε περίπου 50%, εξαιτίας της ύφεσης της οικοδομικής δραστηριότητας, η οποία είναι συνέπεια της οικονομικής κρίσης που ταλανίζει τη χώρα μας περίπου από το 2009 και έπειτα.

Πρόβλεψη για τη μελλοντική πορεία του κλάδου

Η μελλοντική πορεία του κλάδου των οικοδομικών χρωμάτων είναι δύσκολη να προβλεφθεί, καθώς η οικονομική αβεβαιότητα που συνεχίζει να επικρατεί στη χώρα μας και η οποία εντάθηκε ραγδαία το περσινό καλοκαίρι εξαιτίας των capitals controls, καθώς και η συνεχιζόμενη ύφεση στην οικοδομική δραστηριότητα, επηρεάζουν αρνητικά όλο τον κλάδο.

Σύμφωνα με την τάση των χρηματοοικονομικών καταστάσεων των εταιρειών του κλάδου τα τελευταία χρόνια, αλλά κυρίως σύμφωνα με τις οικονομικές συνθήκες που επικρατούν το τελευταίο χρονικό διάστημα, ο κλάδος των οικοδομικών χρωμάτων θα κινηθεί στα ίδια επίπεδα με το 2014, τόσο στο ύψος των πωλήσεων, όσο και στο ύψος του όγκου παραγωγής. Επίσης, θα υπάρξει μείωση των μακροπρόθεσμων υποχρεώσεων, όπως συμβαίνει τα τελευταία χρόνια, ενώ η ρευστότητα θα βελτιωθεί λόγω της αυστηρότερης πολιτικής είσπραξης απαιτήσεων που ακολουθεί ο κλάδος την τελευταία τριετία. Ακόμη, οι μεγαλύτερες εταιρείες του κλάδου από πλευράς πωλήσεων, πολύ πιθανόν να σημειώσουν αύξηση στις πωλήσεις τους, και κατά συνέπεια του όγκου παραγωγής τους.

Κλείνοντας, η παραπάνω πρόβλεψη αφορά, τόσο το 2015 για το οποίο δεν έχουν δημοσιευτεί ακόμη όλες οι χρηματοοικονομικές καταστάσεις, όσο και το 2016, και με την προϋπόθεση ότι οι οικονομικές συνθήκες που επικρατούν στην Ελλάδα δεν θα οξυνθούν, αλλά θα παραμείνουν τουλάχιστον σταθερές.

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Ασαφείς Χρονολογικές Σειρές Προβλέψεις Αφίξεων Τουριστών στην Κύπρο

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Περίληψη

Στην εργασία αυτή χρησιμοποιείται η ολοκληρωμένη μέθοδος προβλέψεων, με τη χρήση ασαφών χρονολογικών σειρών, του Liu¹⁰ για την κατασκευή ενός μοντέλου για τις αφίξεις τουριστών από τη Β. Αμερική στην Κύπρο. Τα μοντέλα των ασαφών χρονολογικών σειρών τα οποία, σε αντίθεση με τα κλασικά μοντέλα, δεν περιορίζονται από βασικές προϋποθέσεις που πρέπει να τηρούνται προκειμένου να χρησιμοποιηθούν και, επιπλέον, μπορούν να λειτουργήσουν με γλωσσικές μεταβλητές, γίνονται σε πολλές περιπτώσεις ελκυστικά, ιδιαίτερα όταν ο στόχος δεν είναι η ακρίβεια των προβλέψεων αλλά η λήψη αποφάσεων.

Λέξεις κλειδιά: Ασαφή σύνολα, Ασαφείς Χρονολογικές σειρές, Προβλέψεις

1. Εισαγωγή

Η θεωρία των ασαφών συνόλων προτάθηκε από τον Lofti A. Zadeh το 1965¹¹. Η βασική ιδέα είναι ότι τα ασαφή σύνολα είναι «κλάσεις αντικειμένων με ένα συνεχές διαβαθμίσεων συμμετοχής». Είναι δηλαδή σύνολα, των οποίων τα σύνορα δεν είναι επακριβώς καθορισμένα και τότε η συμμετοχή ενός στοιχείου σε αυτά δεν είναι ζήτημα κατάφασης ή άρνησης, αλλά μάλλον ζήτημα ενός βαθμού.

Τα ασαφή σύνολα, και η επακόλουθη ασαφής λογική, μπορούν να λειτουργήσουν σε περιβάλλον ασάφειας και αβεβαιότητας δίνοντάς μας αποτελέσματα που βρίσκονται πολύ κοντά στον ανθρώπινο τρόπο σκέψης και έκφρασης.¹² Επιπλέον, με την χρήση της Αρχής της Επέκτασης (Zadeh, 1965) οι έννοιες των κλασικών (μη ασαφών) μαθηματικών επεκτάθηκαν στις αντίστοιχες ασαφείς έννοιες και, ως συνέπεια, κατέστη δυνατή η παραγωγή νέων ποσοτικών μεθόδων οι οποίες εφαρμόζονται με επιτυχία σε πολλούς τομείς.

Οι ασαφείς χρονολογικές σειρές (Fuzzy Time Series – FTS) προτάθηκαν στις αρχές τις δεκαετίας του '90 από τους Song και Chissom^{13, 14}. Στόχος τους ήταν η ανάπτυξη μοντέλων για δυναμικές διαδικασίες και η χρήση τους για προβλέψεις, όταν τα ιστορικά δεδομένα είναι ή μπορούν να αποτυπωθούν ως γλωσσικές μεταβλητές.

Σε αντίθεση με τα αντίστοιχα στατιστικά μοντέλα, οι ασαφείς χρονολογικές σειρές δεν απαιτούν για τη χρήση τους συνθήκες, όπως η κανονικότητα ή η στατικότητα, μπορούν να λειτουργήσουν ακόμα και όταν δεν μας είναι γνωστά όλα τα δεδομένα, μας «απαλλάσσουν» από την αυστηρότητα και την περιπλοκότητα των στατιστικών μοντέλων και είναι ιδιαίτερα χρήσιμα, κυρίως όταν ο στόχος μας δεν είναι τόσο η ακρίβεια της πρόβλεψης αλλά η λήψη αποφάσεων βάσει καταστάσεων.

Στα χρόνια που ακολούθησαν πολλοί ερευνητές (Chen, 1996; Hwang et al., 1998; Lee & Chou, 2004; Tsaur, 2005, Singh, 2007a, Singh, 2007b) βελτίωσαν και συνεχίζουν να βελτιώνουν τα μοντέλα

¹⁰ Liu, H. T. (2009). An integrated fuzzy time series forecasting system. *Expert Systems with Applications*, 36, 10045 – 10053.

¹¹ Zadeh, L. A. (1965). Fuzzy Sets. *Information and Control*, 8, 338 – 353.

¹² Χρήστος Τζιμόπουλος, Βασίλης Παπαδόπουλος. *Ασαφής Λογική με εφαρμογές στην επιστήμη του μηχανικού*. εκδ. ΖΗΤΗ, Θεσσαλονίκη, 2013.

¹³ Song, Q. & Chissom, B. S. (1993a). “Fuzzy forecasting enrollments with fuzzy time series – Part I”. *Fuzzy Sets and Systems*, 54(1), 1 – 9.

¹⁴ Song, Q. & Chissom, B. S (1993b). “Fuzzy time series and its models”. *Fuzzy Sets and Systems*, 54(3), 269 - 277.

των ασαφών χρονολογικών σειρών, πετυχαίνοντας απλοποίηση των υπολογισμών και καλύτερα αποτελέσματα.

Ο Liu (2009) χρησιμοποιώντας τους τραπεζοειδείς ασαφείς αριθμούς, οι οποίοι είναι κατάλληλοι και για την απόδοση γλωσσικών μεταβλητών¹⁵, βελτίωσε προηγούμενες μεθόδους και ανέπτυξε ένα ολοκληρωμένο σύστημα πρόβλεψης ασαφών χρονολογικών σειρών το οποίο λαμβάνει υπόψη του την τάση και την εποχικότητα των χρονολογικών σειρών.

Στο Κεφάλαιο 2 παρουσιάζονται οι βασικοί ορισμοί και έννοιες των ασαφών χρονολογικών σειρών και μια συνοπτική παρουσίαση της μεθόδου του Liu.

Στο Κεφάλαιο 3 γίνεται η εφαρμογή της μεθόδου, για την πρόβλεψη αφίξεων τουριστών από την Β. Αμερική στην Κύπρο.

Στο Κεφάλαιο 4 παρουσιάζονται τα συμπεράσματα της παρούσας εργασίας.

2. Ασαφείς χρονολογικές σειρές και η μέθοδος του Liu

Οι βασικοί ορισμοί και τα πρώτα θεωρήματα των ασαφών χρονολογικών σειρών δόθηκαν από τους Song και Chissom (1993a, 1993b, 1994).

Ορισμός 1. Έστω $Y(t)(t=...,0,1,2,...)$ ένα υποσύνολο του \square^1 , που συνιστά το σύμπαν του λόγου στο οποίο ορίζονται τα ασαφή σύνολα $f_i(t)(i=1,2,...)$ και $F(t)$ είναι η συλλογή των $f_i(t)(i=1,2,...)$. Τότε η $F(t)$ ονομάζεται *ασαφής χρονολογική σειρά* στο $Y(t)(t=...,0,1,2,...)$.

Ορισμός 2. Εάν υπάρχει ασαφής σχέση $R(t-1, t)$, τέτοια ώστε $F(t)=F(t-1)\circ R(t-1, t)$, όπου \circ είναι ένας αριθμητικός τελεστής, τότε λέμε ότι η $F(t)$ προκαλείται μόνον από την $F(t-1)$, και θα συμβολίζεται από $F(t-1)\rightarrow F(t)$. Η ασαφής σχεσιακή εξίσωση $F(t)=F(t-1)\circ R(t-1, t)$ ονομάζεται *πρώτης τάξης μοντέλο* της $F(t)$.

Ορισμός 3. Έστω ότι η $F(t)$ προκαλείται μόνον από την $F(t-1)$ και ότι $F(t)=F(t-1)\circ R(t-1, t)$. Εάν, για κάθε t , η σχέση $R(t-1, t)$ είναι ανεξάρτητη από το t , δηλαδή εάν $R(t-1, t)=R(t-2, t-1)$ τότε η $F(t)$ ονομάζεται *χρονικά αμετάβλητη* ασαφής χρονολογική σειρά. Διαφορετικά, ονομάζεται *χρονικά μεταβαλλόμενη*.

Παρατηρήσεις

1) Στον παραπάνω ορισμό, η $F(t)$ μπορεί να θεωρηθεί ως μία γλωσσική μεταβλητή με τα ασαφή σύνολα $f_i(t)(i=1,2,...)$ να αποτελούν τις γλωσσικές τιμές της $F(t)$.

2) Καθώς, σε διαφορετικές χρονικές στιγμές, οι τιμές της $F(t)$ μπορεί να είναι διαφορετικές η $F(t)$ είναι μία συνάρτηση του χρόνου.

$..., F(1)=\{f_1(1), f_2(1), f_3(1)\}, F(2)=\{f_1(2), f_2(2)\}, ..., F(k)=\{f_1(k), f_2(k), f_3(k), f_4(k)\}, ...$

3) Ο παραπάνω ορισμός επιτρέπει το σύμπαν του λόγου να είναι διαφορετικά υποσύνολα του \square^1 σε διαφορετικές στιγμές, και αυτός είναι ο λόγος που χρησιμοποιούμε το συμβολισμό $Y(t)$.

Η βασική διαφορά ανάμεσα στις κλασικές και τις ασαφείς χρονολογικές σειρές είναι ότι στις κλασικές χρονολογικές σειρές οι παρατηρήσεις είναι πραγματικοί αριθμοί ενώ στις ασαφείς χρονολογικές σειρές είναι ασαφή σύνολα.

Θεώρημα. Έστω $F(t)$ μία ασαφής χρονολογική σειρά. Εάν για κάθε t , $F(t)=F(t-1)$ και η $F(t)$ αποτελείται από πεπερασμένο πλήθος στοιχείων, τότε η $F(t)$ είναι χρονικά αμετάβλητη.

¹⁵ Klir, G. J & Yuan, B. *Fuzzy Sets and Fuzzy Logic, Theory and Application*. Prentice Hall: Englewood Cliffs, New Jersey, 1995.

Παρατηρήσεις

1) Το παραπάνω θεώρημα, μας λέει ότι εάν τα ασαφή σύνολα $f_i(t) (i=1,2,...)$ που συγκροτούν τα σύνολα τιμών της γλωσσικής μεταβλητής $F(t)$ στις διάφορες χρονικές στιγμές είναι τα ίδια και στο πλήθος τους πεπερασμένα, τότε η ασαφής χρονολογική σειρά είναι χρονικά αμετάβλητη.

2) Σε κάθε χρονική στιγμή, το σύμπαν του λόγου είναι υποσύνολο του \square^1 . Και καθώς στην πράξη τις περισσότερες φορές αυτό είναι ένα κλειστό σύνολο, μπορούμε για όλες τις χρονικές στιγμές να έχουμε το ίδιο καθολικό σύνολο, αν λάβουμε ως τέτοιο το ευρύτερο από τα κλειστά σύνολα ή ακόμα και το ίδιο το \square^1 .

Επίσης, τις περισσότερες φορές οι τιμές μιας γλωσσικής μεταβλητής είναι πεπερασμένες. Για παράδειγμα, ας θεωρήσουμε τη γλωσσική μεταβλητή «θερμοκρασία». Τιμές που μπορεί να πάρει είναι «πολύ χαμηλή», «χαμηλή», για το μήνα Ιανουάριο, «χαμηλή», «σχετικά χαμηλή» για το μήνα Φεβρουάριο, «σχετικά χαμηλή», «μέτρια» για το μήνα Μάρτιο κ.ο.κ. Παρόλο που αυτή η χρονολογική σειρά φαίνεται να είναι χρονικά μεταβαλλόμενη, χωρίς βλάβη της γενικότητας, μπορούμε για όλους τους μήνες, δηλαδή για όλες τις χρονικές στιγμές t , να θεωρήσουμε ότι παίρνει τιμές από το ίδιο σύνολο, που δεν είναι άλλο από το «πολύ χαμηλή», «χαμηλή», «σχετικά χαμηλή», «μέτρια», «σχετικά υψηλή», «υψηλή», «πολύ υψηλή», και τότε θα χειριζόμαστε μία σειρά χρονολογικά αμετάβλητη.

3) Για τις χρονικά αμετάβλητες ασαφείς χρονολογικές σειρές οι Song και Gissom (1993b) απέδειξαν ότι είναι πολύ εύκολο και βολικό να υπολογίζουμε ένα πρώτης τάξης μοντέλο.

Ορισμός 4. Έστω $F(t-1) = \tilde{A}_i$ και $F(t) = \tilde{A}_j$. Τότε, μια ασαφής λογική σχέση μπορεί να οριστεί ως $\tilde{A}_i \rightarrow \tilde{A}_j$, όπου τα \tilde{A}_i και \tilde{A}_j καλούνται το αριστερό και το δεξί μέρος της ασαφούς λογικής σχέσης, αντίστοιχα. (Liu, 2009)

Η μέθοδος του Liu αποτελείται από τα παρακάτω βήματα¹⁶:

Βήμα 1: Έλεγχος για εποχικότητα και τάση - εξομάλυνση των δεδομένων: Τα δεδομένα ελέγχονται για εποχικότητα και ασαφή τάση, και εφόσον υπάρχουν γίνονται οι κατάλληλοι μετασχηματισμοί για την εξομάλυνση των δεδομένων.

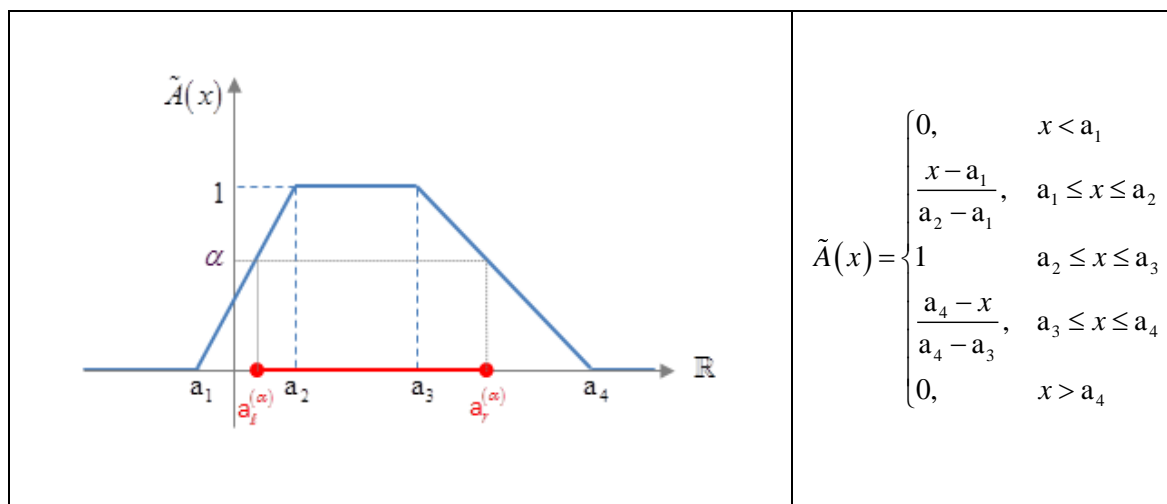
Βήμα 2: Προσδιορισμός του πλήθους και του μήκος των διαστημάτων: Λέγοντας διαστήματα εννοούμε τα ίσα διαστήματα στα οποία διαιρείται το εύρος των δεδομένων (σύμπαν του λόγου).

Βήμα 3: Προσδιορισμός των ασαφών αριθμών και παραγωγή των ασαφών λογικών σχέσεων και των ασαφών λογικών ομάδων: Καθένα από τα διαστήματα που υπολογίζονται στο Βήμα 2 αποτελεί τη μικρή βάση ενός ασαφούς τραπεζοειδούς αριθμού $\tilde{A}(a_1, a_2, a_3, a_4)$. Ακολουθεί η ασαφοποίηση των δεδομένων, δηλαδή βρίσκουμε τον ασαφή τραπεζοειδή αριθμό στον οποίο ανήκει το κάθε δεδομένο. Στη συνέχεια παράγονται οι ασαφείς λογικές σχέσεις, οι οποίες έχουν τη μορφή $\tilde{A}_j \rightarrow \tilde{A}_k$ υπό την έννοια ότι «εάν τη χρονική στιγμή $t-1$ έχω παρατήρηση στον ασαφή αριθμό \tilde{A}_j τότε την επόμενη χρονική στιγμή t έχω παρατήρηση στον ασαφή αριθμό \tilde{A}_k . Τέλος, οι ασαφείς λογικές σχέσεις εισέρχονται σε ασαφείς λογικές ομάδες που δημιουργούνται από τους ασαφείς αριθμούς. Μια ασαφής λογική ομάδα έχει τη μορφή $\tilde{A}_j \rightarrow \tilde{A}_{k_1}, \tilde{A}_j \rightarrow \tilde{A}_{k_2}, \dots, \tilde{A}_j \rightarrow \tilde{A}_{k_p}$

¹⁶ Εδώ δίνεται μία συνοπτική παρουσίαση της μεθόδου. Για μια λεπτομερή παρουσίαση βλ. Liu (2009)

Σχήμα 1

Ασαφής τραπεζοειδής αριθμός και η συνάρτηση συμμετοχής του



Βήμα 4: Παράγουμε τα εξαγόμενα των προβλέψεων και υπολογίζουμε τις τελικές προβλεπόμενες τιμές: Με τη χρήση 3 ευρετικών κανόνων υπολογίζονται οι προβλέψεις, οι οποίες είναι επίσης ασαφείς τραπεζοειδείς αριθμοί. Στην περίπτωση της εξομάλυνσης των στοιχείων οι προβλέψεις που παράγονται δεν λαμβάνουν υπόψη τους την εποχικότητα ή την τάση που υπήρχαν στα αρχικά δεδομένα, και, συνεπώς, για τα τελικά αποτελέσματα θα πρέπει να γίνουν οι κατάλληλες μετατροπές.

3. Προβλέψεις Αφίξεων Τουριστών Β. Αμερικής στην Κύπρο

Για την εφαρμογή της μεθόδου πρόβλεψης με τη χρήση ασαφών χρονολογικών σειρών, θα χρησιμοποιήσουμε τις μηνιαίες αφίξεις τουριστών από τη Βόρειο Αμερική στην Κύπρο των ετών 2012 – 2015.

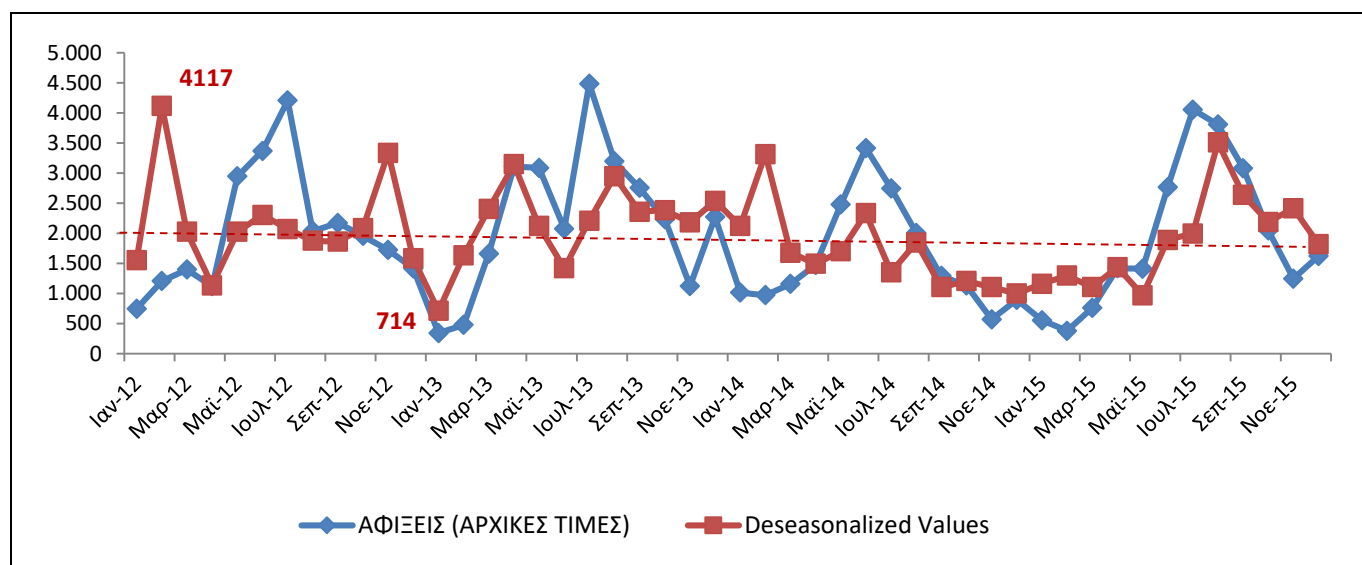
Βήμα 1: Έλεγχος για εποχικότητα και τάση - εξομάλυνση των δεδομένων

Το διάγραμμα των ιστορικών δεδομένων (Σχήμα 1) δείχνει ότι οι αφίξεις των τουριστών εμφανίζουν εποχικότητα, με την κορύφωση των αφίξεων να συμβαίνει κυρίως τον μήνα Ιούλιο (και σε μία περίπτωση τον Ιούνιο), κάτι που είναι απολύτως αναμενόμενο καθώς η τουριστική κίνηση να είναι αυξημένη κατά τους θερινούς μήνες.

Για την εξομάλυνση της χρονολογικής σειράς χρησιμοποιήθηκε η μέθοδος των κινητών μέσων (moving averages) το στατιστικό πακέτο SPSS.

Στο διάγραμμα παρατηρούμε ότι, μετά την αφαίρεση της εποχικότητας, η χρονική σειρά δεν εμφανίζει κάποια ιδιαίτερη τάση. Μπορούμε επομένως να προχωρήσουμε στο επόμενο βήμα.

Σχήμα 2
Αφίξεις Τουριστών από τη Βόρειο Αμερική στην Κύπρο



ΠΗΓΗ: Στατιστική Υπηρεσία της Κυπριακής Δημοκρατίας

Στον πίνακα 1, βλέπουμε τις αρχικές τιμές R_t , τις τιμές Dv_t μετά την αφαίρεση της εποχικότητας που είναι και οι τιμές που θα χρησιμοποιηθούν για την κατασκευή του μοντέλου καθώς δεν υπάρχει τάση και τους δείκτες εποχικότητας Si_t .

Η σχέση που συνδέει τις παραπάνω τιμές είναι $Dv_t = \frac{R_t}{Si_t}$

Πίνακας 1
Αρχικές τιμές – Τιμές μετά την αφαίρεση της εποχικότητας – Δείκτες εποχικότητας

Μήνας	t	Αφίξεις Αρχικές τιμές R_t	Τιμές μετά την αφαίρεση της εποχικότητας Dv_t	Δείκτες Si_t	Μήνας	t	Αφίξεις Αρχικές τιμές R_t	Τιμές μετά την αφαίρεση της εποχικότητας Dv_t	Δείκτες Si_t
Ιαν-12	1	746	1557	0,479	Ιαν-14	25	1017	2122	0,479
Φεβ-12	2	1208	4117	0,293	Φεβ-14	26	973	3316	0,293
Μαρ-12	3	1400	2028	0,690	Μαρ-14	27	1159	1679	0,690
Απρ-12	4	1123	1136	0,988	Απρ-14	28	1477	1494	0,988
Μαϊ-12	5	2947	2026	1,455	Μαϊ-14	29	2478	1703	1,455
Ιουν-12	6	3371	2305	1,463	Ιουν-14	30	3417	2336	1,463
Ιουλ-12	7	4207	2071	2,031	Ιουλ-14	31	2748	1353	2,031
Αυγ-12	8	2037	1878	1,084	Αυγ-14	32	2004	1848	1,084
Σεπ-12	9	2174	1862	1,168	Σεπ-14	33	1292	1107	1,168
Οκτ-12	10	1957	2088	0,937	Οκτ-14	34	1132	1208	0,937
Νοε-12	11	1724	3337	0,517	Νοε-14	35	571	1105	0,517
Δεκ-12	12	1417	1585	0,894	Δεκ-14	36	895	1001	0,894
Ιαν-13	13	342	714	0,479	Ιαν-15	37	557	1162	0,479
Φεβ-13	14	480	1636	0,293	Φεβ-15	38	381	1298	0,293
Μαρ-13	15	1661	2406	0,690	Μαρ-15	39	764	1106	0,690

Απρ-13	16	3112	3149	0,988	Απρ-15	40	1421	1438	0,988
Μαϊ-13	17	3089	2123	1,455	Μαϊ-15	41	1413	971	1,455
Ιουν-13	18	2078	1421	1,463	Ιουν-15	42	2766	1891	1,463
Ιουλ-13	19	4488	2210	2,031	Ιουλ-15	43	4057	1997	2,031
Αυγ-13	20	3198	2949	1,084	Αυγ-15	44	3808	3511	1,084
Σεπ-13	21	2755	2360	1,168	Σεπ-15	45	3082	2640	1,168
Οκτ-13	22	2237	2386	0,937	Οκτ-15	46	2051	2188	0,937
Νοε-13	23	1126	2180	0,517	Νοε-15	47	1248	2416	0,517
Δεκ-13	24	2270	2539	0,894	Δεκ-15	48	1626	1819	0,894

Βήμα 2: Προσδιορισμός του πλήθους και του μήκους των διαστημάτων

Βρίσκουμε τη μέγιστη $D_{\min} = 714$ και την ελάχιστη $D_{\max} = 4117$ των τιμών μετά την αφαίρεση της εποχικότητας. Επομένως, το σύμπαν του λόγου είναι $U = [714, 4117]$. Υπολογίζουμε το άθροισμα των απόλυτων πρώτων διαφορών $\sum |Dv_i - Dv_{i-1}| = 30.901$ και τον μέσο τους 657.48.

Για τον υπολογισμό του μήκους των διαστημάτων λαμβάνουμε το ήμισυ του μέσου, επομένως $657,48/2 = 328,74$ και με στρογγυλοποίηση στην πλησιέστερη εκατοντάδα προκύπτει $l = 300$.

Βήμα 3: Προσδιορισμός των ασαφών αριθμών και παραγωγή των ασαφών λογικών σχέσεων και των ασαφών λογικών ομάδων.

Για τον υπολογισμό του μήκους των διαστημάτων επιλέγουμε δύο κατάλληλους αριθμούς, τέτοιους ώστε η μέγιστη και η ελάχιστη τιμή να στρογγυλοποιηθούν στην πλησιέστερη εκατοντάδα. Οι αριθμοί είναι $D_1 = -14$ και $D_2 = 183$. Τότε το πλήθος των διαστημάτων, και συνεπώς των ασαφών αριθμών, υπολογίζεται ως:

$$m = \frac{(D_{\max} + D_2) - (D_{\min} + D_1)}{l} = \frac{4300 - 700}{300} = 12$$

Έχουμε επομένως τα εξής διαστήματα: $u_1 = [700, 1000]$, ..., $u_{12} = [4000, 4300]$

Οι αντίστοιχοι τραπεζοειδείς ασαφείς αριθμοί είναι:

$$\tilde{A}_1 = (700, 700, 1000, 1300), \tilde{A}_2 = (700, 1000, 1300, 1600), \dots, \tilde{A}_{12} = (3700, 4000, 4300, 4300)$$

Ασαφοποιούμε τώρα τα δεδομένα Dv_i , ως εξής: Αν $Dv_i \in u_j$ τότε $Dv_i \in \tilde{A}_j$. Στον Πίνακα 2, βλέπουμε τα αποτελέσματα της ασαφοποίησης των δεδομένων.

Πίνακας 2
Ασαφοποίηση των δεδομένων

Μήνας	t	Dv_i	Ασαφοποίηση δεδομένων	Μήνας	t	Dv_i	Ασαφοποίηση δεδομένων
Ιαν-12	1	1557	A3	Ιαν-14	25	2122	A5
Φεβ-12	2	4117	A12	Φεβ-14	26	3316	A9
Μαρ-12	3	2028	A5	Μαρ-14	27	1679	A4
Απρ-12	4	1136	A2	Απρ-14	28	1494	A3
Μαϊ-12	5	2026	A5	Μαϊ-14	29	1703	A4
Ιουν-12	6	2305	A6	Ιουν-14	30	2336	A6
Ιουλ-12	7	2071	A5	Ιουλ-14	31	1353	A3
Αυγ-12	8	1878	A4	Αυγ-14	32	1848	A4

Σεπ-12	9	1862	A4	Σεπ-14	33	1107	A2
Οκτ-12	10	2088	A5	Οκτ-14	34	1208	A2
Νοε-12	11	3337	A9	Νοε-14	35	1105	A2
Δεκ-12	12	1585	A3	Δεκ-14	36	1001	A2
Ιαν-13	13	714	A1	Ιαν-15	37	1162	A2
Φεβ-13	14	1636	A4	Φεβ-15	38	1298	A2
Μαρ-13	15	2406	A6	Μαρ-15	39	1106	A2
Απρ-13	16	3149	A9	Απρ-15	40	1438	A3
Μαϊ-13	17	2123	A5	Μαϊ-15	41	971	A1
Ιουν-13	18	1421	A3	Ιουν-15	42	1891	A4
Ιουλ-13	19	2210	A6	Ιουλ-15	43	1997	A5
Αυγ-13	20	2949	A8	Αυγ-15	44	3511	A10
Σεπ-13	21	2360	A6	Σεπ-15	45	2640	A7
Οκτ-13	22	2386	A6	Οκτ-15	46	2188	A5
Νοε-13	23	2180	A5	Νοε-15	47	2416	A6
Δεκ-13	24	2539	A7	Δεκ-15	48	1819	A4

Από τον Πίνακα 2, με τη χρήση του Ορισμού 4, προκύπτουν οι παρακάτω 48 ασαφείς λογικές σχέσεις:

$$\tilde{A}_3 \rightarrow \tilde{A}_{12}, \tilde{A}_{12} \rightarrow \tilde{A}_5, \tilde{A}_5 \rightarrow \tilde{A}_2, \tilde{A}_2 \rightarrow \tilde{A}_5, \dots, \tilde{A}_{10} \rightarrow \tilde{A}_7, \tilde{A}_7 \rightarrow \tilde{A}_5, \tilde{A}_5 \rightarrow \tilde{A}_6, \tilde{A}_6 \rightarrow \tilde{A}_4$$

Από αυτές τις ασαφείς λογικές σχέσεις δημιουργούνται οι ασαφείς λογικές ομάδες

Πίνακας 3
Ομάδες ασαφών λογικών σχέσεων

Ομάδα	Ασαφείς λογικές ομάδες
1	$\tilde{A}_1 \rightarrow \tilde{A}_4$
2	$\tilde{A}_2 \rightarrow \tilde{A}_2, \tilde{A}_2 \rightarrow \tilde{A}_3, \tilde{A}_2 \rightarrow \tilde{A}_5$
3	$\tilde{A}_3 \rightarrow \tilde{A}_1, \tilde{A}_3 \rightarrow \tilde{A}_4, \tilde{A}_3 \rightarrow \tilde{A}_6, \tilde{A}_3 \rightarrow \tilde{A}_{12}$
4	$\tilde{A}_4 \rightarrow \tilde{A}_2, \tilde{A}_4 \rightarrow \tilde{A}_3, \tilde{A}_4 \rightarrow \tilde{A}_4, \tilde{A}_4 \rightarrow \tilde{A}_5, \tilde{A}_4 \rightarrow \tilde{A}_6$
5	$\tilde{A}_5 \rightarrow \tilde{A}_2, \tilde{A}_5 \rightarrow \tilde{A}_3, \tilde{A}_5 \rightarrow \tilde{A}_4, \tilde{A}_5 \rightarrow \tilde{A}_6, \tilde{A}_5 \rightarrow \tilde{A}_7, \tilde{A}_5 \rightarrow \tilde{A}_9, \tilde{A}_5 \rightarrow \tilde{A}_{10}$
6	$\tilde{A}_6 \rightarrow \tilde{A}_3, \tilde{A}_6 \rightarrow \tilde{A}_4, \tilde{A}_6 \rightarrow \tilde{A}_5, \tilde{A}_6 \rightarrow \tilde{A}_6, \tilde{A}_6 \rightarrow \tilde{A}_8, \tilde{A}_6 \rightarrow \tilde{A}_9$
7	$\tilde{A}_7 \rightarrow \tilde{A}_5$
8	$\tilde{A}_8 \rightarrow \tilde{A}_6$
9	$\tilde{A}_9 \rightarrow \tilde{A}_3, \tilde{A}_9 \rightarrow \tilde{A}_4, \tilde{A}_9 \rightarrow \tilde{A}_5$
10	$\tilde{A}_{10} \rightarrow \tilde{A}_7$
11	$\tilde{A}_{12} \rightarrow \tilde{A}_5$

Βήμα 4: Παράγουμε τα εξαγόμενα των προβλέψεων και υπολογίζουμε τις τελικές προβλεπόμενες τιμές

Εάν η τιμή Dv_{t-1} την χρονική στιγμή $t-1$ είναι \tilde{A}_j , η προβλεπόμενη τιμή για τη χρονική στιγμή t , συμβολίζεται με \tilde{O}_t και προσδιορίζεται από τους παρακάτω τρεις ευρετικούς κανόνες.

Κανόνας 1: Εάν η ομάδα των ασαφών λογικών σχέσεων του \tilde{A}_j είναι κενή, δηλαδή εάν $\tilde{A}_j \rightarrow \emptyset$, τότε η τιμή \tilde{O}_t είναι \tilde{A}_j , που είναι $(d_{j-1}, d_j, d_{j+1}, d_{j+2})$.

Κανόνας 2: Εάν η ομάδα των ασαφών λογικών σχέσεων του \tilde{A}_j είναι ένα-προς-ένα, δηλαδή εάν $\tilde{A}_j \rightarrow \tilde{A}_k$, τότε η τιμή \tilde{O}_t είναι \tilde{A}_k , που είναι $(d_{k-1}, d_k, d_{k+1}, d_{k+2})$.

Κανόνας 3: Εάν η ομάδα των ασαφών λογικών σχέσεων του \tilde{A}_j είναι ένα-προς-πολλά, δηλαδή εάν $\tilde{A}_j \rightarrow \tilde{A}_{k1}, \tilde{A}_j \rightarrow \tilde{A}_{k2}, \dots, \tilde{A}_j \rightarrow \tilde{A}_{kp}$, τότε η τιμή \tilde{O}_t υπολογίζεται ως εξής:

$$\tilde{O}_t = \frac{\tilde{A}_{k1} \oplus \tilde{A}_{k2} \oplus \dots \oplus \tilde{A}_{kp}}{p} = \left(\frac{d_{k1-1} + \dots + d_{kp-1}}{p}, \frac{d_{k1} + \dots + d_{kp}}{p}, \frac{d_{k1+1} + \dots + d_{p1+1}}{p}, \frac{d_{k1+2} + \dots + d_{p1+2}}{p} \right) \text{ όπου,}$$

$$\tilde{A}_{k1} = (d_{k1-1}, d_{k1}, d_{k1+1}, d_{k1+2}), \tilde{A}_{k2} = (d_{k2-1}, d_{k2}, d_{k2+1}, d_{k2+2}), \dots, \tilde{A}_{kp} = (d_{kp-1}, d_{kp}, d_{kp+1}, d_{kp+2})$$

Τα εξαγόμενα \tilde{O}_t που υπολογίζονται από τους παραπάνω κανόνες δεν είναι οι τελικές προβλεπόμενες τιμές καθώς παράγονται χωρίς να λάβουμε υπόψη την εποχικότητα..

Η τελική προβλεπόμενη τιμή F_t , για τη χρονική στιγμή t προσδιορίζεται από τη σχέση $\tilde{F}_t = Si_t \cdot \tilde{O}_t = (Si_t \cdot a_t, Si_t \cdot b_t, Si_t \cdot c_t, Si_t \cdot d_t)$, όπου Si_t οι εποχικοί δείκτες.

Για παράδειγμα, τον Ιανουάριο του 2012, έχουμε $Dv_1 = 1557 \in \tilde{A}_3$

Επομένως, για τον Φεβρουάριο του 2012 έχουμε:

$$\tilde{O}_2 = \frac{\tilde{A}_1 \oplus \tilde{A}_4 \oplus \tilde{A}_6 \oplus \tilde{A}_{12}}{4} = (1900, 2125, 2425, 2650)$$

Η τελική προβλεπόμενη τιμή είναι:

$$\tilde{F}_2 = Si_2 \cdot \tilde{O}_2 = (558, 624, 712, 778)$$

Τον Φεβρουάριο του 2012, έχουμε $Dv_2 = 4117 \in \tilde{A}_{12}$.

Επομένως, για τον Μάρτιο του 2012 έχουμε:

$$\tilde{O}_3 = \tilde{A}_5 = (1600, 1900, 2200, 1726)$$

Η τελική προβλεπόμενη τιμή είναι:

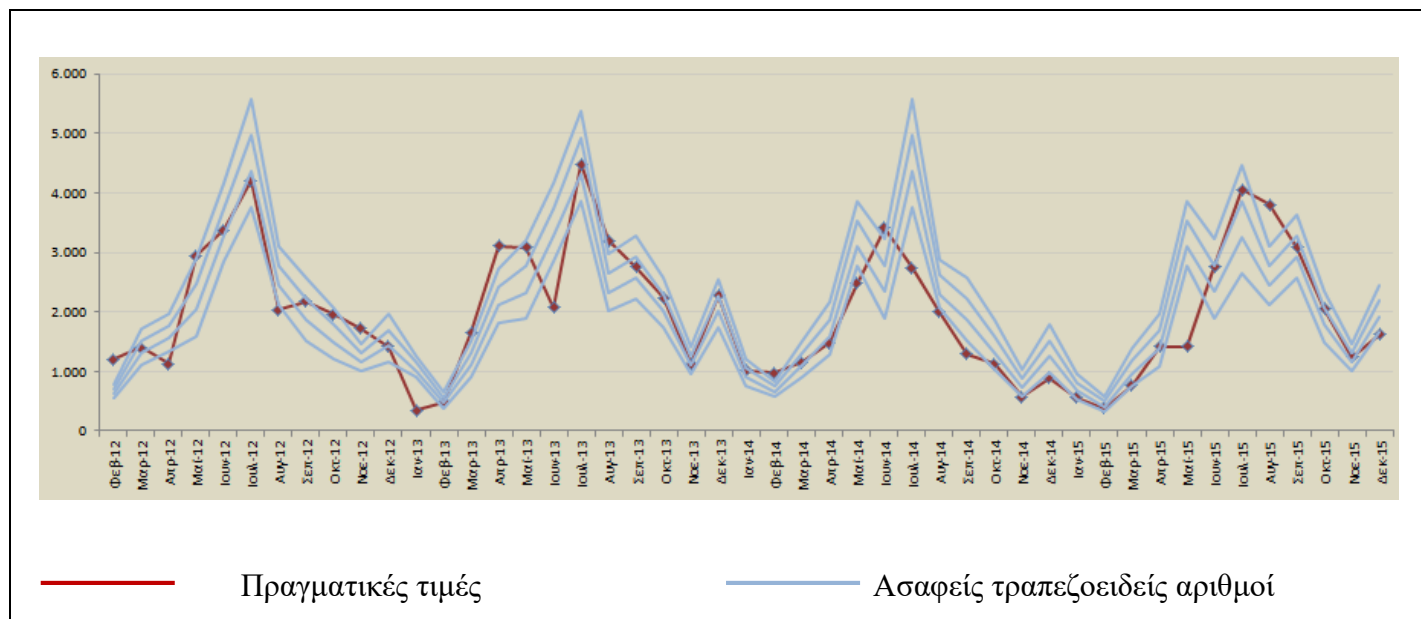
$$\tilde{F}_3 = Si_3 \cdot \tilde{O}_3 = (1105, 1312, 1519, 1726)$$

⋮

Συνεχίζοντας με παρόμοιο τρόπο, υπολογίζουμε τις προβλεπόμενες τιμές για όλους τους επόμενους μήνες.

Για την κατασκευή του μοντέλου χρησιμοποιήθηκαν 48 παρατηρήσεις (Ιανουάριος 2012 – Δεκέμβριος 2015). Στο Σχήμα 3 παρατηρούμε μια πολύ καλή προσαρμογή του μοντέλου, καθώς το σύνολο, σχεδόν, των πραγματικών τιμών περιέχεται στους ασαφείς τραπεζοειδείς αριθμούς.

Σχήμα 3
Προσαρμογή του μοντέλου



Θα πρέπει επίσης να επισημάνουμε ότι στα σημεία που εμφανίζονται «αστοχίες» στην προσαρμογή του μοντέλου οι πραγματικές τιμές φαίνεται να είναι απροσδόκητα μεγάλες ή μικρές για τον συγκεκριμένο μήνα. Για παράδειγμα, τον Φεβρουάριο του 2012 οι αφίξεις ήταν 1208, πολύ υψηλές σε σχέση με άλλα έτη (480 τον Φεβρουάριο του 2013, 973 τον Φεβρουάριο του 2014, 381 τον Φεβρουάριο του 2014). Επίσης, τον Ιούνιο του 2013 οι αφίξεις ήταν 2078, πολύ χαμηλότερες σε σχέση με άλλα έτη (3371 τον Ιούνιο του 2012, 3414 τον Ιούνιο του 2014, 2766 τον Ιούνιο του 2015). Είναι, επομένως, προφανές ότι εάν είχε προηγηθεί μια προσαρμογή αυτών των έκτροπων τιμών της αρχικής σειράς των δεδομένων το μοντέλο θα είχε ακόμα καλύτερη προσαρμογή.

Στον Πίνακα 4 που ακολουθεί παρουσιάζονται όλα τα αποτελέσματα.

Πίνακας 4
Προβλέψεις τω αφίξεων τουριστών από τη Β . Αμερική στην Κύπρο

Μήνας	t	Αφίξεις Αρχικές τιμές R_t	Προβλέψεις \tilde{F}_t	Μήνας	t	Αφίξεις Αρχικές τιμές R_t	Προβλέψεις \tilde{F}_t
Ιαν-12	1	746		Ιαν-14	25	1017	(767, 911, 1054, 1198)
Φεβ-12	2	1208	(558, 624, 712, 778)	Φεβ-14	26	973	(572, 660, 748, 836)
Μαρ-12	3	1400	(1105, 1312, 1519, 1726)	Μαρ-14	27	1159	(898, 1105, 1312, 1519)
Απρ-12	4	1123	(1346, 1554, 1761, 1968)	Απρ-14	28	1477	(1285, 1581, 1878, 2174)
Μαϊ-12	5	2947	(1600, 2037, 2473, 2910)	Μαϊ-14	29	2478	(2764, 3091, 3528, 3855)
Ιουν-12	6	3371	(2852, 3291, 3730, 4168)	Ιουν-14	30	3417	(1901, 2340, 2779, 3218)
Ιουλ-12	7	4207	(3758, 4367, 4976, 5586)	Ιουλ-14	31	2748	(3758, 4367, 4976, 5586)
Αυγ-12	8	2037	(2115, 2440, 2765, 3091)	Αυγ-14	32	2004	(2060, 2304, 2630, 2874)
Σεπ-12	9	2174	(1518, 1868, 2218, 2569)	Σεπ-14	33	1292	(1518, 1868, 2218, 2569)
Οκτ-12	10	1957	(1219, 1500, 1781, 2062)	Οκτ-14	34	1132	(1031, 1312, 1594, 1875)
Νοε-12	11	1724	(1007, 1162, 1317, 1472)	Νοε-14	35	571	(568, 723, 878, 1033)

Δεκ-12	12	1417	(1162, 1430, 1698, 1967)		Δεκ-14	36	895	(983, 1251, 1520, 1788)
Ιαν-13	13	342	(911, 1018, 1162, 1270)		Ιαν-15	37	557	(527, 671, 815, 959)
Φεβ-13	14	480	(381, 470, 558, 646)		Φεβ-15	38	381	(323, 411, 499, 587)
Μαρ-13	15	1661	(898, 1105, 1312, 1519)		Μαρ-15	39	764	(760, 967, 1174, 1381)
Απρ-13	16	3112	(1828, 2125, 2421, 2718)		Απρ-15	40	1421	(1087, 1384, 1680, 1977)
Μαϊ-13	17	3089	(1891, 2328, 2764, 3201)		Μαϊ-15	41	1413	(2764, 3091, 3528, 3855)
Ιουν-13	18	2078	(2852, 3291, 3730, 4168)		Ιουν-15	42	2766	(1901, 2340, 2779, 3218)
Ιουλ-13	19	4488	(3859, 4316, 4926, 5383)		Ιουλ-15	43	4057	(2641, 3250, 3859, 4469)
Αυγ-13	20	3198	(2006, 2332, 2657, 2982)		Αυγ-15	44	3808	(2115, 2440, 2765, 3091)
Σεπ-13	21	2755	(2218, 2569, 2919, 3269)		Σεπ-15	45	3082	(2569, 2919, 3269, 3619)
Οκτ-13	22	2237	(1734, 2015, 2297, 2578)		Οκτ-15	46	2051	(1500, 1781, 2062, 2344)
Νοε-13	23	1126	(956, 1111, 1266, 1421)		Νοε-15	47	1248	(1007, 1162, 1317, 1472)
Δεκ-13	24	2270	(1743, 2011, 2279, 2548)		Δεκ-15	48	1626	(1654, 1922, 2190, 2458)

Στην πράξη, για τη λήψη αποφάσεων, αυτό που μας ενδιαφέρει περισσότερο είναι ο υπολογισμός διαστημάτων τιμών για τις αφίξεις των τουριστών ως προς κάποιο βαθμό εμπιστοσύνης α , $0 \leq \alpha \leq 1$

Για την εκτίμηση αυτών των διαστημάτων αρκεί να υπολογίσουμε τις α – τομές του αντίστοιχου ασαφούς αριθμού οι βρίσκονται από τον τύπο (Χρήστος Τζιμόπουλος, Βασίλης Παπαδόπουλος, 2013)

$${}^{\alpha}A = [a_{\ell}^{(\alpha)}, a_r^{(\alpha)}] = [(a_2 - a_1)\alpha + a_1, a_4 - (a_4 - a_3)\alpha], \quad 0 \leq \alpha \leq 1$$

Έστω, για παράδειγμα, ο μήνας Δεκέμβριος του 2013.

$$\tilde{F}_{24} = (1743, 2011, 2279, 2548)$$

$$\text{Τότε, } {}^{\alpha}A = [a_{\ell}^{(\alpha)}, a_r^{(\alpha)}] = [268\alpha + 1743, 2548 - 269\alpha], \quad 0 \leq \alpha \leq 1$$

Στον πίνακα 5 παρουσιάζονται οι εκτιμήσεις των διαστημάτων για τον Δεκέμβριο του 2013.

Πίνακας 5
Εκτίμηση διαστημάτων για το μήνα Δεκ - 2013

α	Εκτίμηση Διαστημάτων
0	[1743, 2548]
0.1	[1770, 2521]
0.2	[1797, 2494]
0.3	[1823, 2467]
0.4	[1850, 2440]
0.5	[1877, 2414]
0.6	[1904, 2387]
0.7	[1931, 2360]
0.8	[1957, 2333]
0.9	[1984, 2306]
1.0	[2011, 2279]

Θα πρέπει, στο σημείο αυτό, να διευκρινίσουμε ότι τα παραπάνω διαστήματα δεν είναι τα διαστήματα εμπιστοσύνης με την έννοια που τα ορίζουμε στη θεωρία των πιθανοτήτων ούτε έχουν την ίδια ερμηνεία και χρήση.

Είναι διαστήματα που παράγονται από τις α - τομές των τραπεζοειδών ασαφών αριθμών (για $\alpha = 0$ έχουμε τη μεγάλη βάση του τραπεζίου ενώ για $\alpha = 1$ τη μικρή βάση). Αυτοί οι ασαφείς αριθμοί, με τη σειρά τους, αντιστοιχούν σε κάποιες γλωσσικές μεταβλητές. Αν λοιπόν, για τον Δεκέμβριο του 2015, θεωρήσουμε ότι ο ασαφής τραπεζοειδής αριθμός (1743, 2011, 2279, 2548) αντιστοιχεί στη γλωσσική μεταβλητή «χαμηλές αφίξεις», αυτό που γνωρίζουμε είναι ότι για τις τιμές 1984 – 2306 ο βαθμός συμμετοχής τους στις «χαμηλές αφίξεις» είναι $\alpha = 0.9$

4. Συμπεράσματα

Αυτό που είναι ιδιαίτερα σημαντικό και διαφορετικό με τα μοντέλα των ασαφών χρονολογικών σειρών σε σχέση με τα στατιστικά, είναι ότι εδώ δεν μας ενδιαφέρει τόσο η ακρίβεια όσο η «ταξινόμηση» σε καταστάσεις που την πετυχαίνουμε με τη χρήση γλωσσικών μεταβλητών.

Εδώ το ενδιαφέρον μας δεν περιορίζεται στην παραγωγή μιας αριθμητικής πρόβλεψης, στην πραγματικότητα προβλέπουμε με αυτά τα μοντέλα την κατάσταση που θα βρεθούμε την επόμενη χρονική στιγμή και όχι η ακρίβεια της πρόβλεψης.

Βλέποντας μια ομάδα ασαφών σχέσεων, για παράδειγμα του A1 ή A2, λέμε ότι «Αν την χρονική στιγμή t οι αφίξεις είναι A1 τότε την χρονική στιγμή $t+1$ θα είναι A2». Αυτές όμως είναι καταστάσεις, για παράδειγμα A1 μπορεί να σημαίνει «λίγο», A2 «μέτριο» κ.ο.κ.

Έχουμε δηλαδή ένα σύστημα κανόνων, το οποίο το χρησιμοποιούμε όταν ο στόχος μας δεν είναι η ακρίβεια αλλά η λήψη αποφάσεων. Και αυτό σε κάποιες περιπτώσεις, όπως στον τουρισμό, είναι το ζητούμενο.

Δεν μας ενδιαφέρει αν μετά από 20.000 αφίξεις ακολουθούν 25.250, αλλά αν μετά από μια περίοδο πολλών αφίξεων ακολουθεί μια περίοδος «πάρα πολλών» ή «μέτριων» κ.λπ.. Αυτό είναι αρκετό για τον προγραμματισμό μας. Και βεβαίως με την βοήθεια της τεχνολογίας, η ταχύτητα που λαμβάνουμε την πληροφόρηση αυτή είναι αναμφισβήτητα τεράστια.

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Η Τουριστική Διάσταση του Προγράμματος Φιλοξενίας Εμπορικών Επισκεπτών (Hosted Buyers Programme) της ΔΕΘ-HELEXPO. Μια Πρώτη Αποτίμηση για την Περίοδο 2014-2016

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Περίληψη

Οι Εμπορικές Εκθέσεις αποτελούν έναν θεσμό με μακρά ιστορία που χάνεται στο βάθος των αιώνων και διαρκεί μέχρι και σήμερα. Στη βιβλιογραφία οι εμπορικές εκθέσεις συνδέονται με τις εμποροπανηγύρεις στην αρχαιότητα. Σε κάθε ιστορική περίοδο οι Εμπορικές Εκθέσεις από την αρχαιότητα μέχρι σήμερα αλληλεπιδρούσαν πολυεπίπεδα με τον τόπο φιλοξενίας τους. Ένας τομέας στον οποίο οι εμπορικές εκθέσεις συνέβαλαν σημαντικά σε κάθε ιστορική περίοδο, είναι η τουριστική ανάπτυξη του τόπου φιλοξενίας.

Τις τελευταίες δεκαετίες ο διεθνής ανταγωνισμός στο κλάδο της εκθεσιακής βιομηχανίας έχει γίνει εντονότερος, καθώς σε όλες σχεδόν τις χώρες του κόσμου διοργανώνονται πλέον Διεθνείς Εμπορικές Εκθέσεις. Μέσα σε αυτό το ανταγωνιστικό πλαίσιο οι Διοργανωτές Εμπορικών Εκθέσεων στην προσπάθειά τους να διαφοροποιηθούν και να εξασφαλίσουν τη μεγαλύτερη δυνατή ικανοποίηση των Εκθετών τους, υλοποιούν προγράμματα φιλοξενίας ξένων εμπορικών επισκεπτών στις διοργανώσεις τους. Στο πλαίσιο των προγραμμάτων αυτών, οι Διοργανωτές προσκαλούν και φιλοξενούν επιλεγμένους Εμπορικούς Επισκέπτες που αποτελούν δυνητικούς αγοραστές των προϊόντων / υπηρεσιών του εκάστοτε κλάδου που εκπροσωπείται στην κάθε κλαδική έκθεση, οι οποίοι κλείνουν προκαθορισμένα ραντεβού (b2b meetings) με τους Εκθέτες. Σκοπός αυτών των ραντεβού είναι η επίτευξη εμπορικών συμφωνιών και η προώθηση με αυτό τον τρόπο της εξαγωγικής δραστηριότητας των επιχειρήσεων (Εκθετών).

Στην παρούσα εργασία επικεντρωνόμαστε στην περίπτωση της Θεσσαλονίκης, η οποία διαθέτει μια μακρά εκθεσιακή ιστορία. Μάλιστα η νεώτερη και σύγχρονη ιστορία της πόλης είναι συνυφασμένη με την ιστορία της Έκθεσης, που διατηρεί πλέον μια 90χρονη παράδοση. Στα 90 χρόνια της εκθεσιακής ιστορίας της Θεσσαλονίκης, η Έκθεση πάντοτε αλληλεπιδρούσε σημαντικά με την πόλη σε πολλά επίπεδα μεταξύ αυτών και στον τουρισμό.

Η ΔΕΘ-HELEXPO θέλοντας να ανταποκριθεί στις σύγχρονες ανάγκες των επιχειρήσεων και προκειμένου να καταστήσει τις Εμπορικές Εκθέσεις που διοργανώνει ανταγωνιστικές σε διεθνές επίπεδο, έχει εκπονήσει πρόγραμμα φιλοξενίας εμπορικών επισκεπτών στις διοργανώσεις της εδώ και δυο περίπου δεκαετίες. Οι προσπάθειες αυτές τα τελευταία χρόνια και συγκριμένα από το 2014 και μετά γίνονται εντονότερες, πιο οργανωμένες και με πιο συστηματικό τρόπο με το Πρόγραμμα Φιλοξενίας Ξένων Εμπορικών Επισκεπτών (Hosted Buyers Program) σε όλες τις κλαδικές εκθέσεις της ΔΕΘ-HELEXPO.

Μέσα στην τριετία 2014-2016, έχουν φιλοξενηθεί περίπου 1.000 ξένοι εμπορικοί επισκέπτες από όλες σχεδόν τις περιοχές του πλανήτη. Τα αποτελέσματα του προγράμματος αυτού είναι αξιόλογα, καθώς έχουν συναφθεί σημαντικές εμπορικές συμφωνίες μεταξύ ελληνικών και ξένων επιχειρήσεων, συμβάλλοντας στην αύξηση των ελληνικών εξαγωγών.

Πέρα όμως από το καθαρά επιχειρηματικό αποτέλεσμα, το Πρόγραμμα Φιλοξενίας Εμπορικών Επισκεπτών έχει σημαντική συμβολή και στην τουριστική ανάπτυξη της πόλης. Ακριβώς αυτή τη συμβολή θα επιχειρήσουμε με την παρούσα εργασία να διερευνήσουμε. Η διερεύνηση θα

πραγματοποιηθεί μέσα από μια πρωτογενή έρευνα με τη χρήση ερωτηματολογίου στους εμπορικούς επισκέπτες που έχουν φιλοξενηθεί στη Θεσσαλονίκη κατά την περίοδο 2014-2016.

Λέξεις Κλειδιά: Εμπορικές Εκθέσεις, Πρόγραμμα Φιλοξενίας Εμπορικών Επισκεπτών, Τουρισμός, Θεσσαλονίκη, Hosted Buyers Program

1. ΕΙΣΑΓΩΓΗ - ΜΕΘΟΔΟΛΟΓΙΑ

Οι εμπορικές εκθέσεις διαθέτουν μακρά ιστορία, καθώς η ιστορία τους είναι συνυφασμένη με την εξέλιξη και την πρόοδο των κοινωνιών. Η ίδια ταύτιση υπάρχει και στην περίπτωση της Θεσσαλονίκης, όπου η ιστορία της έκθεσης εξελίσσεται παράλληλα με την ιστορία της πόλης. Η Διεθνής Έκθεση Θεσσαλονίκης στα 90 χρόνια ιστορίας της διαρκώς παρουσίαζε σημαντική αλληλεπίδραση με την πόλη σε πολλά επίπεδα μεταξύ αυτών και στον τουρισμό.

Μέσα σε αυτό το ιστορικό πλαίσιο, η ΔΕΘ-HELEXPO στην προσπάθεια της να καταστεί ανταγωνιστική σε διεθνές περιβάλλον και για να ανταποκριθεί στις σύγχρονες ανάγκες των επιχειρήσεων, εκπονεί εδώ και περίπου δυο δεκαετίες Πρόγραμμα Φιλοξενίας Ξένων Εμπορικών Επισκεπτών (Hosted Buyers Program) σε όλες τις κλαδικές της εκθέσεις. Στο πλαίσιο του προγράμματος αυτού, η ΔΕΘ-HELEXPO προσκαλεί και φιλοξενεί επιλεγμένους Εμπορικούς Επισκέπτες που αποτελούν δυνητικούς αγοραστές των προϊόντων / υπηρεσιών του εκάστοτε κλάδου που εκπροσωπείται στην κάθε κλαδική έκθεση, οι οποίοι κλείνουν προκαθορισμένα ραντεβού (b2b meetings) με τους Εκθέτες. Σκοπός αυτών των ραντεβού είναι η επίτευξη εμπορικών συμφωνιών και η προώθηση με αυτό τον τρόπο της εξαγωγικής δραστηριότητας των επιχειρήσεων (Εκθετών). Τα τελευταία χρόνια και συγκριμένα από το 2014 και μετά το Πρόγραμμα Φιλοξενίας Ξένων Εμπορικών Επισκεπτών της ΔΕΘ-HELEXPO έχει αποκτήσει ένα πιο οργανωμένο και συστηματικό χαρακτήρα καλύπτοντας το σύνολο των κλαδικών εκθέσεων που διοργανώνονται.

Στην παρούσα εργασία επικεντρώναστε στην περίπτωση της Θεσσαλονίκης και πιο συγκεκριμένα στην διερεύνηση της επίδρασης που έχει στην πόλη η εκθεσιακή δραστηριότητα μέσα από το πρόγραμμα φιλοξενίας εμπορικών επισκεπτών που υλοποιεί η ΔΕΘ-HELEXPO στις διοργανώσεις της. Η κεντρική υπόθεση εργασίας αφορά στη διερεύνηση της τουριστικής διάστασης του προγράμματος αυτού, που μπορεί να μην είναι ο κεντρικός άξονας του, αλλά έχει σημαντική τουριστική συμβολή, ιδιαίτερα κατά την τελευταία περίοδο (2014-2016). Έτσι οι προσκεκλημένοι στις εμπορικές εκθέσεις μπορεί να επισκέπτονται τη Θεσσαλονίκη για εμπορικούς λόγους, όμως γνωρίζουν την πόλη και με τον τρόπο αυτό αναπτύσσονται τουριστικές δυναμικές για την πόλη.

Μεθοδολογικά στην παρούσα εργασία κινούμαστε σε δυο άξονες, αρχικά η διερεύνηση της επίδρασης που έχει στην πόλη η εκθεσιακή δραστηριότητα μέσα από το πρόγραμμα φιλοξενίας εμπορικών επισκεπτών πραγματοποιείται μέσα από τη διεθνή βιβλιογραφία του πεδίου της επίδρασης των εμπορικών εκθέσεων στον τουρισμό. Στη συνέχεια η διερεύνησή μας επικεντρώνεται στην μελέτη περίπτωσης της Θεσσαλονίκης μέσα από την πρωτογενή έρευνα στους συμμετέχοντες στο πρόγραμμα, Hosted Buyers, τα τελευταία χρόνια (2014-2016). Η έρευνα πραγματοποιήθηκε με τη χρήση ειδικά διαμορφωμένου ερωτηματολογίου για τις ανάγκες της παρούσας έρευνας.

2. ΕΠΙΔΡΑΣΗ ΕΚΘΕΣΕΩΝ ΣΤΟΝ ΤΟΥΡΙΣΜΟ

Οι εκθέσεις κατέχουν σήμερα μια ισχυρή και παραδοσιακή πλέον θέση ως προϊόν, στην παγκόσμια τουριστική αγορά (Κοκκώσης κ.α. 2011), ενώ γενικότερα ο τομέας των MICE (Meetings, Incentives, Conventions, and Exhibitions) αποτελεί έναν από τους ταχύτερα αναπτυσσόμενους τομείς της τουριστικής βιομηχανίας σε παγκόσμιο επίπεδο (Campiranon & Arcodia, 2007). Ειδικότερα, ο τομέας των εκθέσεων έχει διαπιστωθεί ότι έχει εξαιρετική συμβολή και προσφέρει τεράστιες δυνατότητες στους τουριστικούς προορισμούς (Wu & Zhang, 2013). Η συμβολή των εκθέσεων και των λοιπών σχετικών επαγγελματικών εκδηλώσεων στον τουρισμό, έχει προσελκύσει ιδιαίτερα το ενδιαφέρον, τόσο των ερευνητών όσο και των υπεύθυνων χάραξης τουριστικής πολιτικής σε παγκόσμιο επίπεδο (Lee et al. 2008).

Χαρακτηριστικό είναι το γεγονός άλλωστε ότι πολλές παλαιότερα βιομηχανικές πόλεις της Ευρώπης και των Η.Π.Α. έχουν καταφέρει να αναγεννήσουν τις οικονομίες τους με επιτυχία, μέσω επενδύσεων σε τέτοιου είδους εκδηλώσεις (Hankinson, 2005). Πολλές πόλεις έχουν χρησιμοποιήσει τις εκθέσεις, ιδιαίτερα τις Παγκόσμιες Εκθέσεις EXPO, για την αναζωογόνηση των οικονομιών τους, τη δημιουργία υποδομών και τη βελτίωση της εικόνας τους (Richards & Wilson, 2004). Δεν είναι τυχαίο άλλωστε το γεγονός ότι οι εκθέσεις χρησιμοποιούνται ως βασικό μέσο τουριστικής ανάπτυξης, τόσο από βιομηχανικές πόλεις, σε μια προσπάθεια διαφοροποίησης και εκσυγχρονισμού των οικονομιών τους, όσο και από παραδοσιακά παραθαλάσσια τουριστικά θέρετρα, με σκοπό την επέκταση της τουριστικής τους περιόδου και την προσέλκυση «ποιοτικών» επισκεπτών (Swarbrooke & Horner, 2001).

Οι εκθέσεις χρησιμοποιούνται συχνά ως μέσο προβολής και διαφοροποίησης των τουριστικών προορισμών. Η παγκοσμιοποίηση είχε ως αποτέλεσμα οι υποδομές και η ποιότητα ζωής στις μεγάλες πόλεις να ομογενοποιηθούν, με αποτέλεσμα να αναζητούνται πλέον τρόποι διαφοροποίησης, μεταξύ των οποίων ξεχωρίζει και ο τομέας των εκθέσεων (Kowalik, 2012), καθώς οι εκθέσεις αποτελούν εξειδικευμένες εκδηλώσεις οι οποίες συνεισφέρουν στην εξειδίκευση των πόλεων που τις φιλοξενούν. Η διαφοροποίηση και εξειδίκευση που προσφέρουν οι εκθέσεις στους προορισμούς, προέρχεται κυρίως από τους εξής παράγοντες (Cuadrado-Roura & Rubalcaba-Bermejo, 1998):

- Ανάπτυξη σχετικών κλάδων: οι οικονομικοί κλάδοι που συμμετέχουν στις εκθέσεις παρέχουν εξειδίκευση, μέσω της βελτίωσης της παραγωγής και των πωλήσεων στους αντίστοιχους τομείς της πόλης.
- Ανάπτυξη σχετικών υποδομών και εκθεσιακών κέντρων: οι επενδύσεις που πραγματοποιούνται στα πλαίσια της φιλοξενίας των εκθέσεων, συνεισφέρουν στη βελτίωση της προσβασιμότητας, αλλά και γενικότερα της ελκυστικότητας των πόρων και των υποδομών της πόλης.
- Ανάπτυξη και προώθηση της εικόνας του προορισμού: η προώθηση που προκύπτει από την εκθεσιακή δραστηριότητα οδηγεί σε μια διαφοροποίηση, η οποία μπορεί να γίνει καλύτερα κατανοητή από τους τουριστικούς πράκτορες. Οι θετικές προσδοκίες στην περίπτωση αυτή, ευνοούν την εξειδίκευση του προορισμού. Παράλληλα, οι εκθέσεις μπορούν να χρησιμοποιηθούν ως ένα ισχυρό εργαλείο μάρκετινγκ του προορισμού, καθώς ενισχύουν σημαντικά την εικόνα του.

Εκτός από τη δυνατότητα διαφοροποίησης που αναφέρθηκε ανωτέρω, οι εκθέσεις συχνά προσελκύουν το ενδιαφέρον των μέσων ενημέρωσης, με αποτέλεσμα την προβολή του προορισμού και τη βελτίωση της εικόνας του (City of Edmonton, 2010; Xue et al. 2012). Τα μέσα ενημέρωσης φαίνεται να επηρεάζονται θετικά από τη διοργάνωση εκθέσεων, ειδικότερα στην περίπτωση των Παγκόσμιων Εκθέσεων EXPO, με αποτέλεσμα να αντιμετωπίζουν θετικότερα τις πόλεις που τις φιλοξενούν, συμβάλλοντας με τον τρόπο αυτό, στη βελτίωση της εικόνας της πόλης που προβάλλουν στο κοινό (Xue et al. 2012).

Επίσης, έχει διαπιστωθεί ότι οι εκθέσεις ενθαρρύνουν τους επισκέπτες να επισκεφτούν τον προορισμό περισσότερες από μια φορές, καθώς μια επιτυχημένη έκθεση έχει ως αποτέλεσμα την ικανοποίηση των επισκεπτών, με αποτέλεσμα τη δημιουργία μιας βάσης επαναλαμβανόμενων επισκέψεων (City of Edmonton, 2010; Swarbrooke & Horner, 2001), ενώ με την φιλοξενία τέτοιων γεγονότων, οι πόλεις μπορούν να προωθηθούν σε μια σειρά από διαφορετικές δυνητικές αγορές τουριστών (Richards & Wilson, 2004).

Επιπρόσθετα, με τη διοργάνωση των εκθέσεων, οι πόλεις προσελκύουν έναν μεγάλο αριθμό επισκεπτών, αλλά και διοργανωτών και εκθετών, ενώ παράλληλα η διοργάνωση μπορεί να οδηγήσει σε άμεση ή έμμεση αύξηση της προσέλευσης και σε άλλες τοποθεσίες της πόλης, της περιφέρειας, ακόμα και της χώρας. Οι συμμετέχοντες στις εκθέσεις συχνά επισκέπτονται σημεία ενδιαφέροντος στην περιοχή φιλοξενίας, ενώ σε αρκετές περιπτώσεις χρησιμοποιούν την πόλη φιλοξενίας της έκθεσης ως σημείο εκκίνησης για να επισκεφτούν κι άλλα μέρη της χώρας (City of Edmonton, 2010).

Από τα ανωτέρω καθίσταται σαφές ότι τα οφέλη για την πόλη φιλοξενίας των εκθέσεων είναι πολλά, καθώς αναζωογονείται γενικότερα ο τουρισμός στην περιοχή. Επιπλέον, οι σχετικές έρευνες δείχνουν ότι οι επισκέπτες των εκθέσεων συνήθως δαπανούν χρήματα, όχι μόνο σε ξενοδοχεία και εστιατόρια, αλλά και στο λιανικό εμπόριο και στην επίσκεψη τοπικών θεαμάτων, όπως τα μουσεία και τα θέατρα (McCartney, 2008; Swarbrooke & Horner, 2001). Γενικότερα, έχει διαπιστωθεί ότι οι συμμετέχοντες στις εκθέσεις δαπανούν μεγαλύτερα κατά κεφαλήν χρηματικά ποσά ανά ημέρα, από ό,τι οι επισκέπτες του τουρισμού αναψυχής, ενώ θεωρούνται γενικά ως «ποιοτικότεροι» τουρίστες (Swarbrooke & Horner, 2001).

Μια εξίσου σημαντική επίδραση των εκθέσεων στον τουρισμό είναι το γεγονός ότι σε αρκετές περιπτώσεις λαμβάνουν χώρα σε περιόδους εκτός της τουριστικής αιχμής, με αποτέλεσμα να συμβάλλουν σημαντικά στην επίλυση του προβλήματος της εποχικότητας του τουρισμού (Rogerson, 2005; Swarbrooke & Horner, 2001). Τέλος, αξίζει να σημειωθεί ότι οι επισκέπτες των εκθέσεων συμβάλλουν στη βιωσιμότητα των τοπικών επιχειρήσεων και ειδικότερα των τουριστικών επιχειρήσεων και των επιχειρήσεων αναψυχής, οι οποίες ωστόσο χρησιμοποιούνται και από τους τοπικούς κατοίκους (Swarbrooke & Horner, 2001).

3. ΤΟ ΠΡΟΓΡΑΜΜΑ ΦΙΛΟΞΕΝΙΑΣ ΕΜΠΟΡΙΚΩΝ ΕΠΙΣΚΕΠΤΩΝ ΤΗΣ ΔΕΘ-HELEXPO ΓΙΑ ΤΗΝ ΠΕΡΙΟΔΟ 2014-2016

Όπως προαναφέρθηκε και εισαγωγικά, η ΔΕΘ-HELEXPO εδώ και περίπου δυο δεκαετίες υλοποιεί Πρόγραμμα Φιλοξενίας Ξένων Εμπορικών Επισκεπτών (Hosted Buyers Program) σε όλες τις κλαδικές της εκθέσεις. Όμως τα τελευταία χρόνια και συγκριμένα από το 2014 και μετά το Πρόγραμμα Φιλοξενίας Ξένων Εμπορικών Επισκεπτών της ΔΕΘ-HELEXPO έχει αποκτήσει ένα πιο οργανωμένο και συστηματικό χαρακτήρα καλύπτοντας το σύνολο των κλαδικών εκθέσεων που διοργανώνονται.

Μέσα σε αυτή την τριετία 2014-2016, έχουν φιλοξενηθεί συνολικά 1.176 ξένοι εμπορικοί επισκέπτες σε 23 διαφορετικές κλαδικές εκθέσεις της ΔΕΘ-HELEXPO (πίνακας 1.), πραγματοποιώντας πάνω από 17.000 προκαθορισμένα ραντεβού (b2b meetings) με εκθέτες (περίπου 15 ραντεβού κατά μέσο όρο ο κάθε εμπορικός επισκέπτης).

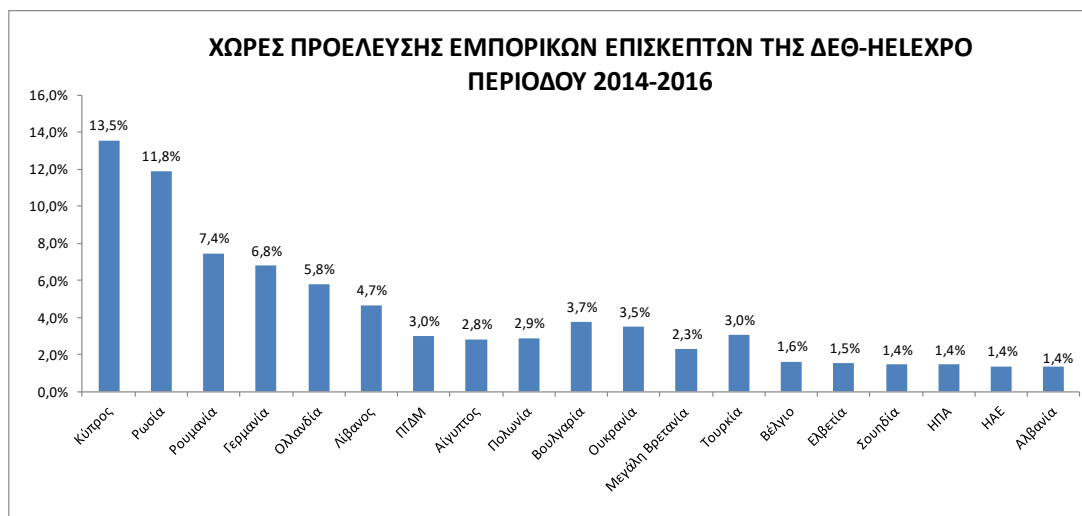
Πίνακας 1. Κατανομή Προσκεκλημένων Εμπορικών Επισκεπτών (Hosted Buyers) στις Κλαδικές Εκθέσεις της ΔΕΘ-HELEXPO της περιόδου 2014-2016

	Έκθεση	Κλάδος	Αριθμός Hosted Buyers
2014	AGROTICA	ΓΕΩΡΓΙΑ	26
	INFACOMA - ENERGYTECH	ΚΑΤΑΣΚΕΥΕΣ - ΕΝΕΡΓΕΙΑ	19
	ΕΛΛΗΝΩΝ ΚΟΣΜΗΜΑ	ΚΟΣΜΗΜΑ	26
	DETROP BOUTIQUE	ΤΡΟΦΙΜΑ-ΠΟΤΑ	33
	KOSMIMA	ΚΟΣΜΗΜΑ	32
	PHILOXENIA	ΤΟΥΡΙΣΜΟΣ	64
	HOTELIA	ΤΟΥΡΙΣΜΟΣ	16
2015	ZOOTECHNIA	ΚΤΗΝΟΤΡΟΦΙΑ	28
	INFACOMA_ENERGYTECH	ΚΑΤΑΣΚΕΥΕΣ - ΕΝΕΡΓΕΙΑ	31
	DETROP - OENOS 2015	ΤΡΟΦΙΜΑ-ΠΟΤΑ	152

2016	FRESKON 2015	ΦΡΕΣΚΑ ΦΡΟΥΤΑ & ΛΑΧΑΝΙΚΑ	152
	HELLENIC JEWELLERY	ΚΟΣΜΗΜΑ	35
	KOSMIMA	ΚΟΣΜΗΜΑ	19
	PHILOXENIA	ΤΟΥΡΙΣΜΟΣ	108
	HOTELIA	ΤΟΥΡΙΣΜΟΣ	9
	AGROTICA	ΓΕΩΡΓΙΑ	33
	INFACOMA-AQUATHERM	ΚΑΤΑΣΚΕΥΕΣ - ΕΝΕΡΓΕΙΑ	22
	DETROP - ARTOZYMA	ΤΡΟΦΙΜΑ-ΠΟΤΑ	105
	ΕΛΛΗΝΩΝ ΚΟΣΜΗΜΑ	ΚΟΣΜΗΜΑ	14
	FRESKON	ΦΡΕΣΚΑ ΦΡΟΥΤΑ & ΛΑΧΑΝΙΚΑ	117
	KOSMIMA	ΚΟΣΜΗΜΑ	14
	HOTELIA	ΤΟΥΡΙΣΜΟΣ	12
	PHILOXENIA	ΤΟΥΡΙΣΜΟΣ	109
	ΣΥΝΟΛΟ		1.176

Πηγή: ΔΕΘ-HELEXPO ΑΕ

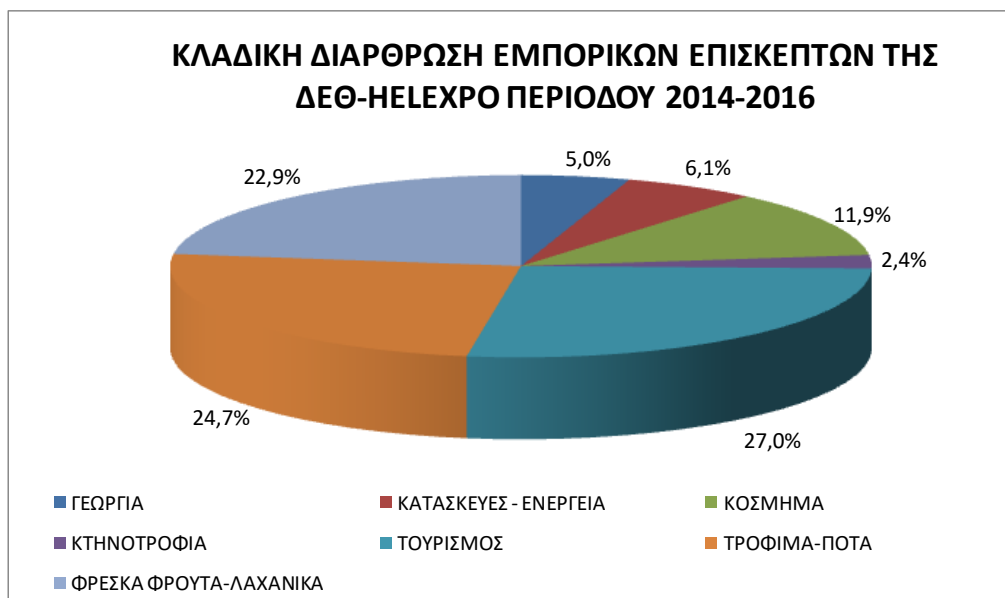
Οι εμπορικοί επισκέπτες που φιλοξενήθηκαν κατά το διάστημα αυτό προέρχονται από 54 διαφορετικές χώρες¹⁷ που καλύπτουν χωρικά όλες σχεδόν τις περιοχές του πλανήτη. Συγκεκριμένα το μεγαλύτερο ποσοστό των (διάγραμμα 1.) προσκεκλημένων εμπορικών επισκεπτών για την εξεταζόμενη περίοδο προέρχεται από την Κύπρο (13,5%), ενώ ακολουθούν η Ρωσία (11,8%), η Ρουμανία (7,4%), η Γερμανία (6,8%), η Ολλανδία (5,8%) και ο Λίβανος (4,7%).



Πηγή: ΔΕΘ-HELEXPO ΑΕ

Διάγραμμα 1. Χώρες Προέλευσης Εμπορικών Επισκεπτών της ΔΕΘ-HELEXPO για την Περίοδο 2014-2016

¹⁷ Αίγυπτος, Αλβανία, Αλγερία, Αυστραλία, Αυστρία, Βέλγιο, Βοσνία-Ερζεγοβίνη, Βουλγαρία, Γαλλία, Γερμανία, Δανία, Ελβετία, Εσθονία, Ηνωμένα Αραβικά Εμιράτα, ΗΠΑ, Ιρλανδία, Ινδία, Ιορδανία, Ιράκ, Ισπανία, Ισραήλ, Ιταλία, Καναδάς, Κατάρ, Κίνα, Κουβέιτ, Κροατία, Κύπρος, Κόστα Ρίκα, Λετονία, Λευκορωσία, Λίβανος, Λιβύη, Λιθουανία, Λουξεμβούργου, Μεγάλη Βρετανία, Μολδαβία, Νορβηγία, Νότια Αφρική, Ολλανδία, Ουγγαρία, Ουκρανία, ΠΙΓΜ, Πολωνία, Ρουμανία, Ρωσία, Σαουδική Αραβία, Σερβία, Σλοβενία, Σουηδία, Τουρκία, Τσεχία, Τυνησία, Χονγκ Κόνγκ



Πηγή: ΔΕΘ-HELEXPO ΑΕ

Διάγραμμα 2. Κλαδική Διάρθρωση Εμπορικών Επισκεπτών της ΔΕΘ-HELEXPO για την Περίοδο 2014-2016

Όσον αφορά την κλαδική διάρθρωση των προσκεκλημένων εμπορικών επισκεπτών που φιλοξενήθηκαν στις εκθέσεις της ΔΕΘ-HELEXPO κατά την εξεταζόμενη περίοδο καλύπτουν το σύνολο των ανταγωνιστικών κλάδων της ελληνικής οικονομίας. Ειδικότερα το 27,% των εμπορικών επισκεπτών δραστηριοποιούνται στον κλάδο του τουρισμού, το 24,7% στον κλάδο των τροφίμων-ποτών, το 22,9% στον κλάδο των φρέσκων φρούτων και λαχανικών και το 11,9 % στο κλάδο του κοσμήματος (διάγραμμα 2.)¹⁸.

Τα αποτελέσματα του προγράμματος την τριετία αυτή σε εμπορικό επίπεδο είναι ιδιαίτερα σημαντικά, καθώς κατά τη διάρκεια των προκαθορισμένων ραντεβού κλείνονται σημαντικές εμπορικές συμφωνίες μεταξύ εκθετών και Hosted Buyers. Έτσι με την υλοποίηση του Προγράμματος Hosted Buyers από την ΔΕΘ-HELEXPO ενισχύονται και διεθνοποιούνται οι κλαδικές της εκθέσεις και ταυτόχρονα ενισχύονται και οι εξαγωγές της χώρας και κατ' επέκταση η ελληνική οικονομία. Πέρα όμως από το καθαρά επιχειρηματικό αποτελέσματα, το Πρόγραμμα Φιλοξενίας Εμπορικών Επισκεπτών έχει σημαντική συμβολή και στην τουριστική ανάπτυξη της πόλης. Ακριβώς αυτή τη συμβολή επιχειρούμε με την παρούσα έρευνα να διερευνήσουμε.

4. ΠΡΩΤΟΓΕΝΗΣ ΕΡΕΥΝΑ

4.1. Πλαίσιο - Ταυτότητα της Έρευνας

Ακολουθώντας την κεντρική υπόθεση εργασίας μας, η οποία (όπως προαναφέρθηκε) αφορά στη διερεύνηση της τουριστικής διάστασης του προγράμματος φιλοξενίας εμπορικών επισκεπτών που υλοποιεί η ΔΕΘ-HELEXPO, πραγματοποιήσαμε πρωτογενή έρευνα στους συμμετέχοντες στο πρόγραμμα για την περίοδο 2014-2016 (1.176 ξένοι εμπορικοί επισκέπτες).

Η έρευνα πραγματοποιήθηκε με τη χρήση ειδικά διαμορφωμένου ερωτηματολογίου για τις ανάγκες της παρούσας έρευνας. Το ερωτηματολόγιό μας περιλάμβανε συνολικά είκοσι ερωτήσεις, οι οποίες κατανέμονταν στις τέσσερις ενότητες του ως εξής:

¹⁸ Στο σημείο αυτό θα πρέπει να αναφερθούν ορισμένες διευκρινήσεις, για την εκθεσιακή δραστηριότητα της ΔΕΘ-HELEXPO την εξεταζόμενη περίοδο 2014-2016: α) οι εκθέσεις AGROTICA και ZOOTECHNIA διοργανώνονται κάθε δυο χρόνια (έτσι κατά την εξεταζόμενη περίοδο έχουμε 2 εκθέσεις AGROTICA και μια έκθεση ZOOTECHNIA), β) η έκθεση FRESCON διοργανώθηκε για πρώτη φορά το 2015. γ) η Έκθεση DETROP το 2015 αποτέλεσε version Boutique (αποκλειστικά προϊόντα Delicatessen)

- στην πρώτη ενότητα περιλαμβάνονται οι ερωτήσεις που αφορούν τα στοιχεία των ερωτώμενων και των επιχειρήσεων που αυτοί εκπροσωπούν
- στη δεύτερη ενότητα περιλαμβάνονται οι ερωτήσεις που αφορούν τη συμμετοχή των ερωτώμενων στο πρόγραμμα Hosted Buyers
- στην τρίτη ενότητα περιλαμβάνονται οι ερωτήσεις που αφορούν την επίσκεψη των ερωτώμενων στη πόλη της Θεσσαλονίκης, αλλά και στην έκθεση
- στην τέταρτη ενότητα περιλαμβάνονται οι ερωτήσεις που αφορούν τις στάσεις και τις απόψεις των ερωτώμενων για την πόλη της Θεσσαλονίκης, κυρίως ως τουριστικό προορισμό.

Οι ερωτήσεις του ερωτηματολογίου ήταν κυρίως κλειστού τύπου όλων των μορφών (διχοτομικές, πολλαπλής απάντησης, likert κλίμακας κλπ.) για την συλλογή ποσοτικών πληροφοριών. Επιπλέον όμως περιλαμβάνονταν και ορισμένες ερωτήσεις ανοικτού τύπου, όπου οι ερωτώμενοι έδιναν ελεύθερες απαντήσεις, ώστε να συλλεχθούν και ποιοτικές πληροφορίες.

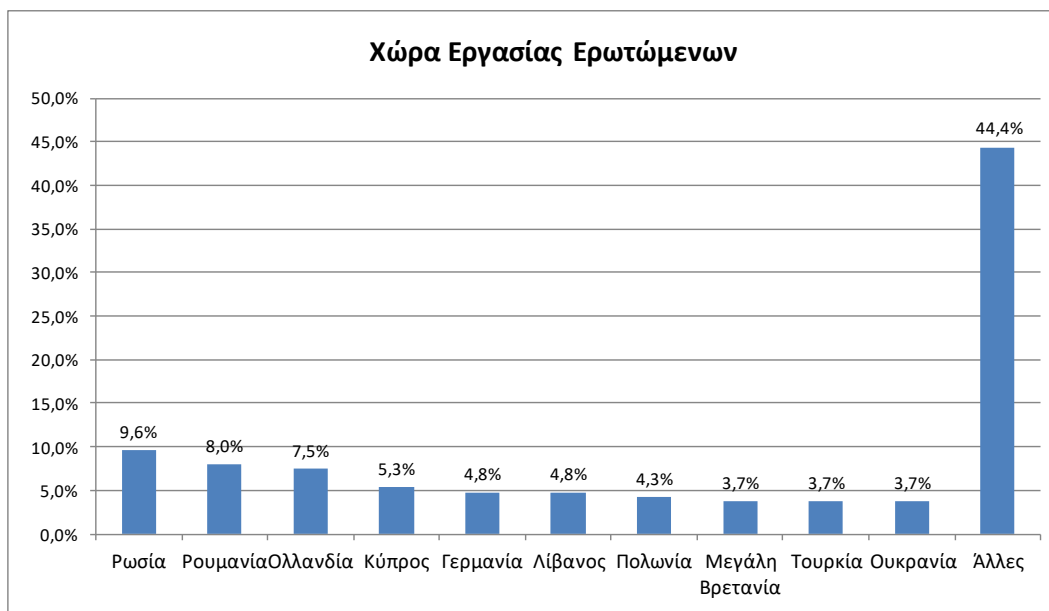
Η συμπλήρωση των ερωτηματολογίων έγινε ηλεκτρονικά, καθώς στάλθηκαν emails στον πληθυσμό της έρευνάς μας και όπου χρειάστηκε δόθηκαν διευκρινήσεις και πάλι ηλεκτρονικά. Η έρευνά μας είχε διάρκεια τριών μηνών, καθώς πραγματοποιήθηκε τους μήνες Ιούλιο-Σεπτέμβριο 2016.

4.2. Περιγραφή Δείγματος

Από τη διαδικασία διεξαγωγής της έρευνάς μας συλλέχθηκαν συνολικά 187 ερωτηματολόγια. Το δείγμα μας καλύπτει τον πληθυσμό της έρευνας σε ποσοστό 15,9%. Στο σημείο αυτό θα πρέπει να σημειώσουμε ότι στους Hosted Buyers των εκθέσεων του 2ου εξαμήνου του 2016, δεν στάλθηκαν ερωτηματολόγια καθώς δεν έχουν πραγματοποιήσει ακόμα την επίσκεψή τους στη Θεσσαλονίκη. Έτσι ουσιαστικά το πραγματικό ποσοστό κάλυψης του πληθυσμού μας είναι ελαφρώς αυξημένο (18,0%).

Το δείγμα μας κρίνεται αρκετά αντιπροσωπευτικό του πληθυσμού καθώς ακολουθεί τα γενικά χαρακτηριστικά των επισκεπτών που έχουν φιλοξενηθεί στην Θεσσαλονίκη κατά την εξεταζόμενη περίοδο. Ειδικότερα το 67,9% του δείγματός μας είναι γυναίκες και το 32,1% άνδρες. Ηλικιακά το δείγμα μας κατανέμεται σε όλες τις ηλικιακές ομάδες με τα μεγαλύτερα ποσοστά να συγκεντρώνονται στις μεσαίες και στις μεγάλες ηλικιακές ομάδες. Συγκεκριμένα το 36,8% των ερωτώμενων είναι 36-50 ετών, το 30,1% είναι 51-65 ετών, το 19,6% είναι 25,35 ετών, το 12,0% είναι μικρότερο των 25 ετών και το 1,4% είναι μεγαλύτερο από 65 ετών.

Όσον αφορά τις χώρες από όπου προέρχονται οι ερωτώμενοι του δείγματός μας, καλύπτουν σχεδόν το σύνολο των χωρών του πληθυσμού (διάγραμμα 3.). Ειδικότερα το μεγαλύτερο ποσοστό των ερωτώμενων, 9,6% προέρχονται από τη Ρωσία, ακολουθεί η Ρουμανία με 8,0%, η Ολλανδία με 7,5%, η Κύπρος με 5,3%, η Γερμανία και ο Λίβανος με 4,8%. Από τη χωρική διάρθρωση του δείγματός μας, η οποία ακολουθεί σε μεγάλο βαθμό την αντίστοιχη χωρική διάρθρωση του πληθυσμού της έρευνάς μας, φαίνονται οι χώρες που αποτελούν τους κύριους οικονομικούς εταίρους της Ελλάδας, αλλά και οι χώρες που αποτελούν τον κύριο στόχο για τις ελληνικές επιχειρήσεις.



Διάγραμμα 3. Κλαδική Διάρθρωση Εμπορικών Επισκεπτών της ΔΕΘ-HELEXPO για την Περίοδο 2014-2016

Στο σημείο αυτό θα πρέπει να αναφέρουμε ότι ένα σημαντικό ποσοστό των συμμετεχόντων στην έρευνά μας, της τάξης του 13,9%, οι οποίοι εργάζονται στις χώρες που προαναφέρθηκαν, είναι ελληνικής καταγωγής.

Επίσης οι συμμετέχοντες στην έρευνά μας αποτελούν κατά βάση είτε ιδιοκτήτες, είτε υψηλόβαθμα στελέχη των επιχειρήσεων που εκπροσωπούν. Ακριβώς αυτό βέβαια αποτελεί και κριτήριο επιλογής των Hosted Buyers, δηλαδή επιλέγονται εκπρόσωποι των επιχειρήσεων που έχουν δικαίωμα να συνάπτουν εμπορικές συμφωνίες για λογαριασμό της επιχείρησης, έτσι ώστε η συμμετοχή τους στην έκθεση να έχει άμεσα αποτελέσματα (σύνταξη εμπορικών συμφωνιών-συναλλαγών). Ειδικότερα το 44,6% των συμμετεχόντων στην έρευνα είναι ιδιοκτήτες-πρόεδροι των επιχειρήσεων που εκπροσωπούν, το 21,5% είναι διευθυντές, το 16,1 είναι υπεύθυνοι προμηθευτών, το 10,2% είναι επιστημονικό προσωπικό, το 4,3% είναι διευθύνοντες σύμβουλοι και το 3,2% είναι μέλη του διοικητικού συμβουλίου.

Σχετικά με τη κλαδική διάρθρωση των επιχειρήσεων που εκπροσωπούνται στο δείγμα μας, αυτές ακολουθούν και την αντίστοιχη κλαδική διάρθρωση του πληθυσμού της έρευνάς μας. Συγκεκριμένα το 38,5% των επιχειρήσεων που εκπροσωπούνται στο δείγμα μας δραστηριοποιούνται στον κλάδο των τροφίμων-ποτών, το 31,0% στον κλάδο του τουρισμού, το 15,0% στον κλάδο της γεωργίας-κτηνοτροφίας, το 4,8% στον κατασκευαστικό κλάδο και το 2,7% στον κλάδο των logistics-συσκευασίας.

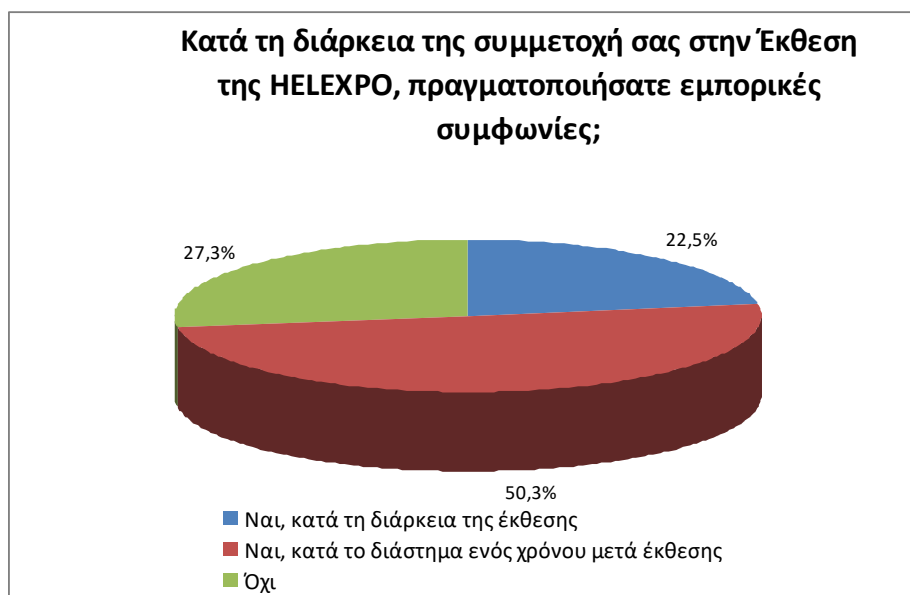
Τέλος το μέγεθος των επιχειρήσεων που εκπροσωπούνται στο δείγμα μας αποτυπώνεται στον ετήσιο κύκλο εργασιών τους. Έτσι όπως προκύπτει από αυτό, η πλειοψηφία των επιχειρήσεων του δείγματός μας είναι αρκετά μεγάλες επιχειρήσεις με σημαντικό κύκλο εργασιών. Ειδικότερα το 34,2% των επιχειρήσεων έχουν κύκλο 1-5 εκατ. €, το 33,2% έχουν κύκλο μέχρι 1 εκατ. €, το 13,9% έχει κύκλο 20-30 εκατ. €, το 11,2% έχει κύκλο 5-10 εκατ. € και το 7,5% έχει κύκλο 10-20 εκατ. €.

4.3. Αποτελέσματα Έρευνας

Αρχικά αναλύονται τα αποτελέσματα της έρευνάς μας που έχουν να κάνουν με το Πρόγραμμα Hosted Buyers και την συμμετοχή των συμμετεχόντων σε αυτό. Η επίσκεψη των συμμετεχόντων στην έκθεση της HELEXPO κρίνεται από την πλειοψηφία των ερωτώμενων θετικά. Συγκριμένα το 47,6% αξιολογεί την επίσκεψή του στην έκθεση ως καλή και το 37,4% ως πολύ καλή, ενώ αντίθετα αρνητικά την κρίνει μόλις το 1,1%. Στο ίδιο κλίμα είναι και η αξιολόγηση των B2B συναντήσεων που πραγματοποιήθηκαν κατά τη διάρκεια της έκθεσης, καθώς το 43,3% αξιολογεί τις συναντήσεις

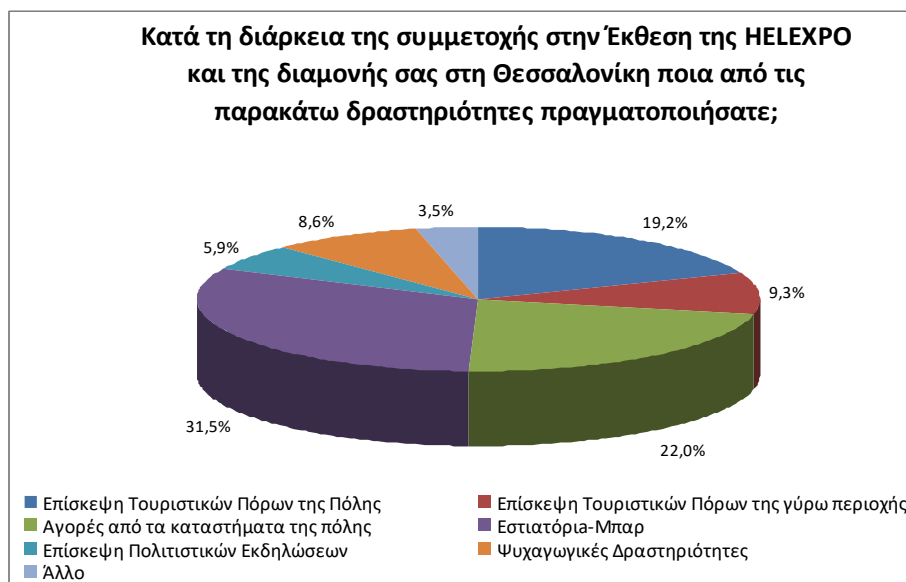
θετικά και το 39,6% πολύ θετικά. Εδώ το ποσοστό των συμμετεχόντων στην έρευνα που αξιολογούν αρνητικά τις συναντήσεις είναι ελαφρώς πιο αυξημένο από την προηγούμενη περίπτωση (4,3%).

Στο πλαίσιο των συναντήσεων αυτών, το 50,3% των ερωτώμενων ανέφερε ότι πραγματοποίησε το διάστημα που ακολούθησε την έκθεση εμπορικές συμφωνίες με τις επιχειρήσεις που συνάντησε στην έκθεση στην οποία συμμετείχε, το 22,5% ανέφερε ότι εμπορικές συμφωνίες πραγματοποίησε κατά τη διάρκεια της έκθεσης, ενώ μόνο το 27,3% ανέφερε ότι δεν πραγματοποίησε συμφωνίες με κάποιον από αυτούς που συνάντησε στην έκθεση. Από τις απαντήσεις αυτές φαίνεται καθαρά το σημαντικό αποτέλεσμα του προγράμματος Hosted Buyers σε εμπορικό επίπεδο, καθώς προωθεί τις εμπορικές συμφωνίες και σε κάποιο βαθμό και τις εξαγωγές.



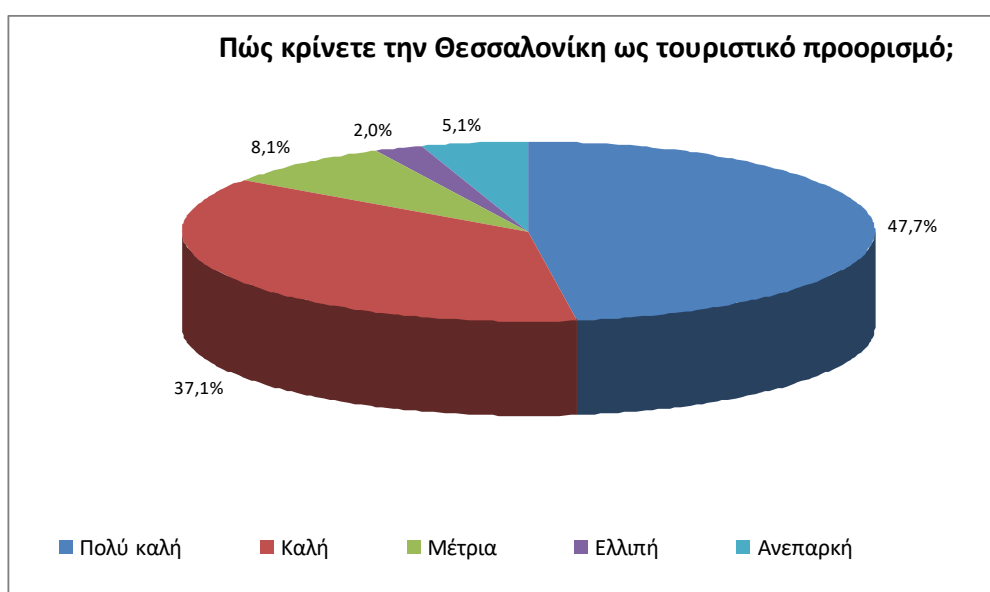
Διάγραμμα 4. Σύναψη Εμπορικών Συμφωνιών κατά τη διάρκεια συμμετοχής στην Έκθεση της HELEXPO

Στη συνέχεια αναλύονται τα αποτελέσματα της έρευνάς μας που έχουν να κάνουν με την επίσκεψη των συμμετεχόντων στην έρευνά μας στο Πρόγραμμα Hosted Buyers της ΔΕΘ-HELEXPO. Κατά τη διάρκεια της συμμετοχής στην έκθεση της HELEXPO και της διαμονής των επισκεπτών στη Θεσσαλονίκη οι προσκεκλημένοι πραγματοποιούν ποικίλες δραστηριότητες που δεν συνδέονται άμεσα με την έκθεση και έχουν περισσότερο τουριστικό και ψυχαγωγικό χαρακτήρα (διάγραμμα 5.). Ειδικότερα το 31,5% των συμμετεχόντων στην έρευνα αναφέρει ότι κατά την επίσκεψή του στη Θεσσαλονίκη επισκέφθηκε τα εστιατόρια - μπαρ της πόλης, το 22,0% αναφέρει ότι πραγματοποίησε αγορές από τα καταστήματα της πόλης, το 19,2% αναφέρει ότι επισκέφθηκε τους τουριστικούς πόρους της πόλης και το 9,3%, αναφέρει ότι επισκέφθηκε τους τουριστικούς πόρους της γύρω περιοχής.



Διάγραμμα 5. Δραστηριότητες που πραγματοποιούν οι Hosted Buyers κατά τη διάρκεια της συμμετοχής τους στην Έκθεση της HELEXPO και της διαμονής τους στη Θεσσαλονίκη

Επιπλέον η αξιολόγηση της πόλης της Θεσσαλονίκης ως τουριστικός προορισμός από τους συμμετέχοντες στην έρευνά μας είναι ιδιαίτερα θετική. Πιο συγκεκριμένα το 47,7% κρίνει τη Θεσσαλονίκη ως πολύ καλό τουριστικό προορισμό, το 37,1% ως καλό και το 8,1% ως μέτριο, αντίθετα αρνητική αξιολόγηση δίνει μόνο το 7,1% (διάγραμμα 6.).

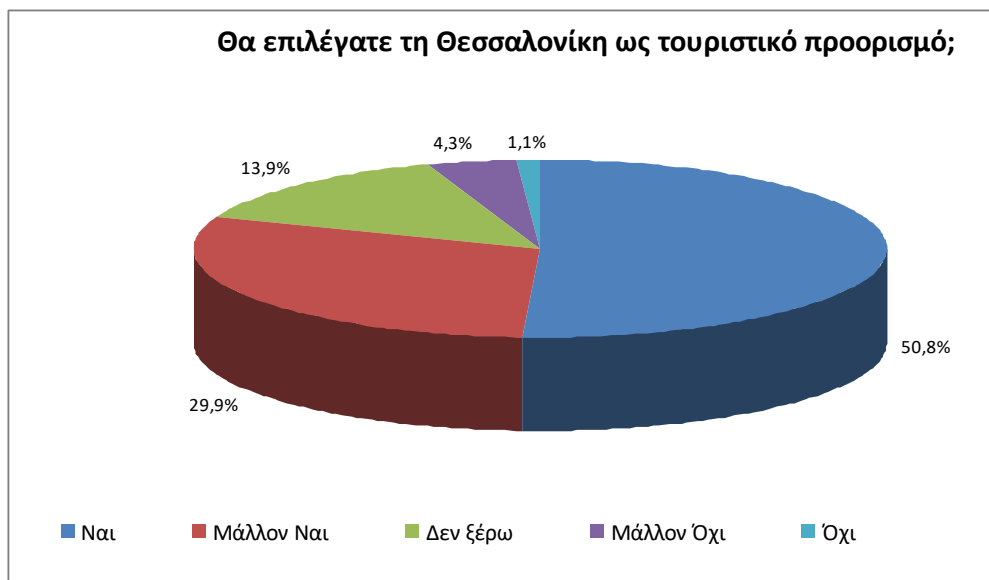


Διάγραμμα 6. Αξιολόγηση της Θεσσαλονίκης ως Τουριστικό Προορισμό

Από όλες τις απαντήσεις που δόθηκαν στις προηγούμενες ερωτήσεις από τους συμμετέχοντες στην έρευνά μας είναι φανερό ότι το πρόγραμμα hosted buyers της HELEXPO, εκτός από τον καθαρά οικονομικό και εμπορικό αντίκτυπο που έχει στις επιχειρήσεις που συμμετέχουν στις εκθέσεις, έχει ταυτόχρονα σημαντικό τουριστικό αντίκτυπο για την πόλη της Θεσσαλονίκης, αλλά και για την ευρύτερη περιοχή.

Τέλος αναλύονται τα αποτελέσματα της έρευνάς μας που έχουν να κάνουν με τις απόψεις και τις αντιλήψεις των συμμετεχόντων στην έρευνα για την πόλη της Θεσσαλονίκης, όπως αυτές

διαμορφώθηκαν μετά την πρόσφατη επίσκεψή τους στην Θεσσαλονίκη, στο πλαίσιο του Προγράμματος Hosted Buyers της ΔΕΘ-HELEXPO. Οι συμμετέχοντες στην έρευνά μας αναφέρουν στην συντριπτική τους πλειοψηφία ότι θα επιλέγανε τη Θεσσαλονίκη ως τουριστικό προορισμό (διάγραμμα 7.). Συγκεκριμένα το 50,8% των ερωτώμενων αναφέρει ότι θα επέλεγε τη Θεσσαλονίκη ως τουριστικό προορισμό, το 29,9% αναφέρει ότι μάλλον θα την επέλεγε, ενώ το 13,9% δεν εκφέρει άποψη (δεν ξέρω). Αντίθετα αρνητικό στο ενδεχόμενη επιλογή της Θεσσαλονίκης ως τουριστικό προορισμό δηλώνει μόλις το 5,4% των ερωτώμενων.



Διάγραμμα 7. Επιλογή της Θεσσαλονίκης ως Τουριστικό Προορισμό

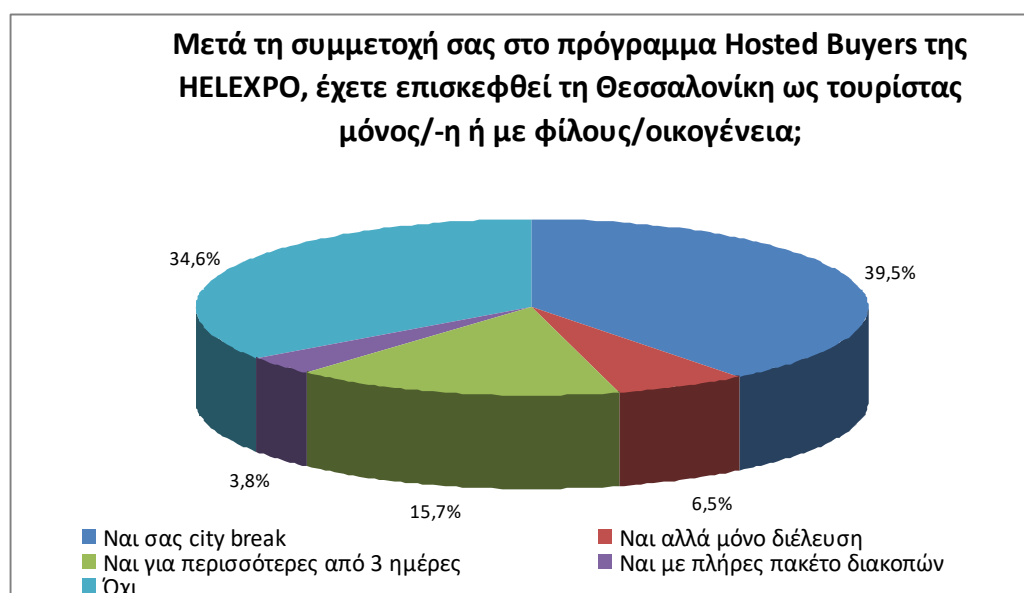
Επιπλέον ακόμα πιο θετικοί εμφανίζονται οι συμμετέχοντες στην έρευνά μας στο να προτείνουν τη Θεσσαλονίκη ως τουριστικό προορισμό σε φίλους και συγγενείς. Ειδικότερα το 59,4% των ερωτώμενων αναφέρει ότι θα πρότεινε τη Θεσσαλονίκη ως τουριστικό προορισμό στο κύκλο του, το 27,3% δηλώνει ότι μάλλον θα την πρότεινε και το 9,6% δεν εκφέρει γνώμη, ενώ μόλις το 3,8% φαίνεται αρνητικό σε ένα τέτοιο ενδεχόμενο (διάγραμμα 8.).

Ακόμα οι ερωτώμενοι που συμμετείχαν στην έρευνά μας σε ποσοστό 65,4% επισκέφθηκαν τη Θεσσαλονίκη ως τουρίστες μετά τη συμμετοχή τους στο πρόγραμμα Hosted Buyers της HELEXPO, έναντι 34,6% που δεν επισκέφθηκαν ξανά τη Θεσσαλονίκη. Από τους ερωτώμενους που επισκέφθηκαν τη Θεσσαλονίκη ως τουρίστες, το 39,5% επισκέφθηκε την πόλη ως city break, το 15,7% διέμεινε στην πόλη για περισσότερες από 3 ημέρες, το 6,5% είχε τη Θεσσαλονίκη μόνο ως διέλευση και το 3,8% με πλήρες πακέτο διακοπών (διάγραμμα 9.).

Από τις απαντήσεις που δόθηκαν στις προηγούμενες ερωτήσεις από τους συμμετέχοντες στην έρευνά μας προκύπτει ότι το πρόγραμμα hosted buyers της HELEXPO εκτός από τον μετρίσιμο αντίκτυπο που εμφανίζει στον τουρισμό της πόλης της Θεσσαλονίκης έχει και ποιοτική τουριστική επίδραση, καθώς δημιουργούνται τουριστικές δυναμικές για την πόλη και την ευρύτερη περιοχή, καθιστώντας την γνωστή ως τουριστικό προορισμό.



Διάγραμμα 8. Πρόταση της Θεσσαλονίκης ως Τουριστικό Προορισμό σε Φίλους και Συγγενείς



Διάγραμμα 9. Επανάληψη της Επίσκεψης στη Θεσσαλονίκη ως Τουρίστας μετά το Πρόγραμμα Hosted Buyers

5. ΣΥΜΠΕΡΑΣΜΑΤΑ

Με βάση την κεντρική υπόθεση εργασίας, η οποία αφορά τη διερεύνηση της τουριστικής διάστασης του προγράμματος Φιλοξενίας Ξένων Εμπορικών Επισκεπτών (Hosted Buyers Program) της ΔΕΘ-HELEXPO, αναδείξαμε τη σημαντική τουριστική συμβολή του προγράμματος για την πόλη και την ευρύτερη περιοχή. Βέβαια, όπως αναφέρθηκε και προηγουμένως, η ενίσχυση του τουρισμού δεν αποτελεί το βασικό στόχο του προγράμματος, ο οποίος είναι η ενίσχυση της εξωστρέφειας των επιχειρήσεων και εν γένει την ανάπτυξη τους. Παρόλα αυτά όμως οι προσκεκλημένοι στις εμπορικές εκθέσεις μπορεί να επισκέπτονται τη Θεσσαλονίκη για εμπορικούς λόγους, όμως γνωρίζουν την πόλη και με τον τρόπο αυτό αναπτύσσονται τουριστικές δυναμικές για την πόλη.

Αρχικά και μελετώντας τη διεθνή βιβλιογραφία, διαπιστώνουμε ότι οι εμπορικές εκθέσεις έχουν γενικότερα σημαντική συμβολή στο τουρισμό των περιοχών που τις φιλοξενούν. Η συμβολή αυτή έρχεται ως έμμεσο αποτέλεσμα της εκθεσιακής δραστηριότητας, καθώς μπορεί να μην αποτελεί

βασική της στόχευση, όμως λόγω της προσέλκυσης μεγάλου αριθμού επισκεπτών ενισχύει τον τουρισμό.

Στην συνέχεια στην παρούσα εργασία επικεντρωθήκαμε στην περίπτωση της Θεσσαλονίκης, όπου η ιστορία της έκθεσης εξελίσσεται παράλληλα με την ιστορία της πόλης. Ειδικότερα η Διεθνής Έκθεση Θεσσαλονίκης, στα 90 χρόνια ιστορίας της, διαρκώς παρουσίαζε σημαντική αλληλεπίδραση με την πόλη σε πολλά επίπεδα μεταξύ αυτών και στον τουρισμό. Στο πλαίσιο αυτό η ΔΕΘ-HELEXPO για να καταστεί ανταγωνιστική σε διεθνές περιβάλλον και για να ανταποκριθεί στις σύγχρονες ανάγκες των επιχειρήσεων, υλοποιεί οργανωμένο Πρόγραμμα Φιλοξενίας Ξένων Εμπορικών Επισκεπτών στις κλαδικές της εκθέσεις.

Για να διερευνήσουμε την τουριστική συμβολή του προγράμματος αυτού, πραγματοποιήσαμε πρωτογενή έρευνα στους προσκεκλημένους εμπορικούς επισκέπτες που επισκέφθηκαν τη Θεσσαλονίκη και τις εκθέσεις της ΔΕΘ-HELEXPO την περίοδο 2014-2016. Μέσα από την έρευνα αυτή προέκυψε ότι το πρόγραμμα hosted buyers, εκτός από τον καθαρά οικονομικό και εμπορικό αντίκτυπο που έχει στις επιχειρήσεις που συμμετέχουν στις εκθέσεις, έχει ταυτόχρονα σημαντικό τουριστικό αντίκτυπο για την πόλη της Θεσσαλονίκης, αλλά και για την ευρύτερη περιοχή. Μάλιστα αυτό που αναδείχθηκε δευτερογενώς από την έρευνα μας, είναι το γεγονός ότι το πρόγραμμα έχει ποιοτική τουριστική επίδραση, που δεν είναι άμεσα μετρίσιμη, καθώς είναι σε επίπεδο δυναμικών και προοπτικών ενίσχυσης του τουρισμού.

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Μνημόνια και Συλλογικές Διαπραγματεύσεις: το διακύβευμα και οι συνέπειες της αποκέντρωσης

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Περίληψη

Στην παρούσα ανακοίνωση θα διαπραγματευτούμε το θέμα των επιπτώσεων των τριών Μνημονίων που υπέγραψε η Ελλάδα με τους πιστωτές της στο εθνικό σύστημα εργασιακών σχέσεων και ιδίως στις συλλογικές διαπραγματεύσεις.

Αρχικά θα αναπτυχθεί σύντομα το σχετικό θεωρητικό πλαίσιο και οι μεταρρυθμίσεις που συνέβησαν στο θεσμικό πλέγμα των συλλογικών διαπραγματεύσεων την τελευταία δετία.

Στη συνέχεια θα επιχειρηθεί η συστηματική ανάλυση των τάσεων στο πεδίο των συλλογικών διαπραγματεύσεων από την υπογραφή του πρώτου Μνημονίου μέχρι σήμερα, με τη χρήση ποσοτικών δεδομένων του Υπουργείου Εργασίας και του ΟΜΕΔ.

Τέλος, θα αναδειχτούν οι συνέπειες από την εφαρμογή των μέτρων αυτών στο σύστημα των εργασιακών σχέσεων και τις συλλογικές διαπραγματεύσεις υπό το πρίσμα των θεωρητικών προσεγγίσεων της κοινωνικής εταιρικότητας.

Στα συμπεράσματα της εργασίας θα συζητηθούν οι αιτίες που οδήγησαν στη ραγδαία αποκέντρωση των συλλογικών διαπραγματεύσεων και οι συνέπειες αυτής της εξέλιξης.

Λέξεις κλειδιά: Μνημόνιο, Εργασιακές Σχέσεις, Συλλογικές Διαπραγματεύσεις.

1. Εισαγωγικά

Πριν από την μη αναμενόμενη κρίση του 2008 (Koutsoukis and Roukanas, 2011, Βενιέρης, 2011) οι εργασιακές σχέσεις στην Ελλάδα ήταν αρκετά συγκεντρωτικές (Ιωάννου, 2011), με υψηλό επίπεδο ρύθμισης τόσο στις ατομικές, όσο και τις συλλογικές σχέσεις απασχόλησης (Koukiadaki and Kretsos, 2012). Τον Μάιο του 2010 ανακοινώθηκε η συμφωνία της χώρας να ενταχθεί στον μηχανισμό χρηματοοικονομικής στήριξης και υπογράφηκε το πρώτο Μνημόνιο, που συνοδεύτηκε από ένα αυστηρό πρόγραμμα δημοσιονομικής προσαρμογής (Κυριακουλίας, 2012). Η εφαρμογή των μέτρων των Μνημονίων 1, 2 και 3 είχε παράπλευρες συνέπειες και στο πεδίο του κοινωνικού διαλόγου.

2. Μνημόνια και Εργατική Πολιτική

Τα Μνημόνια περιείχαν μέτρα για την εξυγίανση των δημόσιων οικονομικών, τη ρύθμιση και εποπτεία του χρηματοπιστωτικού τομέα, την εφαρμογή διαρθρωτικών μεταρρυθμίσεων που θα βελτίωναν την ανταγωνιστικότητά. Επιπλέον, συμπεριλήφθηκαν μέτρα παρέμβασης στην αγορά εργασίας, το θεσμικό πλαίσιο των σχέσεων απασχόλησης και τους μηχανισμούς κοινωνικού

διαλόγου σε ποικίλα επίπεδα (Κυριακούλιας, 2012). Ειδικά για τον κοινωνικό διάλογο η μετατόπιση του κέντρου βάρους των συλλογικών διαπραγματεύσεων από τον κλάδο/ το επάγγελμα στην επιχείρηση σηματοδότησε τον ριζικό αναπροσανατολισμό του συστήματος συλλογικών διαπραγματεύσεων στη χώρα μας, μετά από περίπου μια 20ετία (Κυριακούλιας, 2012). Οι κύριες παρεμβάσεις στην αγορά εργασίας προώθησαν την ευελιξία της εργασίας διαμέσου της διευκόλυνσης των απολύσεων και προσλήψεων και της μείωσης του κόστους αυτών, της διάδοσης των ευέλικτων μορφών εργασίας (προσωρινή και μερική απασχόληση, δανεισμός εργαζομένων, απασχόληση με τη μορφή «παροχής ανεξάρτητων υπηρεσιών», τηλεργασία), της διευθέτησης του χρόνου εργασίας (υπολογισμός εργάσιμου χρόνου σε ετήσια βάση, περιορισμός υπερωριών) και της ευελιξίας αμοιβών (μείωση των κατώτατων μισθών, αποκέντρωση συλλογικών διαπραγματεύσεων).

Τα Μνημόνια δρομολόγησαν ριζικές ανατροπές στο πλαίσιο προσδιορισμού των όρων αμοιβής και εργασίας των εργαζομένων στον ιδιωτικό τομέα (δυνατότητα απόκλισης των όρων μεταξύ των ΣΣΕ ως προς την αρχή της ευνοϊκότερης ρύθμισης, απαγόρευση χορήγησης αυξήσεων πέραν εκείνων της ΕΓΣΣΕ, αλλαγές στη διαδικασία και το περιεχόμενο των θεσμών Μεσολάβησης και Διαιτησίας, ενίσχυση του θεσμού της Συμφιλίωσης). Με αυτόν τον τρόπο προωθήθηκε η αποκέντρωσή της συλλογικής διαπραγμάτευσης από το επίπεδο του κλάδου/επαγγέλματος προς το επίπεδο της επιχείρησης (Ιωάννου, 2011), αλλά και περαιτέρω προς την ατομική διαπραγμάτευσή εργοδότη-εργαζόμενου (Κυριακούλιας, 2012).

Τα ειδικότερα μέτρα της εργατικής πολιτικής των Μνημονίων για τις συλλογικές σχέσεις εργασίας αποτυπώνονται στον πίνακα 1.

Πίνακας 1: Μέτρα Μνημονίων για συλλογικές σχέσεις εργασίας

Απόκλιση όρων συλλογικών συμβάσεων (Ν. 3845/10)
α) Εκπροσώπηση εργοδοτών στον κλάδο των Τραπεζών, (β) Ηλεκτρονικό Μητρώο Συλλογικών Ρυθμίσεων (Ν. 3846/10)
Απαγόρευση μισθολογικών αυξήσεων (Ν. 3871/10)
(α) Μεσολάβηση και Διαιτησία, (β) Λειτουργία του Οργανισμού Μεσολάβησης και Διαιτησίας (ΟΜΕΔ)
Θεσμοθέτηση ειδικών επιχειρησιακών ΣΣΕ
(α) Κατάργηση ειδικών επιχειρησιακών ΣΣΕ, (β) ΣΣΕ με ενώσεις προσώπων, (γ) Υπερίσχυση επιχειρησιακών ΣΣΕ, (δ) Συρροή, επέκταση, κατάργηση και αναστολή διατάξεων Ν. 1876/90 (Ν. 4024/11)
Συμφιλίωση Ν. (3996/11)
Κατίσχυση νομοθετικών διατάξεων έναντι ΣΣΕ στον ευρύτερο Δημόσιο Τομέα
(α) Μείωση κατώτατων μισθών ΕΓΣΣΕ, (β) Διάρκεια, παράταση, μετενέργεια ΣΣΕ, (γ) Πάγωμα αυξήσεων και ωριμάνσεων, (δ) Κατάργηση μονιμότητας σε ΔΕΚΟ, (ε) Κατάργηση μονομερούς προσφυγής στη Διαιτησία (Ν. 4046/12, ΠΥΣ Αριθμ. 6/29-2-2012)

Μισθολογικές περικοπές (αναμένεται η ολοκλήρωση τους)
Νομοσχέδιο για τις Εργασιακές Σχέσεις (αναμένεται)
Νομοσχέδιο για τις Συλλογικές Διαπραγματεύσεις (αναμένεται)

Πηγή: Επεξεργασία από Κυριακουλίας, 2012, Κουζής, 2015 και ΟΜΕΔ, 2012α.

3. Η δυναμική του κοινωνικού διαλόγου πριν το Μνημόνιο

Με τον όρο κοινωνικό διάλογο (ΚΔ) εννοούμε την «προσπάθεια επικοινωνίας και συνεννόησης κοινωνικών ομάδων διαφορετικών συμφερόντων, για την επίλυση προβλημάτων που τους αφορούν ή για την αναζήτηση, ανάδειξη ή και κατάκτηση κοινών στόχων ή απλώς για ανταλλαγή απόψεων μεταξύ τους» (ΟΚΕ, 1999).

Η αναγκαιότητα εγκαθίδρυσης και ενεργοποίησης διαδικασιών κοινωνικής εταιρικής/κοινωνικού διαλόγου έχει διεθνώς αναγνωριστεί ως απαραίτητη προϋπόθεση για την πληρέστερη επιτυχία της οικονομικής και κοινωνικής πολιτικής (Koutroukis and Kretsos, 2004, 2008).

Μια διαδικασία κοινωνικού διαλόγου στην Ελλάδα ξεκίνησε τη δεκαετία του 1990 όταν η κυβέρνηση δεσμεύτηκε να συζητά με τους κοινωνικούς εταίρους πριν να αναλάβει νομοθετικές πρωτοβουλίες για την οικονομική και κοινωνική πολιτική (ΟΚΕ, 2002).

Μετά το 1990 ο ρόλος των κοινωνικών εταίρων σταδιακά άλλαξε και το νέο πλαίσιο χαρακτηρίστηκε από το μειωμένο ρόλο του κράτους στις εργασιακές σχέσεις, την επικράτηση ενός συστήματος ελεύθερων συλλογικών διαπραγματεύσεων και εθελοντική διευθέτηση των εργασιακών διαφορών. Η Ελλάδα στις αρχές του 21ου αιώνα ανήκε στις χώρες της Ε.Ε., στις οποίες που η διεθνής τάση για αποκέντρωση των μισθολογικών διαπραγματεύσεων είχε προσκρούσει στο πλαίσιο κεντρικής ρύθμισης των αμοιβών της εργασίας (Lavdas, 2007). Αυτή η συγκεντρωτική διαπραγμάτευση έπαιζε ένα κομβικό ρόλο στον καθορισμό των μισθών σε κλαδικό, επιχειρησιακό και τοπικό επίπεδο (Ιωάννου, 2011, Lavdas, 2007).

Ειδικά στη χώρα μας, παρά τη σχετικά επιτυχή λειτουργία της ΟΚΕ τα τελευταία χρόνια πριν τη χρηματοπιστωτική κρίση του 2008, οι αντικειμενικές προϋποθέσεις για την αποτελεσματική λειτουργία του κοινωνικού διαλόγου εκπληρώθηκαν σε μικρό βαθμό (Vogiatzoglou, 2014, Κουζής, 2015, Ζαμπαρλούκου, 2014), με συνέπεια την μερική αποτελεσματικότητα των περισσότερων θεσμών κοινωνικού διαλόγου (Κουτρούκης, 2004).

4. Το θνησιγενές εγχείρημα του κοινωνικού διαλόγου μετά το Μνημόνιο

4.1.Ο διάλογος σε μακροοικονομικό επίπεδο

Μετά το Μνημόνιο Ι η κυβέρνηση επιχείρησε να δρομολογήσει έναν υποτυπώδη κοινωνικό διάλογο για θέματα οικονομικής, κοινωνικής κι εργατικής πολιτικής, αλλά η ΓΣΕΕ αρνήθηκε να συμμετάσχει (Patra, 2012). Μολονότι, η πρόβλεψη για διαβούλευση με τους κοινωνικούς εταίρους πριν την οριστικοποίηση των μέτρων εργατικής πολιτικής προβλέφθηκε στο Μνημόνιο, τα εργατικά συνδικάτα απέφυγαν να συμμετέχουν, πεπεισμένα ίσως ότι οι διαβουλεύσεις θα γινόταν επι ματαίω.

Ο πιο σημαντικός θεσμός κοινωνικού διαλόγου Οικονομική και Κοινωνική Επιτροπή (ΟΚΕ) ελάχιστα συμμετείχε σε διαδικασίες κοινωνικού διαλόγου καθώς οι περισσότερες νομοθετικές πρωτοβουλίες για την αγορά εργασίας θεσπίστηκαν με τη διαδικασία του κατεπείγοντος (Lanara-Tzotze, 2013). Ούτως ή άλλως, οι περισσότερες επίσημες ή άτυπες προτάσεις των κοινωνικών εταίρων απορρίφθηκαν από την των Πιστωτών (Patra, 2012). Στις ad hoc διμερείς διαπραγματεύσεις εργοδοτικών κι εργατικών οργανώσεων (ΓΣΕΕ, ΣΕΒ, ΓΣΕΒΕΕ, ΕΣΕΕ) δεν προέκυψαν πορίσματα, που ήταν πιθανό να αποδεχτεί το Υπουργείο Εργασίας (Patra, 2012). Ωστόσο, στις 15-7-2010 οι εργοδοτικές και εργατικές οργανώσεις υπέγραψαν την Εθνική Γενική Συλλογική Σύμβαση Εργασίας (ΕΓΣΣΕ) 2010-2012. Στις 14-05-2013 συνομολογήθηκε η ΕΓΣΣΕ για το 2013 που στα κύρια σημεία της προβλέπει ότι δεν μεταβάλλονται οι μισθοί, διατηρείται το επίδομα γάμου, ενώ παράμειναν σε ισχύ οι θεσμικοί όροι προηγούμενων συμβάσεων. Ανάλογες ΕΓΣΣΕ υπογράφηκαν για το 2014 (Π.Κ. 3/26-03-2014), που στη συνέχεια παρατάθηκε και για το 2015.

Ακόμη και στο Τρίτο Μνημόνιο, οι συνθήκες συνομολόγησης του το καλοκαίρι του 2015 έγιναν με μια «διαδικασία του επείγοντος», επομένως, ο χρόνος και ο χώρος για να διεξαχθεί κάποιο είδος κοινωνικού διαλόγου ήταν εξαιρετικά περιορισμένος (Ζαμπαρλούκου, 2014).

4.2. Το νέο τοπίο των συλλογικών διαπραγματεύσεων: ορισμένα στοιχεία

Τα Μνημόνια επέφεραν σαρωτικές αλλαγές στο πεδίο των συλλογικών διαπραγματεύσεων. Σε μια μελέτη των Ιωάννου και Παπαδημητρίου (2013) αποτυπώνεται μια σημαντική υποχώρηση των κλαδικών και ομοιοεπαγγελματικών ΣΣΕ προς όφελος των επιχειρησιακών (πίνακας 2)

Ιδιαίτερα αισθητή είναι και η τάση για αποκέντρωση των συλλογικών διαπραγματεύσεων, ενώ από το 2012 και μέχρι το 2014 δεν εκδόθηκαν διαιτητικές αποφάσεις.

Την περίοδο 2011-2014 διαπιστώνεται ο περιορισμός του αριθμού των κλαδικών και ομοιοεπαγγελματικών ΣΣΕ (κυρίως λόγω της προσωρινής άρσης του δικαιώματος μονομερούς προσφυγής στη διαιτησία) και ο πολλαπλασιασμός των επιχειρησιακών ΣΣΕ. Την ίδια χρονική περίοδο είναι εξαιρετικά χαμηλός ο βαθμός κάλυψης της αγοράς εργασίας από ΣΣΕ. Ακόμη υφίσταται ραγδαία υποχώρηση ή/και κατάρρευση των διεπιχειρησιακών ΣΣΕ δηλ. των κατά μ.ο. 100 κλαδικών και 90

ομοιοεπαγγελματικών που ρύθμιζαν τους όρους αμοιβής κι εργασίας σε ευρύτατους παραγωγικούς τομείς (Ιωάννου, 2015).

Στο τέλος του 2015 ούτε το 10% των ρυθμίσεων μέσω ΣΣΕ δεν ίσχυε κι αυτές ελάχιστα επηρέαζαν (σταθεροί ή μειωμένοι μισθοί αλλά ισχύς θεσμικών όρων). Ακόμη διαπιστώθηκε πολλαπλασιασμός των επιχειρησιακών ΣΣΕ έναντι των παρελθόντων ετών (Ιωάννου, 2015), τάση που, ωστόσο, επιβραδύνθηκε -ως τάση αποκέντρωσης των ΣΣΕ- πέραν ορισμένου σημείου (την περίοδο 2012-2015 μειώθηκαν οι αποδοχές έως και 15% και σχεδόν ολοκληρώθηκε η αναπροσαρμογή τους στην ΕΓΣΣΕ)

Οι ενώσεις προσώπων ήταν το εργαλείο, το οποίο χρησιμοποιήθηκε για να επιτευχθεί η απόκλιση από τις κλαδικές ΣΣΕ. Το 2012 είχαν συνομολογηθεί 976 επιχειρησιακές ΣΣΕ (83,4% με Ενώσεις Προσώπων, 5,1% με επιχειρησιακά σωματεία και 11% με πρωτοβάθμια κλαδικά τοπικά σωματεία). Τέλος, με τις επιχειρησιακές ΣΣΕ αποκεντρώθηκαν οι ΣΣΕ σε όλη τη χώρα, ενώ η καταγγελία των ΣΣΕ γίνεται πλέον κυρίως από την εργοδοτική πλευρά (Ιωάννου και Παπαδημητρίου 2013). Μετά την επικαιροποίηση του θεσμικού πλαισίου για την διαιτησία στις συλλογικές εργασιακές διαφορές

το φθινόπωρο του 2014, τα αρμόδια διαιτητικά όργανα του ΟΜΕΔ (Διαιτητές, 3μελείς επιτροπές Διαιτησίας, 5μελεις Επιτροπές Διαιτησίας) άρχισαν εκ νέου να εκδίδουν διαιτητικές αποφάσεις (Ιωάννου, 2015).

Η αδυναμία αναπαραγωγής κλαδικών/ομοιοπαγγελματικών ΣΣΕ συνδέεται με (Ιωάννου, 2015) : α) διαπραγματευτικές ασυμφωνίες των μερών για τους μισθούς και παροχές β) θεσμικές αλλαγές της περιόδου 2012-14 (κατάργηση μονομερούς προσφυγής στην διαιτησία) γ) δομικά αίτια κατάρρευσης της οικονομίας (μεγάλη μείωση της απασχόλησης και του αριθμού επιχειρήσεων εξαιτίας της κρίσης).

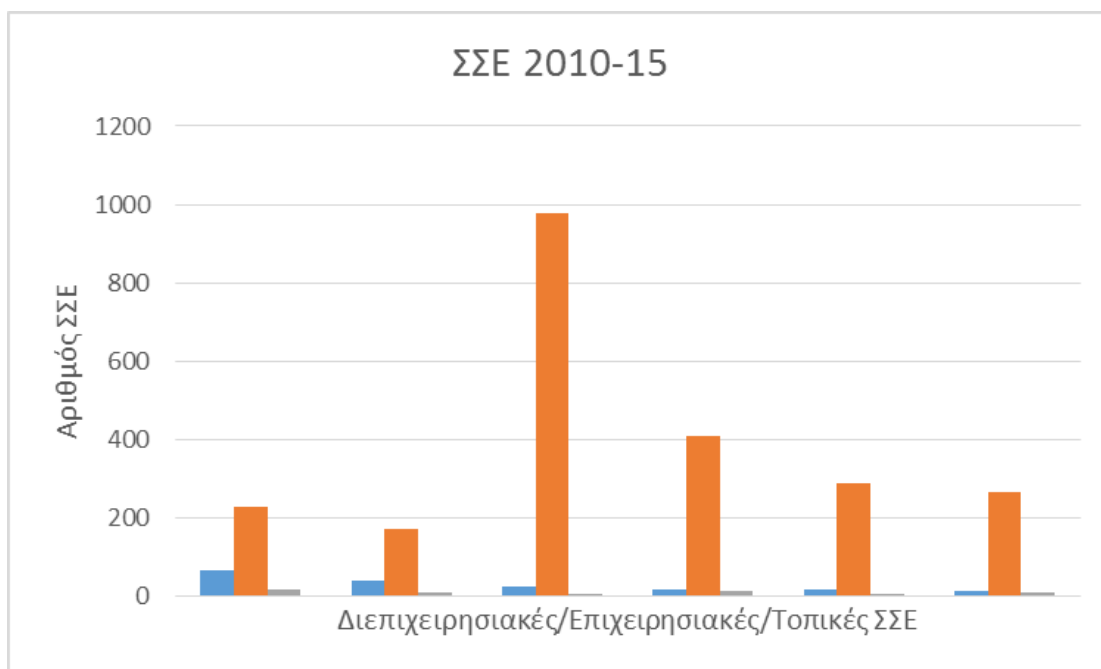
Πίνακας 2: Εξέλιξη μεριδίου των συλλογικών διαπραγματεύσεων κατά είδος και αποτέλεσμα 2008-2012

Έτος	Ομοιοεπαγγελματικές				Κλαδικές		Επιχειρησιακές		Σύνολο			Ποσοστό %	
	Εθνικές		Τοπικές										
	ΣΣΕ	ΔΑ	ΣΣΕ	ΔΑ	ΣΣΕ	ΔΑ	ΣΣΕ	ΔΑ	ΣΣΕ	ΔΑ	ΣΣΕ+ΔΑ	ΣΣΕ	ΔΑ
2008	43	17	27	2	117	25	215	15	403	59	462	87,2	12,8
2009	15	11	12	5	47	30	215	12	289	58	347	83,3	16,7
2010	33	8	14	6	31	21	227	11	306	46	352	86,9	13,1
2011	15	5	7	1	23	12	170	9	215	27	242	88,9	11,1
2012	4	1	6	4	19	7	975	-	1004	8	1012	99,2	0,8
2013	4	-	10	-	9	-	409	-	433	-	433	100	0,0
2014	3	-	5	-	10	2	286	-	305	2	307	99,3	0,7
2015	5	-	7	-	6	11	263	1	282	12	294	95,9	4,1

Πηγή: Επεξεργασία από ΟΜΕΔ 2012β,2013, 2014, 2015,2016

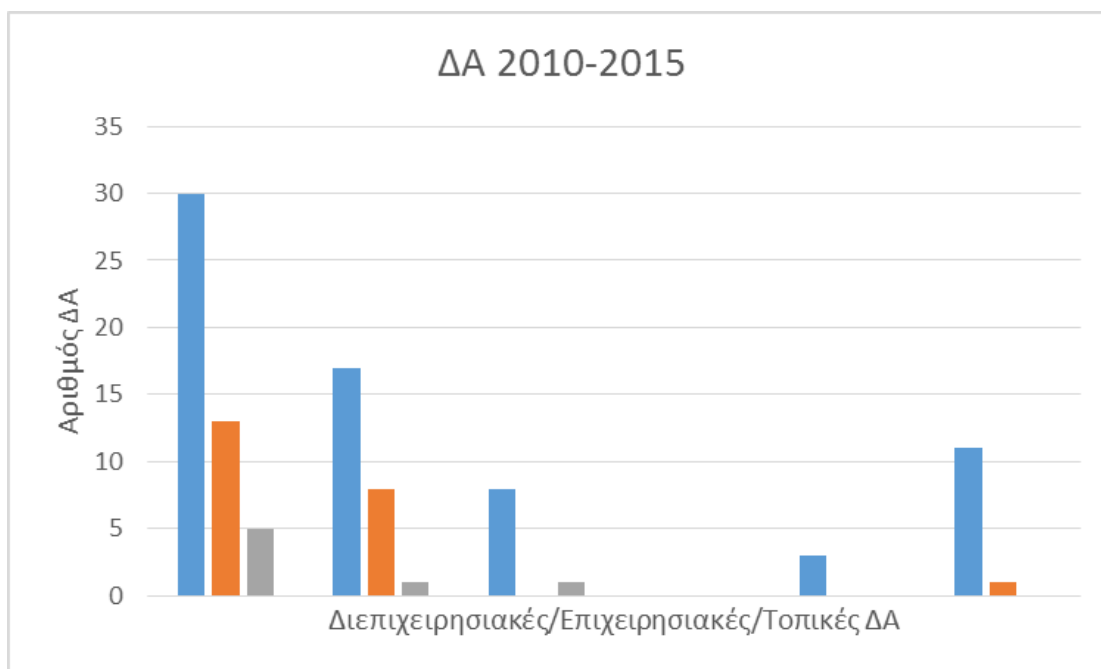
Στο γράφημα 1 απεικονίζεται η εξέλιξη του αριθμού των ΣΣΕ την περίοδο 2010-15, ενώ στο γράφημα 2 η εξέλιξη των διαιτητικών αποφάσεων την ίδια περίοδο.

Γράφημα 1: Οι συλλογικές συμβάσεις εργασίας την περίοδο 2010-15



Πηγή: Επεξεργασία από ΟΜΕΔ 2012β,2013, 2014, 2015,2016

Γράφημα 2: Οι Διαιτητικές Αποφάσεις την περίοδο 2010-15



Πηγή: Επεξεργασία από ΟΜΕΔ 2012β,2013, 2014, 2015,2016

5. Συμπεράσματα:

Την τελευταία εικοσαετία η χώρα μας βίωσε ένα ατελές πλην όμως αξιοσημείωτο εγχείρημα κοινωνικής εταιρικότητας (Vogiatzoglou, 2014). Κυρίως στα θέματα οικονομικής και κοινωνικής

πολιτικής, άρχισε να εμπεδώνεται μια κάποια κουλτούρα διαλόγου των κοινωνικών εταίρων, ενώ θεσμοί όπως η ΟΚΕ, ο ΟΜΕΔ, κ.λπ. ανέπτυξαν αξιόλογη δραστηριότητα. Η κατάσταση αυτή άλλαξε ριζικά τα τελευταία χρόνια υπό την επίδραση των Μνημονίων.

Το 2010 η ελληνική κυβέρνηση, αντιμετωπίζοντας ένα τεράστιο δημόσιο χρέος, ζήτησε οικονομική βοήθεια από την ΕΕ και το ΔΝΤ (Tsarouhas, 2012) και δεσμεύθηκε να υιοθετήσει μέτρα λιτότητας, μεταρρυθμίσεων στις αγορές και δημοσιονομικής πειθαρχίας, που ελέγχονται για πιθανολογούμενες παραβιάσεις του Συντάγματος και των Διεθνών Συμβάσεων Εργασίας (Βενιέρης, 2011, Κουζής 2015).

Επιχειρώντας να δικαιολογηθεί η κυβέρνηση ισχυρίστηκε -και αυτό ήταν εν μέρει ακριβές- ότι οι ασφυκτικές πιέσεις των αγορών δεν παρείχαν επαρκή χρόνο για να τεθούν οι συμφωνίες με τους πιστωτές μας σε διαδικασία κοινωνικής διαβούλευσης (Κυριακουλίας, 2012). Εθισμένο να λειτουργεί αποτελεσματικά σε έτη ευημερίας, το σύστημα συλλογικών διαπραγματεύσεων του νόμου 1876/90 βρέθηκε απροετοίμαστο για να συζητήσει εμβριθώς τα θέματα ανταγωνιστικότητας και εσωτερικής υποτίμησης που ανέδειξαν η οικονομική κρίση και η συμφωνία της χώρας για την ενεργοποίηση του μηχανισμού στήριξης (Ιωάννου, 2011, Ζαμπάρλουνγκου, 2014).

Στη νέα πραγματικότητα η τριμερής συνεργασία των κοινωνικών εταίρων παραμερίστηκε και η Τρόικα –αργότερα Κουαρτέτο- (συν)αποφάσισε με την κυβέρνηση μια σειρά από μέτρα αναφορικά με την προσαρμογή της αγοράς εργασίας.

Η εμφανής κυριαρχία της συνήθους προσέγγισης του ΔΝΤ στη χάραξη της οικονομικής και κοινωνικής πολιτικής παραμέρισε την κουλτούρα τριμερούς συνεργασίας της Ευρωπαϊκής Ένωσης και της Διεθνούς Οργάνωσης Εργασίας και συντέλεσε στην κατάρρευση των όποιων ερεισμάτων κοινωνικής εταιρικότητας (Koutroukis and Roukanas, 2016).

Οι μεταρρυθμίσεις στην αγορά εργασίας και το σύστημα συλλογικών διαπραγματεύσεων προωθήθηκαν δίχως ουσιαστικό κοινωνικό διάλογο, επιβεβαιώνοντας τον Hyman, που ισχυρίστηκε ότι στις χώρες όπου οι σχετικοί θεσμοί κοινωνικής εταιρικότητας δεν ήταν επαρκώς εδραιωμένοι, το κατεπείγον της κατάστασης διαχείρισης της κρίσης ελαχιστοποίησε τους λόγους για τη λειτουργία τους (2010).

Η νεόδομητη νομοθεσία και τα μέτρα λιτότητας δημιούργησαν ένα νέο περιβάλλον που επέδρασε καταλυτικά στην ανακατανομή της ισχύος και το ρόλο των πρωταγωνιστών του ελληνικού συστήματος εργασιακών σχέσεων.

Ελέω των Μνημονίων, ο κοινωνικός διάλογος και οι συλλογικές διαπραγματεύσεις περιθωριοποιήθηκαν, προς όφελος του μονολόγου των εκπροσώπων των Πιστωτών (Lanara-Tzotze, 2013). Η στρατηγική και οι πολιτικές που προωθήθηκαν από την κυβέρνηση ανταποκρίνονταν κυρίως στις επιταγές των Δανειστών και πολύ λιγότερο στη βούληση των κοινωνικών εταίρων, καθώς οι εργοδοτικές και ιδίως οι εργατικές ενώσεις διέθεταν περιορισμένες δυνατότητες παρέμβασης και συρρικνωμένη διαπραγματευτική ισχύ.

Το -μάλλον ζοφερό- μέλλον του κοινωνικού διαλόγου θα επηρεαστεί δραστικά από την εξασθένηση των συνδικαλιστικών οργανώσεων (λόγω της ραγδαίας μείωσης της συνδικαλιστικής πυκνότητας και της μισθωτής απασχόλησης στους προνομιακούς για τα εργατικά συνδικάτα τομείς, όπως οι τράπεζες) και την απώλεια της οικονομικής τους αυτονομίας (Koutroukis and Roukanas, 2016).

Επιπλέον, η υψηλή ανεργία και η διευρυνόμενη ευελιξία της εργασίας ούτως ή άλλως υποσκάπτουν την όποια απόπειρά των εργατικών συνδικάτων να στρατολογήσουν νέα μέλη στον ιδιωτικό τομέα. Σε αυτές τις συνθήκες φαίνεται πως η προθυμία των συνδικάτων να προβούν σε υποχωρήσεις έναντι της εργοδοσίας ελπίζοντας να περισώσουν θέσεις απασχόλησης έχει κατά πολύ αυξηθεί (Glasner and Keume, 2010).

Σε κάθε περίπτωση, η παγκοσμιοποίηση έχει προ πολλού επιτείνει την ανισορροπία ισχύος μεταξύ κεφαλαίου και εργασίας και σε συνδυασμό με την κρίση ελαχιστοποιεί την πιθανότητα για σύναψη συμφωνιών win-win (Hyman, 2010)

Στο νέο τοπίο της αγοράς εργασίας οι επιχειρήσεις δεν κινητροδοτούνται επαρκώς για να προσχωρήσουν στη φιλοσοφία της κοινωνικού διαλόγου, αντιθέτως μπορούν εύκολα να προσπαράσουν τις δι-επιχειρησιακές συλλογικές συμβάσεις και να ρυθμίσουν de facto (μονομερώς) τις αμοιβές και τις συνθήκες εργασίας (Koukiadaki and Kretsos, 2012, Patra, 2012). Επομένως, κυρίαρχο ρόλο στον καθορισμό των όρων αμοιβής κι εργασίας θα διαδραματίζει πλέον η αγορά κι όχι η κυβέρνηση ή οι κοινωνικοί εταίροι σε συλλογικό επίπεδο (Ζαμπαρλούκου, 2014).

Καθώς η διαπραγμάτευση των όρων εργασίας οδηγείται πλέον δυσκολότερα σε κάποιου είδους διαιτησία, φαίνεται πως οι μελλοντικές συνθήκες παροχής της μισθωτής εργασίας θα προσδιορίζονται κυρίως με επιχειρησιακές και ατομικές συμβάσεις σε μια αγορά εργασίας με αυξημένο βαθμό ευελιξίας. Η εναλλακτική συναινετική προσέγγιση της οικονομικής και κοινωνικής κρίσης θεωρήθηκε «πολυτέλεια» που θα καθυστερούσε την εφαρμογή των μέτρων κι εγκαταλείφθηκε ακριβώς τη στιγμή που θα μπορούσε να αποδώσει κάποια χειροπιαστά αποτελέσματα (Ζαμπαρλούκου, 2014, Lanara-Tzotze, 2013).

Συγκεφαλαιώνοντας, η διμερής ή τριμερής προσέγγιση στις μεταρρυθμίσεις έχει καταστεί κενό γράμμα. Αν οι προβλέψεις των Μνημονίων εκτελεστούν στο έπακρο, στο πεδίο της ελληνικής αγοράς εργασίας δε θα υπάρχει χώρος ούτε για κοινωνικό διάλογο, ούτε για υπερ-επιχειρησιακή συλλογική διαπραγμάτευση (Ιωάννου, 2015). Οι οργανισμοί που εκπροσωπούν τους πιστωτές και οι δυνάμεις της Αγοράς, με τις κυβερνήσεις να συμπαρατάσσονται ασμένως, φαίνεται πως θα παραμείνουν οι ισχυροί «εταίροι» στο ξεθωριασμένο ελληνικό όνειρο της κοινωνικής εταιρικότητας (Koutroukis and Roukanas, 2016).

Μεσομακροπρόθεσμα και δεδομένης της τρέχουσας ισορροπίας δυνάμεων κεφαλαίου-εργασίας, μια ρεαλιστική απάντηση στην κρίση θα ήταν η υιοθέτηση μιας «οργανωμένης αποκέντρωσης» του κοινωνικού διαλόγου, δηλαδή μιας διαδικασίας με την οποία οι υψηλότερου επιπέδου συμφωνίες θα θέτουν το πλαίσιο αρχών και κανόνων, εντός του οποίου θα διεξάγονται οι συλλογικές διαπραγματεύσεις στο αποκεντρωμένο επίπεδο (π.χ. τοπικά σύμφωνα απασχόλησης, επιχειρησιακές ΣΣΕ). Με αυτόν τον τρόπο θα γίνει εφικτός ο καθορισμός κάποιων ελάχιστων όρων αμοιβής κι εργασίας στο αποκεντρωμένο επίπεδο διαμέσου μιας διαδικασίας κοινωνικού διαλόγου (Glasner and Keume, 2010, Hyman, 2010) και θα αποφευχθεί η ανεξέλεγκτη ευελιξία και ο εξατομικευμένος καθορισμός των όρων της σύμβασης εργασίας, υπεράνω των οποιωνδήποτε εθνικών και κλαδικών ρυθμίσεων, αν αυτό είναι το επιθυμητό.

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Οι προσδιοριστικοί παράγοντες της φορολογικής συμμόρφωσης και η συμβολή του φορολογικού ελέγχου στην διαμόρφωσή της.

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Περίληψη

Αδιαμφισβήτητα η περιορισμένη φορολογική συμμόρφωση αποτελεί ένα διαχρονικό ζήτημα βαρύνουσας σημασίας για τις εθνικές οικονομίες. Προκειμένου να αντιμετωπιστεί κατά το δυνατόν επιτυχώς η εκτεταμένη φοροδιαφυγή θα πρέπει πρωτίστως να διερευνηθεί σε βάθος ποιοι είναι οι παράγοντες εκείνοι που προσδιορίζουν την φορολογική συμμόρφωση και πως αυτοί αλληλεπιδρούν και επηρεάζουν την διαμόρφωση της φορολογικής συμπεριφοράς των φορολογουμένων. Όπως προκύπτει από την ανασκόπηση του θεωρητικού πλαισίου ως βασικοί προσδιοριστικοί παράγοντες αναδεικνύονται οι πιθανότητες εντοπισμού, το ύψος των επιβαλλόμενων κυρώσεων, και το ύψος των φορολογικών συντελεστών. Επιπροσθέτως οι θεωρητικές και εμπειρικές μελέτες έχουν αναδείξει και άλλους σημαντικούς προσδιοριστικούς παράγοντες, όπως το ύψος του διαθέσιμου εισοδήματος, την πηγή των εισοδημάτων, την πολυπλοκότητα του φορολογικού συστήματος, το μέγεθος της παρατηρούμενης διαφθοράς, το επίπεδο της οικονομικής ανάπτυξης, τον βαθμό φορολογικής συνείδησης των φορολογουμένων, κ.α. Περαιτέρω στο παρόν άρθρο διερευνάται ειδικότερα το ζήτημα των πιθανοτήτων εντοπισμού της αποκλίνουσας φορολογικής συμπεριφοράς οι οποίες είναι άρρηκτα συνδεδεμένες με την διαδικασία των φορολογικών ελέγχων. Ουσιαστικά η συμβολή της διαδικασίας των φορολογικών ελέγχων στην αντιμετώπιση της φοροδιαφυγής, έγκειται περισσότερο στην καλλιέργεια και την ενδυνάμωση του κλίματος εκούσιας φορολογικής συμμόρφωσης και λιγότερο στην προφανή συνεισφορά τους στην βραχυχρόνια αύξηση των φορολογικών εσόδων.

Λέξεις-κλειδιά: Φοροδιαφυγή, Φορολογική Διοίκηση, Ανάλυση Κινδύνου

1. Εισαγωγή

Οι επιπτώσεις της έκτασης της μη φορολογικής συμμόρφωσης στα μεγέθη των Δημοσίων οικονομικών είναι πολυάριθμες και ιδιαίτερα καθοριστικές για την ανάπτυξη της οικονομίας ως συνόλου γενικότερα. Ειδικότερα σε μία οικονομία - όπως η Ελληνική - η οποία χαρακτηρίζεται από χρόνιες παθογένειες, ο περιορισμός της εκτεταμένης φοροδιαφυγής προβάλλει ως αδήριτη ανάγκη προκειμένου να αυξηθούν τα Δημόσια έσοδα και να αντιμετωπιστούν τα χρόνια δημοσιονομικά ελλείμματα, αλλά και για να απεγκλωβιστούν οι υγιείς παραγωγικές δυνάμεις από τον αθέμιτο ανταγωνισμό, προκειμένου να συμβάλλουν στην ανόρθωση της Εθνικής οικονομίας. Καθίσταται επομένως σαφές ότι η αντιμετώπιση του φαινομένου της φοροδιαφυγής στην τρέχουσα ιδιαίτερα δυσμενή συγκυρία για την Ελληνική οικονομία προβάλλει πιο επιτακτική από ποτέ.

Η μη φορολογική συμμόρφωση έχει ως αποτέλεσμα την υστέρηση των Δημοσίων εσόδων, η οποία με την σειρά της οδηγεί στον περιορισμό των παροχών κοινωνικού χαρακτήρα προς τους πολίτες, και θέτει εκτός στόχων την προσπάθεια υλοποίησης του κρατικού προϋπολογισμού. Παράλληλα το

φαινόμενο αυτό προκαλεί στρεβλώσεις στην άσκηση της οικονομικής πολιτικής καθώς επίσης και στην υλοποίηση των τιθέμενων στόχων της. Επιπροσθέτως η φοροδιαφυγή έχει άμεσες επιπτώσεις στην κατανομή των φορολογικών βαρών μεταξύ των φορολογουμένων που ευθυγραμμίζονται με την φορολογική νομοθεσία και των όσων φοροδιαφεύγουν, προκαλώντας πρόσθετες φορολογικές επιβαρύνσεις για τους πρώτους. Η απώλεια φορολογικών εσόδων λόγω της φοροδιαφυγής μπορεί να έχει ως αποτέλεσμα, την επιβολή αυξημένων φόρων στα εισοδήματα που δηλώνονται προκειμένου να υπάρξει αντιστάθμιση αυτών των απωλειών.

Η στρατηγική αντιμετώπισης της μη φορολογικής συμμόρφωσης περιλαμβάνει διάφορες τακτικές, οι κυριότερες από τις οποίες εστιάζονται στα αυξημένα ποσοστά φορολογικού ελέγχου, στην επέκταση του εύρους της διαδικασίας του φορολογικού ελέγχου, στην καθιέρωση αυστηρότερων διοικητικών και ποινικών κυρώσεων για την διάπραξη φορολογικών παραβάσεων, στην διαπόμπευση των φοροφυγάδων κ.α. Αποτελεί κοινή παραδοχή ότι η διαδικασία των φορολογικών ελέγχων θεωρείται η κορωνίδα των διατιθέμενων μέσων επιβολής της φορολογικής διοίκησης, για την συρρίκνωση της φοροδιαφυγής και την εδραίωση της φορολογικής συμμόρφωσης. Βέβαια η διαπίστωση αυτή τελεί υπό την προϋπόθεση της αποτελεσματικής λειτουργίας του συγκεκριμένου μέσου επιβολής, και της επιτυχούς εκπλήρωσης της αποστολής του.

Η φορολογική διοίκηση καλείται να υλοποιήσει μία ιδιαίτερα δύσκολη αποστολή, και μάλιστα σε μια εποχή στην οποία προβάλλει επιτακτική η ανάγκη για τον περιορισμό των δημοσιονομικών ελλειμμάτων και την δημιουργία πρωτογενών πλεονασμάτων. Πλέον οι σύγχρονες φορολογικές διοικήσεις έχουν αντιληφθεί ότι προκειμένου να επιτευχθεί ο στόχος τους θα πρέπει η φορολογική συμμόρφωση να προαχθεί διαμέσου ενός αντικειμενικού τρόπου επιλογής φορολογικών ελέγχων ο οποίος στηρίζεται σε επιστημονικές μεθόδους ανάλυσης κινδύνου. Η υστέρηση των φορολογικών εσόδων λόγω της περιορισμένης φορολογικής συμμόρφωσης προάγει ως λύση την υλοποίηση στοχευμένων φορολογικών ελέγχων, με προσανατολισμό σε εκείνες τις κατηγορίες φορολογουμένων οι οποίοι αποτελούν τον μεγαλύτερο κίνδυνο για τα δημόσια έσοδα, έναντι των ελέγχων οι οποίοι διενεργούνται σε τυχαία βάση.

Προκειμένου να οριοθετηθεί ένα πλαίσιο φορολογικών ελέγχων το οποίο θα στηρίζεται στις ανωτέρω αρχές, πρωτίστως θα πρέπει να διερευνηθεί ενδελεχώς και τεκμηριωμένα ποιοί είναι οι παράγοντες που προσδιορίζουν την συμμόρφωση των φορολογουμένων, ποιες είναι οι εκφάνσεις τους, καθώς επίσης και ο βαθμός στον οποίο ο καθένας ξεχωριστά, εντασσόμενος σε ένα σύνολο επιμέρους παραγόντων, επιδρά επί της φορολογικής συμμόρφωσης, καθορίζοντας εντέλει την φορολογική συμπεριφορά ειδικότερων κατηγοριών φορολογουμένων. Με προαπαιτούμενο την ανάλυση των προσδιοριστικών παραγόντων της φορολογικής συμμόρφωσης είναι εφικτός ο στόχος της κατάρτισης από την φορολογική διοίκηση, ισχυρών μοντέλων πρόβλεψης του βαθμού επικινδυνότητας και ροπής των φορολογουμένων προς την φοροδιαφυγή, η οποία στην Ελλάδα σύμφωνα με τον Μανεσιώτη (1990), αποτελεί την πιο μαζική και την περισσότερο ανεκτή εκδήλωση αντικοινωνικής συμπεριφοράς και παράβασης των σχετικών φορολογικών νόμων.

2. Οι προσδιοριστικοί παράγοντες της φορολογικής συμμόρφωσης

Από την ανασκόπηση της βιβλιογραφίας προκύπτει ότι η βασική θεωρία η οποία αποτέλεσε την βάση στην οποία στηρίχθηκαν οι ερευνητές του επιστημονικού πεδίου της φορολογικής συμμόρφωσης

είναι η θεωρία της αναμενόμενης χρησιμότητας (Expected Utility Theory - EUT). Η πρώτη εφαρμογή της εν λόγω θεωρίας πραγματοποιήθηκε από τους Allingham and Sandmo (1972), οι οποίοι με την θεωρητική τους ανάλυση, επιχείρησαν να διερευνήσουν την συμπεριφορά των μεμονωμένων φορολογουμένων κατά την διαδικασία λήψης των αποφάσεών τους. Η ανάλυσή τους αυτή η οποία είναι ίσως η σημαντικότερη στο συγκεκριμένο ερευνητικό πεδίο, αποτέλεσε το υπόβαθρο πολλών άλλων επιστημονικών μελετών.

Σύμφωνα με την ανάλυση των συγκεκριμένων ερευνητών, η αναμενόμενη χρησιμότητα την οποία προσπαθεί να μεγιστοποιήσει ο φορολογούμενος, προκύπτει από την κάτωθι εξίσωση:

$$E(U) = (1-p)U(W-\theta X) + pU(W-\theta X - \pi(W-X)) \quad (1)$$

Όπου:

- $E(U)$ = η αναμενόμενη χρησιμότητα
- p = η πιθανότητα εντοπισμού
- W = το πραγματικό εισόδημα
- θ = ο φορολογικός συντελεστής
- X = το δηλωθέν εισόδημα
- π = το ποσοστό της επιβαλλόμενης ποινής επί του μη δηλωθέντος εισοδήματος στην περίπτωση εντοπισμού

Από τον μετασχηματισμό της ανωτέρω εξίσωσης (1) οι εν λόγω ερευνητές κατέληξαν στην παρακάτω ανισότητα:

$$p \cdot \pi < \theta$$

από την οποία προκύπτει ότι οι φορολογούμενοι δεν θα συμμορφώνονται όταν το γινόμενο της πιθανότητας εντοπισμού επί του ποσοστού της επιβαλλόμενης ποινής είναι μικρότερο από τον φορολογικό συντελεστή για συγκεκριμένο ύψος μη δηλωθέντος εισοδήματος.

Επομένως η απόφαση των φορολογουμένων να φοροδιαφύγουν βρίσκεται σε άμεση συνάρτηση με την πιθανότητα εντοπισμού τους όπως αυτοί την αντιλαμβάνονται, καθώς επίσης και με την βαρύτητα των επιβαλλόμενων κυρώσεων. Στο υπόδειγμα αυτό οι κυρώσεις έχουν ως σημείο αναφοράς το μη δηλωθέν εισόδημα και όχι το ποσό των φόρων το οποίο έχει διαφύγει. Επομένως όταν τα οφέλη της φορολογικής συμμόρφωσης υπερκαλύπτουν τις επιπτώσεις της αποκλίνουσας φορολογικής συμπεριφοράς τότε οι φορολογούμενοι αποφασίζουν να συμμορφωθούν. Αντίστροφα όταν η προσδοκώμενη πρόσοδος η οποία πηγάζει από την μη σύννομη φορολογική συμπεριφορά είναι μεγαλύτερη από τα οφέλη της φορολογικής συμμόρφωσης τότε οι φορολογούμενοι επιλέγουν να μην συμμορφωθούν και να φοροδιαφύγουν. Συμπερασματικά όσο μεγαλύτερη είναι η πιθανότητα φορολογικού ελέγχου, καθώς και οι επιβαλλόμενες ποινές τόσο μεγαλύτερη θα είναι η φορολογική συμμόρφωση.

Δεδομένου ότι η φορολογική συμμόρφωση ή αντίστοιχα η μη φορολογική συμμόρφωση αποτελεί ένα πολυσύνθετο φαινόμενο αρκετοί είναι οι προσδιοριστικοί παράγοντες οι οποίοι αλληλεπιδρούν στην διαμόρφωση των συγκεκριμένων μεγεθών. Οι βασικοί προσδιοριστικοί παράγοντες όπως ήδη έχει αναφερθεί στο υπόδειγμα των Allingham and Sandmo (1972), είναι οι πιθανότητες εντοπισμού,

το ύψος των επιβαλλόμενων κυρώσεων, και το ύψος των φορολογικών συντελεστών. Εκτός των βασικών αποτρεπτικών παραγόντων της μη φορολογικής συμμόρφωσης, οι θεωρητικές και εμπειρικές μελέτες των ερευνητών έχουν αναδείξει και άλλους εναλλακτικούς προσδιοριστικούς παράγοντες, όπως το ύψος του διαθέσιμου εισοδήματος, την πηγή των εισοδημάτων, την πολυπλοκότητα του φορολογικού συστήματος, το μέγεθος της παρατηρούμενης διαφθοράς, το επίπεδο της οικονομικής ανάπτυξης, τον βαθμό φορολογικής συνείδησης των φορολογουμένων, κ.α. Παρακάτω θα εξετασθούν περιεκτικά οι βασικοί προσδιοριστικοί παράγοντες που επηρεάζουν την φορολογική συμμόρφωση.

Οι επιβαλλόμενες ποινές σε όσους φοροδιαφεύγουν, αποτελούν ένα εργαλείο της φορολογικής διοίκησης το οποίο χρησιμοποιείται προκειμένου να ελέγξει το βαθμό της φορολογικής συμμόρφωσης. Οι ποινές διακρίνονται στις διοικητικές και τις ποινικές. Οι διοικητικές κυρώσεις στην βασική τους εκδοχή περιλαμβάνουν τις προσαυξήσεις και τους προσθέτους φόρους οι οποίοι επιβάλλονται με συγκεκριμένο συντελεστή επί των φόρων που αντιστοιχούν στο φορολογητέο εισόδημα το οποίο είτε δεν είχε δηλωθεί, ή είχε δηλωθεί ανακριβώς, ή δηλώθηκε εκπρόθεσμα, καθώς επίσης και τα φορολογικά πρόστιμα τα οποία επιβάλλονται για την διάπραξη φορολογικών παραβάσεων, και λοιπά μέτρα διοικητικού χαρακτήρα. Οι ποινικές κυρώσεις για την διάπραξη φορολογικών αδικημάτων περιλαμβάνουν την ποινή της φυλάκισης και της κάθειρξης.

Η επίδραση των ποινών στην διαμόρφωση της φορολογικής συμμόρφωσης είναι συνάρτηση του ύψους τους, ανάλογα βέβαια και με το μέγεθος του μη δηλωθέντων εισοδημάτων ή και των φορολογικών παραβάσεων. Ο Blumstein (1983) υποστήριξε ότι η μη φορολογική συμμόρφωση, θα μπορούσε να περιοριστεί με την επιβολή αυστηρότερων διοικητικών ποινών στην περίπτωση της συντελεσθείσας φοροδιαφυγής. Ειδικότερα, οι φορολογούμενοι οι οποίοι αποφεύγουν την ανάληψη κινδύνου ωθούνται να δηλώσουν μεγαλύτερο μέρος των εισοδημάτων τους όταν οι επιβαλλόμενες κυρώσεις είναι ανάλογες με το ύψος των φόρων οι οποίοι δεν έχουν αποδοθεί Beck and Jung (1989).

Επίσης οι Jackson and Milliron (1986) κατέληξαν στο συμπέρασμα ότι η μη φορολογική συμμόρφωση μειώνεται με την αύξηση των ποσοστών των επιβαλλόμενων προσθέτων φόρων και των φορολογικών προστίμων. Βέβαια σύμφωνα με τον Bayer (2004) τα μεγέθη των φορολογικών ποινών που επιβάλλουν οι φορολογικές αρχές θα πρέπει να είναι τέτοια, έτσι ώστε να επιτελούν τον σκοπό του παραδειγματισμού των φορολογουμένων προς αποφυγή υποτροπής τους, και όχι να επιφέρουν την οικονομική τους εξάντληση. Αντίθετα όταν οι επιβαλλόμενες κυρώσεις για τις φορολογικές παραβάσεις θεωρούνται από τους φορολογούμενους ως ήπιες, τότε αυτοί υπολογίζουν ότι η φοροδιαφυγή είναι μία κερδοφόρα διαδικασία και δεν διστάζουν να φοροδιαφύγουν, ακόμα και όταν οι πιθανότητες εντοπισμού είναι ιδιαίτερα μεγάλες.

Επικουρικά με τις επιβαλλόμενες κυρώσεις η γνωστοποίηση των στοιχείων των όσων φοροδιαφεύγουν είναι ένα μέτρο που ενισχύει την αποτρεπτική ικανότητα της φορολογικής διοίκησης. Οι φορολογούμενοι γνωρίζοντας ότι η καταφυγή στην φοροδιαφυγή λειτουργεί σε βάρος του κοινωνικού συνόλου αναλαμβάνουν και τον κίνδυνο της μείωσης της προσωπικότητάς τους καθώς επίσης και του στιγματισμού τους στην περίπτωση εντοπισμού τους (Bosco and Mittone, 1997). Η εφαρμογή αυτού του μέτρου θα έπληττε πολύ περισσότερο σε περίπτωση εντοπισμού της μη φορολογικής τους συμμόρφωσης, αυτούς τους φορολογούμενους των οποίων η επιτυχημένη δραστηριότητα συναρτάται σε σημαντικό βαθμό με την καλή φήμη που έχουν αποκτήσει.

Η φορολογική συμμόρφωση δεν εξαρτάται μόνο από τις πιθανότητες εντοπισμού και τις διοικητικές κυρώσεις, αλλά μεταξύ άλλων παραγόντων και από την απώλεια της καλής φήμης η οποία συνοδεύει ορισμένους κλάδους επαγγελματιών στην περίπτωση της ανάδειξης της συντελούμενης φοροδιαφυγής. Οι επαγγελματικές ομάδες οι οποίες διακινδυνεύουν την φήμη τους εφόσον εντοπιστούν να προβαίνουν σε πράξεις ή παραλείψεις που συνιστούν φοροδιαφυγή, θεωρείται ότι είναι λιγότερο πιθανό να μην συμμορφώνονται σε σχέση με επαγγελματικές ομάδες των οποίων η επιτυχημένη δραστηριοποίηση σχετίζεται λιγότερο με τον παράγοντα της καλής φήμης (Forest and Kirchler, 2008).

Εκτός από τις επιβαλλόμενες κυρώσεις για την επίτευξη μεγαλύτερης φορολογικής συμμόρφωσης σημαντικά θα συνέβαλε προς αυτήν την κατεύθυνση και η υιοθέτηση του μέτρου των χρηματικών ή άλλων ανταμοιβών για όσους φορολογούμενους δεν παρεκκλίνουν από τις διατάξεις της κείμενης φορολογικής νομοθεσίας. Ένα βέλτιστο μίγμα κυρώσεων και ανταμοιβών εγγυάται ένα ορισμένο επίπεδο εσόδων για την φορολογική διοίκηση ενώ παράλληλα μεγιστοποιεί την αναμενόμενη χρησιμότητα των φορολογουμένων (Falkinger and Walther, 1991).

Η επίδραση των φορολογικών συντελεστών αποτελεί τον τρίτο κατά σειρά σημαντικότητας προσδιοριστικό παράγοντα της φορολογικής συμμόρφωσης που αναφέρεται στην διεθνή αρθρογραφία. Η βασική παραδοχή που προκρίνεται είναι και η αναμενόμενη. Το ύψος δηλαδή των φορολογικών συντελεστών παρουσιάζει θετική συσχέτιση με την μη φορολογική συμμόρφωση. Οι Alm et al. (1992) αξιολογώντας τα δεδομένα της έρευνας τους αποφάνθηκαν ότι η φορολογική συμμόρφωση των μεμονωμένων φορολογουμένων αυξάνεται όταν επιβάλλονται χαμηλότεροι φορολογικοί συντελεστές. Αντίστοιχα οι Jackson and Milliron (1986) υποστήριζαν ότι η μη συμμόρφωση βαίνει αυξανόμενη με την αύξηση των φορολογικών συντελεστών. Σε ανάλογο αποτέλεσμα για την εταιρική φορολογική συμμόρφωση κατέληξε στην έρευνά του και ο Joulfaian (2000).

Το διαθέσιμο εισόδημα αποτελεί έναν πρόσθετο προσδιοριστικό παράγοντα της φορολογικής συμμόρφωσης. Ιδιαίτερη σημασία αποκτά η σημασία του προσδιοριστικού αυτού παράγοντα στην αξιολόγηση φορολογικών αντικειμένων τα οποία διακρίνονται για τον προοδευτικό τους χαρακτήρα, όπως είναι η φορολογία εισοδήματος φυσικών προσώπων με βάση τις διατάξεις της οποίας φορολογούνται οι ατομικές επιχειρήσεις. Σε αυτή την περίπτωση καθώς τα κλίμακια των φορολογητέων εισοδημάτων συσχετίζονται με την εφαρμογή φορολογικών συντελεστών, οι οποίοι στα πλαίσια της προοδευτικής κλίμακας φορολόγησης βαίνουν αυξανόμενοι ανάλογα με το ύψος του δηλωθέντος εισοδήματος, το κίνητρο σκόπιμης μη φορολογικής συμμόρφωσης για κάθε φορολογούμενο και για κάθε εισοδηματικό του κλίμακιο είναι διαφορετικό. Και οι ευκαιρίες για τους φορολογούμενους να προβούν σε τέτοιες ενέργειες που απορρέουν κυρίως από την πολυπλοκότητα των φορολογικών κλιμάκων, είναι πολλές (Αρμάγου κ.α., 2005). Με βάση το ύψος των φορολογητέων εισοδημάτων που δηλώνουν οι φορολογούμενοι προκύπτει και ένας διαφορετικός βαθμός συμμόρφωσής τους. Χρησιμοποιώντας στοιχεία από την γνωστή για την αποτελεσματικότητα της Αμερικάνικη φορολογική υπηρεσία Internal Revenue Service (IRS) ο Cox (1984), έδειξε ότι συμμορφώνονται λιγότερο οι φορολογούμενοι οι οποίοι στις φορολογικές δηλώσεις τους, δηλώνουν κατά μέσο όρο χαμηλά εισοδήματα καθώς επίσης και αυτοί που δηλώνουν υψηλά εισοδήματα.

Μια πρόσφατη έρευνα των Matsaganis and Flevotomou (2010) για την φοροδιαφυγή στην Ελλάδα η οποία βασίστηκε σε ένα ανώνυμο τυχαίο δείγμα φορολογικών δηλώσεων φυσικών προσώπων του οικονομικού έτους 2005 (για τα εισοδήματα που αποκτήθηκαν κατά το 2004), και την σύγκριση των δεδομένων αυτού με τα στοιχεία που προέκυψαν από την έρευνα των οικογενειακών προϋπολογισμών του ιδίου έτους της Ελληνικής Στατιστικής Αρχής (ΕΛΣΤΑΤ), κατέδειξε το αναμενόμενο και επιβεβαίωσε τον ισχυρισμό του Cox (1984). Συγκεκριμένα με βάση τα αποτελέσματα της έρευνας αυτής υποστηρίχθηκε ότι ενώ συνολικά αποκρύπτεται κατά μέσο όρο σχεδόν το 10% του φορολογητέου εισοδήματος, η εξέταση ανά εισοδηματικό κλίμακιο δείχνει ότι η φοροδιαφυγή είναι πιο εκτεταμένη στα άκρα της εισοδηματικής κατανομής: το πλουσιότερο 10% του πληθυσμού αποκρύπτει το 15% του εισοδήματός του (το πλουσιότερο 1% αποκρύπτει 24%), το φτωχότερο 30% μεταξύ 10% και 11%, ενώ τα ενδιάμεσα έξι εισοδηματικά στρώματα από 5% έως 8%.

Ωστόσο σημαντική διαφαίνεται να είναι και η επίδραση που ασκείται στο ύψος των δηλωθέντων φορολογητέων εισοδημάτων ακόμη και σε είδη φόρων στα οποία επιβάλλεται αναλογικός φορολογικός συντελεστής όπως είναι ο φόρος εισοδήματος νομικών προσώπων. Η συγκεκριμένη διαπίστωση προκύπτει όταν επιχειρείται διαχρονική ανάλυση της εξέλιξης της μεταβολής τους η οποία δυνητικά πηγάζει από αντίστοιχη διαφοροποίηση των ισχυόντων αναλογικών φορολογικών συντελεστών.

Ένας ακόμη προσδιοριστικός παράγοντας της φορολογικής συμμόρφωσης είναι και η πηγή των εισοδημάτων των φορολογουμένων. Οι δυνατότητες σκόπιμης μη φορολογικής συμμόρφωσης προσδιορίζονται από το είδος της επαγγελματικής ενασχόλησης ή και του κλάδου δραστηριοποίησης (Frederiksen et al., 2005). Έτσι οι φορολογούμενοι οι οποίοι δηλώνουν εισοδήματα από μισθωτή εργασία θεωρητικά είναι πολύ πιο δύσκολο να φοροδιαφύγουν σε σχέση τους φορολογούμενους οι οποίοι δηλώνουν εισοδήματα από εμπορικές επιχειρήσεις ή ελευθέρια επαγγέλματα.

Το μέγεθος της πολυπλοκότητας των φορολογικών νόμων φαίνεται να συσχετίζεται σε σημαντικό βαθμό με το επίπεδο της φορολογικής συμμόρφωσης (Milliron, 1985). Τα φορολογικά συστήματα στις περισσότερες αναπτυγμένες χώρες με την πάροδο του χρόνου έγιναν περισσότερα σύνθετα, και κατ' επέκταση η αυξανόμενη πολυπλοκότητα η οποία τα χαρακτηρίζει αποτέλεσε ένα καθοριστικό προσδιοριστικό παράγοντα φοροδιαφυγής στις χώρες αυτές (Richardson and Sawyer, 2001). Η αναγνώριση του τυχαίου χαρακτήρα της επιβολής του φορολογικού συστήματος και η μη ορθή απόδοση της φορολογικής δικαιοσύνης οι οποίες απορρέουν από την υπέρμετρη γραφειοκρατία του φορολογικού συστήματος, όταν περιέρχονται σε γνώση των φορολογουμένων συντελούν στην όξυνση του αισθήματος της αδικίας που πολλές φορές τους διακατέχει. Η διαπίστωση αυτή με την σειρά της οδηγεί στον περιορισμό της εθελοντικής φορολογικής συμμόρφωσής τους.

Η επίδραση του φαινομένου της διαφθοράς και της έκτασης αυτής στην διαμόρφωση του μεγέθους της φοροδιαφυγής είναι δεδομένη και αναντίρρητη. Όταν η παρατηρούμενη διαφθορά στον κρατικό μηχανισμό και ιδιαίτερα στο προσωπικό της φορολογικής διοίκησης είναι ιδιαίτερα εκτεταμένη, τότε το γεγονός αυτό έχει σαν αποτέλεσμα τον περιορισμό της φορολογικής συμμόρφωσης. Συνεπακόλουθα η παρουσία φαινομένων εκτεταμένης διαφθοράς παρουσιάζει ισχυρή συσχέτιση με τον περιορισμό των φορολογικών εσόδων (Tanzi and Davoodi, 2000). Σε αυτή την περίπτωση οι φορολογούμενοι προκειμένου να μην καταβάλλουν τους αναλογούντες φόρους και σταθμίζοντας τα οφέλη που θα εξασφαλίσουν, δεν διστάζουν να καταφύγουν στον χρηματισμό επίορκων κρατικών

λειτουργιών προκειμένου να επιτύχουν αυτήν τους την επιδίωξη. Η διαφθορά προσδιορίζεται από το επίπεδο οικονομικής ανάπτυξης, καθώς επίσης και από τα πρότυπα ηθικής τα οποία έχουν καλλιεργηθεί στον κοινωνικό ιστό.

Ένας ακόμη προσδιοριστικός παράγοντας της φορολογικής συμμόρφωσης είναι το επίπεδο της οικονομικής ανάπτυξης. Η περιορισμένη φορολογική συμμόρφωση επιχειρήσεων και φορολογουμένων φυσικών προσώπων χαρακτηρίζει κυρίως τις αναπτυσσόμενες χώρες. Η εξέταση του φαινομένου της φοροδιαφυγής από τους μελετητές του ερευνητικού αυτού πεδίου, αλλά και τα πορίσματα των εκθέσεων των διεθνών οργανισμών καταδεικνύουν ότι η έκταση της φοροδιαφυγής είναι πολύ μεγαλύτερη στις αναπτυσσόμενες χώρες σε σχέση με αυτή που παρατηρείται στις αναπτυγμένες χώρες. Και στις δύο κατηγορίες χωρών, η έκταση της μη φορολογικής συμμόρφωσης διαχρονικά έχει ως αποτέλεσμα τον σοβαρό περιορισμό των φορολογικών εσόδων που εισρέουν στα Δημόσια ταμεία.

Επιπροσθέτως η φορολογική συνείδηση αποτελεί ένα προσδιοριστικό παράγοντα με ιδιαίτερη βαρύτητα για την βελτίωση του γενικού επιπέδου της φορολογικής συμμόρφωσης και σχετίζεται άμεσα με την δημιουργία και εμπέδωση του κατάλληλου κλίματος εμπιστοσύνης στις σχέσεις κράτους-φορολογουμένων, το οποίο απορρέει από το πνεύμα δικαίου του φορολογικού συστήματος αλλά και από την επίσης δίκαιη εφαρμογή των φορολογικών νομοθετημάτων. Ο Torgler (2003) διαπίστωσε ότι το επίπεδο της φορολογικής ηθικής ή άλλως της φορολογικής συνείδησης των φορολογουμένων συσχετίζεται αρνητικά με την εκτιμώμενη φοροδιαφυγή.

Τέλος θα πρέπει να αναφερθεί ότι από την ανασκόπηση του θεωρητικού πλαισίου του συγκεκριμένου ερευνητικού πεδίου προκύπτει ότι υφίστανται και ορισμένοι ακόμη παράγοντες οι οποίοι επηρεάζουν την φορολογική συμμόρφωση. Ειδικότερα έχουν αναφερθεί τα δημογραφικά χαρακτηριστικά των φορολογουμένων, όπως η ηλικία, το φύλο, ή το μορφωτικό επίπεδο. Εξάλλου η γεωγραφική περιοχή αποτελεί έναν επιπρόσθετο προσδιοριστικό παράγοντα. Περαιτέρω καθοριστικός είναι και ο συμβουλευτικός ρόλος που επιτελούν οι λογιστές – φορολογικοί σύμβουλοι επιχειρήσεων και μεμονωμένων φορολογουμένων. Ακόμη σημαντική φαίνεται να είναι και η επίδραση που ασκείται από την κατά καιρούς υιοθέτηση από την φορολογική διοίκηση και εφαρμογή, προγραμμάτων φορολογικών αμνηστιών. Η πλέον όμως καθοριστική συνεισφορά επί του σχηματισμού του φορολογικού «προφίλ» των φορολογουμένων προέρχεται από τον φορολογικό έλεγχο, ο οποίος ουσιαστικά αποτελεί ένα διατιθέμενο μέσο επιβολής της φορολογικής διοίκησης. Για την συμβολή του φορολογικού ελέγχου θα υπάρξει ιδιαίτερη αναφορά στην επόμενη ενότητα.

3. Η συμβολή του φορολογικού ελέγχου στην διαμόρφωση της φορολογικής συμμόρφωσης

Η πιθανότητα εντοπισμού της αποκλίνουσας φορολογικής συμπεριφοράς στο ανωτέρω αναφερόμενο θεωρητικό υπόδειγμα των Allingham and Sandmo (1972), είναι άρρηκτα συνδεδεμένη με την διαδικασία του φορολογικού ελέγχου. Η διενέργεια των φορολογικών ελέγχων από την φορολογική διοίκηση αποσκοπεί στον περιορισμό του φορολογικού χάσματος (tax gap) μεταξύ των φόρων οι οποίοι προέρχονται από την εθελοντική φορολογική συμμόρφωση, και των φόρων οι οποίοι οφείλονται πραγματικά, και παράλληλα στην ενίσχυση της φορολογικής συμμόρφωσης.

Ο φορολογικός έλεγχος αποτελεί σημαντική λειτουργία του κράτους διότι σε αυτόν βρίσκουν μεταξύ άλλων εφαρμογή οι συνταγματικές αρχές για ισοδύναμη συμμετοχή των πολιτών στα οικονομικά βάρη, οι δε συνέπειες του είναι σημαντικές σε όλο το φάσμα των κοινωνικών και κυρίως οικονομικών δραστηριοτήτων. Με τους φορολογικούς ελέγχους εκτός από την διασφάλιση των συμφερόντων του Δημοσίου, εξυπηρετούνται και άλλοι εξίσου σημαντικοί σκοποί όπως:

- Η δίκαιη κατανομή των φορολογικών βαρών.
- Η προστασία των υγιών επιχειρήσεων από τον αθέμιτο ανταγωνισμό.
- Η διαρκής ενημέρωση των φορολογουμένων σχετικά με τις φορολογικές τους υποχρεώσεις.
- Η αύξηση της εθελούσιας συμμόρφωσης μέσα από την εμπέδωση της φορολογικής συνείδησης (Μιχαήλ κ.α., 2008).

Η διενέργεια των φορολογικών ελέγχων εκτός από την προφανή συνεισφορά τους στην αύξηση των φορολογικών εσόδων, παρουσιάζει μία γενικότερη επίδραση στην διαδικασία της φορολογικής συμμόρφωσης η οποία είναι και η πλέον σημαντική. Σύμφωνα με τους Dubin et al. (1990), η πραγματοποίηση των φορολογικών ελέγχων έχει ένα άμεσο και ένα έμμεσο αποτέλεσμα. Το άμεσο αποτέλεσμα αναφέρεται στα φορολογικά έσοδα τα οποία εισρέουν στα κρατικά ταμεία από τους επιβαλλόμενους φόρους και τα φορολογικά πρόστιμα, και το έμμεσο αποτέλεσμα αφορά την αύξηση του ποσοστού της εθελοντικής συμμόρφωσης. Υποστήριξαν μάλιστα ότι το αποτέλεσμα της αύξησης της εθελοντικής συμμόρφωσης συμμετέχει σε ποσοστό 85% στο συνολικό αποτέλεσμα επί της φορολογικής συμμόρφωσης το οποίο επιφέρει η διεξαγωγή των φορολογικών ελέγχων.

Εξάλλου σύμφωνα με το IRS η διενέργεια φορολογικών ελέγχων ασκεί μία ειδική και μία γενική θετική επίδραση στην προσπάθεια αποτροπής της μη φορολογικής συμμόρφωσης. Η ειδική επίδραση αναφέρεται στην μελλοντική αύξηση της συμμόρφωσης αυτών που έχουν ελεγχθεί, ενώ η γενική σχετίζεται με την έκταση της προώθησης της συμμόρφωσης στους υπόλοιπους φορολογουμένους, λόγω της αντίληψης που σχηματίζουν οι δεύτεροι για επαπειλούμενο φορολογικό έλεγχο και στους ίδιους. Αν και τα προγράμματα φορολογικής συμμόρφωσης και συλλογής των φόρων του IRS εστιάζουν στους φορολογούμενους που φοροδιαφεύγουν, το IRS θεωρεί ότι η επίδραση των αποτρεπτικών παραγόντων αυτών των προγραμμάτων ασκεί επίδραση επί του συνόλου των φορολογουμένων (United States General Accounting Office, 1992).

Επομένως ουσιαστικά η συμβολή των φορολογικών ελέγχων έγκειται περισσότερο στην καλλιέργεια και την ενδυνάμωση του κλίματος εκούσιας φορολογικής συμμόρφωσης δοθέντος μάλιστα ότι και τα περισσότερα φορολογικά συστήματα των αναπτυγμένων κρατών εδράζονται σε αυτήν ακριβώς την έννοια. Ουσιαστικά η άμεση συνεισφορά των φορολογικών ελέγχων - χωρίς βέβαια αυτή να παραγνωρίζεται - στα συνολικά φορολογικά έσοδα είναι μικρή δεδομένων των περιορισμών των διαθεσίμων πόρων και κατ' επέκταση των χαμηλών ποσοστών φορολογικού ελέγχου.

Αν και η επίδραση των φορολογικών ελέγχων στην διαμόρφωση της φορολογικής συμμόρφωσης του γενικού πληθυσμού των φορολογουμένων είναι δεδομένη, εύλογα ανακύπτει το θέμα της διαμόρφωσης της φορολογικής συμπεριφοράς των ήδη ελεγμένων, μετά την διενέργεια του ελέγχου. Οι Alm and MCkee (2006) βασιζόμενοι στο μοντέλο που συνέθεσαν, κατάφεραν να αποτυπώσουν την συμπεριφορά των φορολογουμένων κατά την διάρκεια μιας μακράς σειράς περιόδων, και επιπροσθέτως να την συσχετίσουν με προηγούμενη τυχόν εμπειρία φορολογικού ελέγχου των φορολογουμένων. Πέρα από την διαπιστούμενη αναμενόμενη θετική συσχέτιση μεταξύ του ποσοστού των φορολογικών ελέγχων και της φορολογικής συμμόρφωσης των φορολογουμένων,

απέδειξαν ότι τμήμα της αύξησης της φορολογικής συμμόρφωσης προερχόταν και από τους φορολογούμενους, οι οποίοι γνώριζαν εκ των προτέρων ότι δεν επρόκειτο να ελεγχθούν στην τρέχουσα φορολογική περίοδο.

Ωστόσο τα ανωτέρω αναφερόμενα έχουν ως βάση αναφοράς και προαπαιτούμενο το γεγονός ότι οι φορολογικοί έλεγχοι είναι αδιάβλητοι και αποτελεσματικοί επιτυγχάνοντας να αναδείξουν το πραγματικό μέγεθος της μη φορολογικής συμμόρφωσης. Σε αντίθετη περίπτωση η μελλοντική φορολογική συμμόρφωση των ήδη ελεγχόμενων διαφοροποιείται σημαντικά. Οι Andreoni et al. (1998) υποστήριζαν ότι η προηγούμενη εμπειρία των φορολογουμένων που έχουν δεχθεί έναν φορολογικό έλεγχο πιθανόν να αποτελεί μία παράμετρο με περιορισμένη αποτρεπτική επίδραση επί της μη συμμόρφωσης. Το γεγονός αυτό ίσως οφείλεται σε μια αποτυχία του συγκεκριμένου φορολογικού ελέγχου να αναδείξει την συντελεσθείσα μη συμμόρφωση σε όλη της την έκταση, η οποία συνεπακόλουθα επιφέρει τον περιορισμό του αρχικού αισθήματος φοβίας που εν γένει συνειρμικά συνδέεται με τον επαπειλούμενο φορολογικό έλεγχο. Σύμφωνα με τους Antonides and Robben (1995) όταν ο φορολογικός έλεγχος αδυνατεί να εντοπίσει την συντελεσθείσα φοροδιαφυγή στις υποθέσεις που ελέγχονται, τότε η τάση φοροδιαφυγής ενισχύεται ενώ παράλληλα περιορίζεται η αποτρεπτική δράση των φορολογικών ελέγχων και των κυρώσεων.

Οι φορολογικές διοικήσεις προκειμένου να υλοποιήσουν την διαδικασία των φορολογικών ελέγχων έχουν θεσμοθετήσει διάφορους τρόπους επιλογής των φορολογουμένων οι οποίοι είναι περισσότερο πιθανό να φοροδιαφεύγουν. Σε πολλά από τα αναπτυγμένα κράτη υπάρχουν προγράμματα φορολογικών ελέγχων τα οποία είναι προσαρμοσμένα στις ιδιαιτερότητες των φορολογικών τους συστημάτων, βάσει των οποίων πραγματοποιείται αυτή η επιλογή με τρόπο ο οποίος στηρίζεται σε επιστημονικές μεθόδους και αναλύσεις. Ωστόσο όμως ένα ποσοστό των διενεργούμενων φορολογικών ελέγχων θα πρέπει να πραγματοποιείται κατόπιν επιλογής με τυχαία δειγματοληψία. Το γεγονός αυτό δεν συντελεί μόνο στην ενίσχυση του μη προβλέψιμου χαρακτήρα των ελέγχων, αλλά και επίσης συμβάλει στην δημιουργία μιας μόνιμης βάσης ερευνητικών δεδομένων η οποία παρέχει ενδείξεις για τους κινδύνους της μη φορολογικής συμμόρφωσης των επιχειρήσεων (European Commission, 2010).

Συμπερασματικά, η διενέργεια των φορολογικών ελέγχων αποτελεί την πλέον καθοριστική παράμετρο για την επίτευξη ενός επιθυμητού επιπέδου φορολογικής συμμόρφωσης. Η συμβολή της διενέργειας των φορολογικών ελέγχων στην επαύξηση των μεγεθών της φορολογικής συμμόρφωσης είναι συνάρτηση του βαθμού αποτελεσματικότητάς τους και της ανάδειξης του πραγματικού μεγέθους της μη δηλωθείσας φορολογητέας ύλης. Η φορολογική συμμόρφωση που επιτυγχάνεται ύστερα από την ορθή εφαρμογή των αρχών και πρακτικών της ελεγκτικής διαδικασίας, αναφέρεται τόσο στους φορολογούμενους που έχουν ήδη ελεγχθεί όσο και στους φορολογούμενους οι οποίοι δεν ελέγχθηκαν. Η ωφέλεια που προκύπτει διαχρονικά είναι κατά πολύ σημαντικότερη για τα Δημόσια έσοδα, από το ποσό των φόρων που εισρέει άμεσα στα κρατικά ταμεία, ως αποτέλεσμα της διαδικασίας του φορολογικού ελέγχου.

4. Συμπεράσματα

Αναντίρρητα η εκτεταμένη μη φορολογική συμμόρφωση συνιστά ένα πρόβλημα με πολύπλευρες διαστάσεις και αποτελεί ανασταλτικό και αποσταθεροποιητικό παράγοντα τόσο για το σύνολο της

οικονομίας σε μακροοικονομικό και μικροοικονομικό επίπεδο, όσο και για την κοινωνική ευημερία, και την προάσπιση βασικών συνταγματικών αρχών. Οι επιπτώσεις της περιορισμένης συμμόρφωσης των φορολογουμένων στα μεγέθη των Δημοσίων οικονομικών είναι πολυάριθμες και ιδιαίτερα σημαντικές.

Προκειμένου να αντιμετωπιστεί το φαινόμενο αυτό, θα πρέπει να εντοπισθούν να ερμηνευθούν και να οι ιεραρχηθούν οι προσδιοριστικοί παράγοντες της φορολογικής συμμόρφωσης. Η φορολογική διοίκηση υιοθετώντας και εφαρμόζοντας μεθόδους ανάλυσης και διαχείρισης κινδύνων φορολογικής συμμόρφωσης, και αξιοποιώντας τα δεδομένα της ανάλυσης του πλαισίου των προσδιοριστικών παραγόντων, δύναται να κατευθύνει την διαδικασία του φορολογικού ελέγχου προς τα τμήματα εκείνα των φορολογουμένων τα οποία βάσει της ανάλυσης κινδύνου παρουσιάζουν τον μεγαλύτερο κίνδυνο μη συμμόρφωσης. Με τον τρόπο αυτό η διαδικασία του φορολογικού ελέγχου, η οποία αποτελεί το ισχυρότερο μέσο επιβολής της φορολογικής διοίκησης, θα παράγει τα βέλτιστα δυνατά αποτελέσματα.

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