ISSN 1644-0757
eISSN 2450-4602

SCIENTIARUM POLONORUM

ACTA

Oeconomia

14 (4) 2015

ACTA SCIENTIARUM POLONORUM

Czasopismo naukowe założone w 2001 roku przez polskie uczelnie rolnicze
Scientific Journal established in 2001 by Polish Life Sciences Universities

Oeconomia

Economics

Ekonomia

14 (4) 2015

Bydgoszcz Kraków Lublin Olsztyn
Poznań Siedlce Szczecin Warszawa Wrocław

ISSN 1644-0757, eISSN 2450-4602
Edition: 200 prints

Wydawnictwo SGGW, ul. Nowoursynowska 166, 02-787 Warszawa
tel. 22 593 55 20 (-22; -25 – sprzedaż), fax 22 593 55 21
e-mail: wydawnictwo@sggw.pl
www.wydawnictwosggw.pl

Print: Agencja Reklamowo-Wydawnicza A. Grzegorczyk, www.grzeg.com.pl

From the Scientific Board

There has been the fourteenth year of the Acta Scientiarum Polonorum Oeconomia publishing. The Acta is the periodical including several thematic series with uniform graphics and similar format. The publication was set up by group of enthusiasts – employees of life sciences universities and has been published under the patronage of rectors of these universities. Constant involvement of academic society in increasing substantive and editorial level of the series, with efforts of the authors, the Programming Board and the Scientific Boards, has contributed to placing the Acta Scientiarum Polonorum (and our Oeconomia series) on the noticeable position in academic research society. Articles can be prepared in English with Polish title, abstract and keywords. Moreover, we publish latest issues in English only. The Scientific Board of the Oeconomia series, concerning the publication range, focuses its attention both on substantive content and precision of the form. The articles are revised in "double-blind review" process. Whole content of the Acta Scientiarum Polonorum Oeconomia is available in electronic version on the following website http://acta_oeconomia.sggw.pl. We are glad to inform that Acta Scientiarum Polonorum Oeconomia are indexed within the AGRIS-FAO, EBSCO, SIGŻ, Copernicus Index, AGRO, BazEkon. Since 2013 each article published in Acta Sci. Pol. Oeconomia has 10 points at the Ministry of Science and Higher Education ranking list.

Please send the articles on one of following e-mail addresses:

janina_sawicka@sggw.pl

acta_oeconomia@sggw.pl

While sending a printout, please attach also the electronic version on CD or DVD. Letters including note "the Acta Scientiarum Polonorum Oeconomia" should be sent on the following address:

Prof. dr hab. Janina Sawicka
Department of European Policy, Public Finances and Marketing
Faculty of Economic Sciences
Warsaw University of Life Sciences
Nowoursynowska 166, 02-787 Warsaw, Poland
tel.: (+4822) 593 40 70; fax: (+4822) 593 40 77

Yours sincerely
Janina Sawicka
Chairperson of the Scientific Board of the Acta Sci. Pol. Oeconomia series

List of reviewers 2015

prof. dr hab. Stanisława Bartosiewicz
prof. dr hab. Ewa Bojar
prof. dr hab. Georgij Czerewko
prof. dr hab. Eliza Frejtag-Mika
prof. dr hab. Maria Golinowska
prof. dr hab. Lilianna Jabłońska
prof. dr hab. Roman Kisiel
prof. dr hab. Jacek Kulawik
prof. dr hab. Wiesław Musiał
prof. dr hab. Janina Sawicka
prof. dr hab. Jadwiga Seremak-Bulge
prof. dr hab. Eulalia Skawińska
prof. dr hab. Dorota Witkowska
dr hab. Zbigniew Binderman, prof. SGGW
dr hab. Piotr Bórawski
dr hab. Alina Daniłowska, prof. SGGW
dr hab. Hanna Dudek, prof. SGGW
dr hab. Stanisław Gędek, prof. PRz
dr hab. Franciszek Kampka, prof. SGGW
dr hab. Sylwester Kozak
dr hab. Sebastian Majewski, prof. US
dr hab. Michał Majsterek, prof. UŁ
dr hab. Renata Marks-Bielska, prof. UWM
dr hab. Kamila Migdał-Najman
dr hab. inż. Andrzej Parzonko
dr hab. Katarzyna Perez prof. UEP
dr hab. Mariola Piłatowska, prof. UMK
dr hab. inż. Wojciech Pizło, prof. SGGW
dr hab. Izabella Sikorska-Wolak, prof. SGGW
dr hab. Tomasz Siudek, prof. SGGW
dr hab. Joanna Szwacka-Mokrzycka, prof. SGGW
dr hab. Elżbieta Szymańska
dr hab. Małgorzata Tarczyńska-Łuniewska, prof. US
dr hab. Adam Wąs
dr hab. Agnieszka Zakrzewska-Bielawska, prof. PŁ
dr hab. Anna Zamojska, prof. UG
dr hab. Aldona Zawojska
dr inż. Agnieszka Biernat-Jarka
dr inż. Roman Chorób
dr inż. Ewa Bąk-Filipek
dr inż. Zbigniew Floriańczyk
dr inż. Ewa Jaska
dr inż. Marzena Kacprzak
dr inż. Krzysztof Kompa
dr inż. Małgorzata Kosicka-Gębska
dr inż. Mariusz Maciejczak
dr inż. Anna Mazurkiewicz-Pizło
dr inż. Anna Milewska
dr inż. Dawid Olewnicki
dr inż. Agnieszka Parlińska
dr inż. Iwona Pomianek
dr inż. Joanna Rakowska
dr inż. Łukasz Satoła
dr inż. Aldona Skarżyńska
dr inż. Iwona Staniec
dr inż. Tomasz Wojewodzic
dr inż. Agnieszka Wojewódzka-Wiewiórska
dr Anetta Barska
dr Katarzyna Bień-Barkowska
dr Mariola Chrzanowska
dr Joanna Chudzian
dr Nina Drejerska
dr Ewa Dziawgo
dr Justyna Góral
dr Ireneusz Jaźwiński
dr Monika Kośko
dr Dorota Kozioł-Kaczorek
dr Franciszek Kubiczek
dr Stanisław Matusik
dr Aleksandra Matuszewska-Janica
dr Halina Powęska
dr Marcin Ratajczak
dr Michał Roman
dr Anna Rytko
dr Maciej Stawicki
dr Dariusz Strzębicki
dr Grzegorz Szafrański
dr Anna Świrska
dr Justyna Wiktorowicz
dr Joanna Wyrwa
Zane Bulderberga, Ph.D. (Latvia)
prof. Esteban Alfaro Cortes (Spain)
Carol J. Cumber, Ph.D. (USA)
Ing. Vladimir Hajko, Ph.D. (Czech)
dr hab. prof. Petro M. Hrytsiuk (Ukraine)
Ing. Svatopluk Kapounek, Ph.D. (Czech)
Zdenka Kadekova, Ph.D. (Slovakia)
Renata Kleinova, Ph.D. (Slovakia)
prof. Joseph Andrew Kuzilwa, Ph.D. (Tanzania)
Prof. Ing. Vera Majerova, Ph.D. (Czech)
Roelof Makken, Adjunct Professor (Canada)
dr Michael Ireland (UK)
Michael Miller, Ph.D. (USA)
prof. Marianne Nylandsted Larsen (Denmark)
dr hab. prof. Inna D. Łazaryszyna (Ukraine)
dr Olena Oliynyk (Ukraine)
Dina Popluga, Ph.D. (Latvia)
prof. dr hab. Baiba Rivza (Latvia)
Ing. Patrik Rovny, Ph.D. (Slovakia)
Jennifer Sesabo, Ph.D. (Tanzania)
Ing. Lubos Smutka, Ph.D. (Czech)
Ing. Martin Sirucek, Ph.D. (Czech)
Miklos Weisz, Ph.D. (Hungary)
Harun Ucak, Ph.D. (Turkey)
prof. Andra Zvirbule-Berzina (Latvia)
prof. dr Jan Żukovskis (Lituania)

ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

ACTA SCIENTIARUM POLONORUM *Oeconomia 14 (4) 2015, 5–12*

ROLE OF TECHNOLOGY TRANSFER MECHANISMS IN STIMULATING INNOVATION

Odiljon Abdurazzakov
Qafqaz University

Abstract. Innovation has gained importance in many societies and economies owing to its significant impact on efficiency and quality of life. The efforts of many countries to spur innovation demonstrate that innovation has gained momentum, especially in the past few decades. To improve the innovative capacity of countries and to ensure that society gets the maximum benefit of the research function of universities, it is important to transfer the knowledge generated by universities to industry through commercialization of research. This paper discusses technology transfer mechanisms which facilitate commercialization of research by transforming the research conducted by universities and research institutions and putting them in a form which is usable by technology seekers, such as SMEs, start--ups and the government. The article analyzes the effectiveness of the technology transfer mechanisms in stimulating innovation as well as the financial framework needed to facilitate innovation-based entrepreneurship.

Key words: innovation, technology transfer, research, start-up

INTRODUCTION

Creating innovation-based economy is central to the competitiveness of nations in the 21st century. Literature is in consensus on the role of academic/research institutions, the government and the business sector – the three elements also referred to as the "Triple Helix" – in stimulating innovative activities. Some researchers have also included the fourth leaf to the clover (called the "four-leaf clover" model), the fourth element being the organizations acting as catalysts of innovative activities [Guth and Cosnita 2010]. These catalysts, which include such mechanisms as technology transfer offices (TTOs), research parks, innovation centers, etc., facilitate the speed and effectiveness of the transfer of knowledge and technology from academic and research institutions to the industry.

Corresponding author: Odiljon Abdurazzakov, the Center for Entrepreneurship Development & Research, Qafqaz University, Khirdalan city, Hasan Aliyev str. 120, Baku, Absheron, AZ0101, Azerbaijan, e-mail: oabdurazzak@qu.edu.az

This article addresses how technology transfer mechanisms can stimulate innovative activities in a country. The second section of the paper discusses the open innovation model and its importance in stimulating innovation. The third section includes analysis of technology transfer mechanisms. The role of universities and research institutions in technology transfer process is discussed in the fourth section. The fifth section of the paper analyzes the importance of access to start-up financing. The conclusion is presented at the end.

OPEN INNOVATION MODEL

Because of its significant impact on efficiency and quality of life, innovation has gained importance in many societies and economies. The efforts of many countries to spur innovation demonstrate that innovation has gained momentum, especially in the past few decades. There are several indexes that measure innovation on a national level or globally. The Global Innovation Index measures the level of innovation in a country and is generated by Boston Consulting Group and The National Association of Manufacturers and the Manufacturing Institute. Other innovation indexes focus on a specific region, such as *Oslo Manual*, which focuses on North America, Europe and other rich regions around the world as well as Bogota Manual, which measures innovation in Latin America and Caribbean countries.

There are many definitions of innovation used in literature. Innovation refers to the creation of the new or the rearranging of the old in a new way. "Open innovation", coined by Henry Chesbrough, is a paradigm which assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology [Chesbrough 2003].

The central idea behind open innovation is that, in a world of widely distributed knowledge, companies cannot afford to rely entirely on their own research, but should instead buy or license processes or inventions (i.e. patents) from other entities. In addition, internal inventions not being used in a firm's business should be taken outside the company (e.g. through licensing, joint ventures or spin-offs) [Chesbrough 2003].

Core to innovation is the concept of technology transfer. The second section of the paper discusses the technology transfer model and the mechanisms of technology transfer.

TECHNOLOGY TRANSFER MECHANISMS

To ensure the maximum benefit of research function of universities to society, it is not enough to generate knowledge. It is also important to transfer that knowledge to industry through commercialization of research. The function of technology transfer takes place when the research conducted at universities is transferred to companies which use the findings of research and commercialize it. Universities, whether government funded or private, can increase their contribution when the knowledge they generate is transferred to industry and thereby ultimately benefit the society.

As illustrated in Figure 1, although large companies may have their own research and development (R&D) departments to generate the new technology they need, not all companies have enough resources to finance the R&D function. This is especially true for most of the small and medium enterprises (SMEs) and new business ventures (start-ups). According to the model of open innovation, these technology seekers can and should adopt ready technology produced by technology generators, such as universities, research institutions and R&D departments of large companies through a process called licensing in.

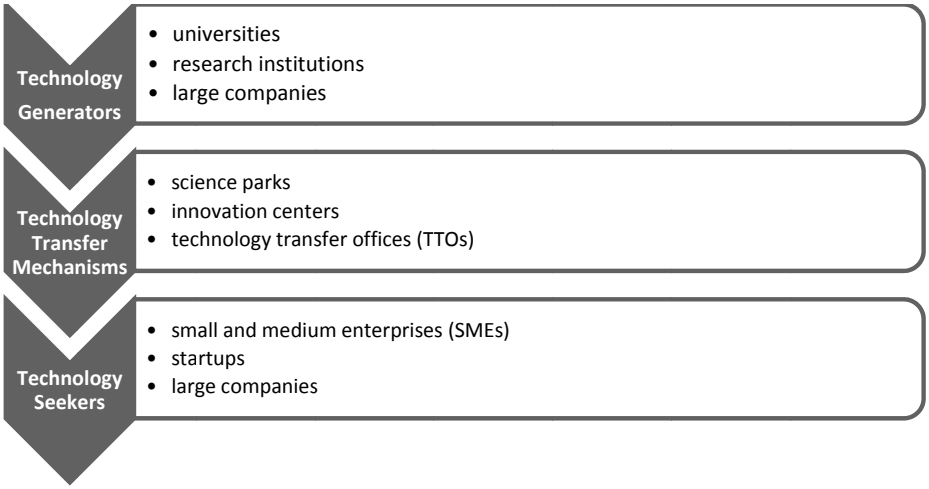

Fig. 1. The technology transfer model

Source: Own elaboration.

In order for technology seekers to more effectively benefit from the technology generated by universities and research institutions, there are technology transfer mechanisms which "translate" the research conducted by universities and research institutions and put them in a form which is usable by technology seekers. The mechanisms of technology transfer may be university-based entities or privately owned firms. The two common types are: (i) technology brokerage companies that facilitate an interaction between technology generators (universities and research institutions) and technology seekers (companies and SMEs), and (ii) technology transfer offices (TTOs) of universities which take the results of research conducted at the university and take steps to commercialize.

The suitability of technology for commercialization is measured by technology readiness level (TRL), which may range from 1 to 10. The higher the TRL, the more ready the technology is to be used by the industry. Technology transfer mechanisms, such as TTOs and science parks, help commercialize research by providing support for obtaining patents for the new technology generated at universities, and helping to find initial investment. These technology transfer mechanisms incubate new start-ups which are created on the basis of the research generated at universities and thus facilitate the commercialization of the research.

As Figure 2 shows, the findings of research at R&D departments of companies as well as research generated at universities need to be transferred from concept to product or process in order to qualify to be innovation. One of the challenges faced by the technology transfer mechanisms is deciding which research can be commercialized. Since the process of technological change takes time and financial resources, it is very important to choose a research which can generate a high return. Skills of technology transfer offices are very crucial at this stage – they need experts who have an understanding of the market as well as skilled engineers who understand the process of turning new ideas (invention) into products (innovation). Diffusion refers to scaling the new product to a larger market, where returns would be higher.

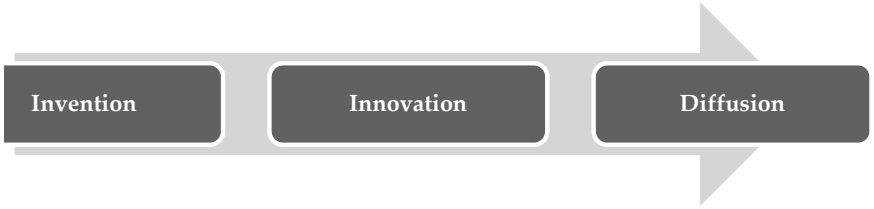

Fig. 2. Original model of the three phases of the process of technological change
Source: Own elaboration.

ROLE OF UNIVERSITIES AND RESEARCH INSTITUTIONS IN TECHNOLOGY TRANSFER

Universities and other higher education institutions (HEIs) are an important source of new scientific knowledge. Industry can gain access to this knowledge or resource by developing formal and informal links with higher education institutes [OECD 1981, 1993]. The university and industry (U-I) relationship is not new, but it has become more formal, frequent and planned, mainly since 1970s. It has also aroused growing interest by governments and policy makers, from both developed and developing countries, who still regard it as an under-utilized scientific-technological resource. The implicit argument of this reasoning is that universities, as generators and repositories of scientific knowledge and expertise, could transfer, through articulated mechanisms, at least part of such a stock to companies [Vedovello 1997].

In addition to technology transfer offices (TTOs), there are other mechanisms used as channels for transferring results of research carried out at universities to industry. These mechanisms are referred to differently in different parts of the world: research parks in the USA, science parks in the UK etc. Other names include technology parks (technoparks), technology incubation centers, technopolis, etc. Despite differences in the names, they serve the same purpose – to facilitate the commercialization of the results of the research carried out at universities.

Research parks (or technology parks) are widely accepted as one of the most effective mechanisms for transfer of knowledge from university to industry. Westhead [1997] claims that science parks reflect an assumption that technological innovation stems from

scientific research and that parks can provide the catalytic incubator environment for the transformation of "pure" research into production.

According to Felsenstein [1994], many countries have established technoparks with two main objectives. The first objective of a science park is to be a seedbed and an enclave for technology, and "to play an incubator role, nurturing the development and growth of new, small, high-tech firms, facilitating the transfer of university know-how to tenant companies, encouraging the development of faculty-based spin-offs and stimulating the development of innovative products and processes". The second objective is to act as a catalyst for regional economic development or revitalization and to promote economic growth.

A study was conducted in Spain which analyzed the factors that made some universities more successful than others in technology transfer, mechanism used to generate spin--offs. The study which included 47 public universities analyzed the impact of the nature of university research, the amount of research funding and the research quality of the academic staff on the number of spin-offs generated by the universities. The findings of the research indicated that creation of research based spin-offs generated by universities depend on such factors as the availability of incubation services and the focus of research. The universities with strong focus on engineering and life sciences tend to create more spin-offs because both applied nature and the technology regime of their research output make it more easily marketable. With regard to funding, although total funding does not play a key role in the spin-offs activity, the amount of industry-funded research is positively related to the production of spin-offs [Pazos et al. 2012].

Despite the belief that science parks are effective seedbeds for innovation-based new start-ups, the research on the impact of research parks on the creation of new technology-based firms (NTBF) is not in consensus. Effectiveness of the vehicles of technology transfer is impacted by resources possessed by these mechanisms. The four types of resources mentioned in literature as conditions for effective transfer of knowledge and technology from universities to industry: institutional resources, human capital, financial resources and commercial resources [O'Shea et al. 2005].

Another key factor that impacts the creation of innovation based start-ups is the availability and ease of access to start-up financing. Traditionally, it has been hard to attract debt financing due to high level of risk associated with start-ups. The other alternative – equity investments are also not very easy to reach. Therefore, some governments have created special grant programs to stimulate the creation of new technology-based start--ups. The next section discusses different types of financing available for innovation based new ventures.

ROLE OF START-UP FINANCING IN STIMULATING INNOVATION-BASED ENTREPRENEURSHIP

Financing new ventures created through commercialization of research have always been challenging. The main reasons include absence of credit history, lack of steady cash flow, and significantly high risks associated with new ventures. Generally, for financing start-ups there are available equity and debt sources.

Sources of equity financing

Equity financing is very important in the process of commercializing research due to accessibility. Unlike commercial banks, equity investors are less risk averse and therefore suit well for new technology based start-ups which involve significantly high levels of risk. The major disadvantage of equity financing is that founders of the start-up usually have to relinquish part of ownership and give up partial control. The three main types of equity financing available for start-ups include *business angels*, *venture capitals* (VC) and *initial public offerings* (IPO).

Business angels are experienced and wealthy individuals who invest their personal capital in start-ups. Angel investors generally spend between $10 and $500 thousand in a single company and are looking for companies that have the potential to grow 30 to 40% per year before they are acquired or go public [Gimmon et al. 2011]. Most cited cases are investment received by Apple from Mike Markkula, former executive at Intel, who invested $91 thousand in 1977 and personally guaranteed another $250 thousand in credit lines. When Apple went public in 1980, his stock in the company was worth more than $150 million [Thoma 2009].

In addition to funding, angel investors also contribute with their rich experience and network. This was the case with angel investor of Google Andy Bechtolsheim – cofounder of Sun Microsystems, who invested $100 thousand in 1998 after its cofounders Larry Page and Sergey Brin showed him the early version of Google's search engine [Batelle 2005].

Venture capital is an investment by venture capitalist (VC) firms. They are typically formed as limited partners who raise funds in order to invest them into promising high--technology-based start-ups. Unlike angel investors who invest in earlier stages, VCs come in later stages. There are multiple rounds of venture capital funding [Barringer and Ireland 2012] as described in Table 1.

Table 1. Stages (rounds) of venture capital funding

Stage or Round	Purpose of funding
Seed funding	Investment made very early in a ventures' life to fund the development of a prototype and feasibility analysis
Start-up funding	Investment made to firms exhibiting few if any commercial sales but in which product development and market research are complete
First stage funding	Funding that occurs when the firm has started commercial production and sales but requires financing to ramp up its production capacity
Second stage funding	Funding that occurs when a firm is successfully selling a product but needs to expand both its capacity and its markets
Mezzanine financing	Investment made in a firm to provide for further expansion or to bridge its financing needs before launching an IPO or before a buyout
Buyout funding	Funding provided to help one company acquire another

Source: Own elaboration.

Initial public offering (IPO) is the initial sale of a firm's stocks to public. Angel investors and VCs reap returns on their investment during IPOs. By selling stocks, the firms raise equity capital which is important to finance current and future operations.

Sources of debt financing

Although there are various forms of debt financing the most popular ones for start--ups are single-purpose loan and line of credit. Other types include peer-to-peer lending, vendor credit and factoring – a transaction where one firms sells its accounts receivables to a third party in exchange for cash.

Unlike equity financing, where the new venture does not need to pay back the loan, it debt financing, new ventures are usually required to pay back the principal amount and interest. This is a major disadvantage for new start-ups which are usually in dire need of cash. Advantage of debt financing is that the new venture does not share ownership with other parties.

CONCLUSIONS

Many developing nations around the world which are investing in stimulating their innovation potential and developing their national innovation policy, cannot afford to miscalculate the importance of technology transfer mechanisms. In addition to the other three leafs of the four-leaf clover – the industry, the government, and academic institutions, the technology transfer mechanisms serve irreplaceable role of a bridge between technology generators and technology seekers. While there are multiple mechanisms which serve as catalyst to transfer knowledge and technology from universities to industry, the literature is not in consensus regarding their role.

Besides the establishment of the four elements mentioned above, it is vital to ensure that the new ventures, which are formed as a result of commercializing research generated by technology generators, have access to startup financing so they can transform into a sustainable business. Due to the risk-averse nature of debt financiers, such as commercial banks, innovation based startups usually target equity financiers including angel investors and venture capitals.

Finally, role of universities and research institutes are significant in creating a national innovation system. Since not all businesses have capacity to generate technology, research produced by universities serve an important role as a source of knowledge. Many universities in developed countries have established research parks (or technology parks), a trend which is being imitated by universities in developing countries. The role of these mechanisms is to bridge universities to industry by translating the research conducted by universities and research institutions and put them in a form which is usable by technology seekers.

REFERENCES

Barringer, B., Ireland, R. (2012). Entrepreneurship, Successfully Launching New Ventures. Fourth Edition. Pearson. New York.

Battelle, J. (2005). The Search: How Google and its rivals rewrote the rules of business and transformed our culture. Portfolio, Penguin Group, New York.

Chesbrough, H.W. (2003). The era of open innovation. MIT Sloan Management Review, 44 (3), 35–41.

Felsenstein, D. (1994). University-related science parks – "seedbeds" or "enclaves" of innovation? Technovation, 14 (2), 93–110.
Gimmon, E., Yitshaki, R., Benjamin, E., Khavul, S. (2011). Divergent Views of Venture Capitalists and Entrepreneurs on Strategic Change in New Ventures. Strategic Change, 20 (3), 85–99.
Guth, M., Cosnita, D. (2010). Clusters and potential clusters in Romania – A mapping exercise. Available at http://www.minind.ro/presa_2010/iulie/MappingReport_230710.pdf.
OECD (1981). The Future of University Research. Organization for Economic Co-Operation and Development, Paris.
OECD (1993). Small and Medium-sized Enterprises: Technology and Competitiveness. Organization for Economic Co-Operation and Development, Paris.
O'Shea, R., Allen T., Chevalier, A., Roche, F. (2005). Entrepreneurial orientation, technology transfer and spin-off performance of U.S. universities. Research Policy, 34, 994–1009.
Pazos, D., Lopez S., Gonzalez, L., Sandias, A. (2012). A resource-based view of university spin-off actvitity: New evidence from the Spanish case. Revista Europa de Direccion y Economia de la Empresa, 21, 255–265.
Thoma, G. (2009). Striving for a Large Market: Evidence from a General Purpose Technology in Action. Industrial and Corporate Change, 18, 107–138.
Vedovello, C. (1997). Science parks and university-industry interactions: Geographical proximity between the agents as a driving force. Technovation, 17 (9), 491–502.
Westhead, P. (1997). R&D "inputs" and "outputs" of technology-based firms located on and off Science Parks. R&D Management, 27 (1), 45–62.

ROLA MECHANIZMU TRANSFERU TECHNOLOGII W STYMULOWANIU INNOWACJI

Streszczenie. Innowacje przyciągają uwagę wielu społeczeństw z powodu znaczącego wpływu na efektywność i jakość życia. Wysiłek wielu państw aby zachęcić do innowacji sprawił, że zyskały one impet w ostatnich dekadach. Aby poprawić zdolność absorpcji innowacji i zapewnić społeczeństwu maksimum korzyści z badań uczelni, ważne jest, żeby transfer wiedzy przez nie generowany do przemysłu odbywał się przez komercjalizację badań. W artykule omówiono mechanizm transferu technologii, który wspomaga komercjalizację badań uniwersytetów i instytutów badawczych poprzez nadanie im formy, która byłaby użyteczna dla podmiotów poszukujących innowacyjnych technologii, takich jak: małe i średnie przedsiębiorstwa, przedsięwzięcia start-up i rząd. W artykule analizuje się efektywność transferu technologii w stymulującą innowację, jak również finansowe warunki wspomagające przedsiębiorczość bazującą na innowacjach.

Słowa kluczowe: innowacje, transfer technologii, badania, start-up

Accepted for print: 06.11.2015

For citation: Abdurazzakov O. (2015). Role of technology transfer mechanisms in stimulating innovation. Acta Sci. Pol., Oeconomia, 14 (4), 5–12.

ACTA SCIENTIARUM POLONORUM
Oeconomia 14 (4) 2015, 13–23

ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

IFRS ADOPTION AND ITS IMPLEMENTATIONS IN AZERBAIJAN

Etibar Hüseynli, Nərmin Balayeva, Rübabə Şirinova, Aygün Əsgərova
Qafqaz University

Abstract. The purpose of the study is to illustrate the application of International Financial Reporting Standards in Azerbaijan and why it is essential to adopt IFRS. All companies in the European Union countries and other ones, as well as Azerbaijan, since January 2008 are required to prepare financial statements in compliance with IFRS. We also find that the transition to IFRS had a significant effect on increasing transparency and effectiveness on reporting the financial statements. Our research seeks to examine how the transition to IFRS will happen or do the firms and banks in Azerbaijan have the incentives to apply IFRS. Our analysis support that the adoption of IFRS in Azerbaijan is helpful to economic development and financial system stability with positive economic effects.

Key words: Financial reporting, International Financial Reporting Standards (IFRS), implications of IFRS in Azerbaijan, national reporting standards, hypothesis development

INTRODUCTION

IFRS is the collection of financial reporting standards developed by the International Accounting Standards Board. The purpose of IFRS is to provide "a single set of high quality, global accounting standards that require transparent and comparable information in general purpose financial statements". Today, IFRS standards have been implemented or permitted in almost 100 countries worldwide. By adopting IFRS, a business can present its financial statements on the same basis as its foreign competitors, making comparisons easier. Most countries have adopted the IFRS. This adoption differs in terms of method of implementation from one country to another. In fact, the adoption of IFRS in the world

Corresponding author: Etibar Hüseynli, Qafqaz University, Department of Business Administration, e-mail: ehuseynli@qu.edu.az

by countries to listed companies can be classified in accordance to its level of compliance with the IFRS issued by the IASB into four methods: "due process", "standard by standard", "optional" and "not fully converged".

As we mentioned before International Financial Reporting Standards (IFRS) are a set of accounting standards developed by the International Accounting Standards Board (IASB) that is becoming the global standard for the preparation of public company financial statements. The IASB is an independent accounting standard-setting body, based in London. It consists of 15 members from nine countries, including the United States. It is funded by contributions from major accounting firms, private financial institutions and industrial companies, central and development banks, national funding regimes, and other international and professional organizations throughout the world. Approximately 120 nations and reporting jurisdictions permit or require IFRS for domestic-listed companies, although approximately 90 countries have fully conformed with IFRS as broadcasted by the IASB and include a statement acknowledging such conformity in audit reports. Other countries, including Canada and Korea, are expected to transition to IFRS by 2011. Mexico will require IFRS for all listed companies starting in 2012. Japan has introduced a roadmap for adoption that it will decide on in 2012 (with a proposed adoption date of 2015 or 2016) and is permitting certain qualifying domestic companies to apply IFRS from fiscal years ending on or after 31 March 2010. Still other countries have plans to converge their national standards with IFRS. Furthermore, as advantages we can say that, the companies with subsidiaries in countries that require or permit IFRS may be able to use one accounting language company-wide. Companies also may need to convert to IFRS if they are a subsidiary of a foreign company that must use IFRS, or if they have a foreign investor that must use IFRS. Companies may also benefit by using IFRS if they wish to raise capital abroad.

Although the number of countries adopting IFRS is quite large, there are differences in choices of implementation method. Indeed, the policy of implementation of IFRS around the world can be categorized into four principal methods with different degrees of compliance with the IFRS issued by the IASB. Thus, the European Union has therefore chosen to retain some control and to apply for these companies only the standards adopted by the Union. Other countries such as South Africa and Israel have opted for a direct application of the standards issued by the IASB. China has opted for an incomplete convergence while Australia has chosen to completely converge its standards to IFRS.

There are several choices for the implementation of IFRS in terms of both methods and policies. According to the study, a body of accounting norms can be implemented into a country by several methods. Indeed, the regulator of country can adopt the standard setter's process. Through this method, which is simple to implement, the regulator of a country gives an independent accounting standard setter the mission of developing accounting standards for these companies. Concerned companies therefore automatically apply the standards issued by the standard setter. Each accounting standard issued has a legal force allowing its application without passing through a regulatory approval. Also the regulator may choose to rubber stamping each standard. Through this process, the regulator adopts all standards published by the standard setter and transfers them automatically in its legal arsenal. No standard is changed or modified. The standards are

adopted by the accounting framework and applied quickly. Likewise, the regulator can endorse the standards. By this method it can adopt or deletes norms. Only the adopted standards are applicable by the concerned entities. The last method for implementing accounting standards is the convergence. It can be a full or partial convergence. The full convergence is based on the execution of a compliance process of all accounting standards with those of the target repository. The goal is to have at the end of the convergence similar accounting. The incomplete convergence is a compliance process of certain norms while the others will be conserved in their actual form.

Ranking of these implementation methods and have given examples of countries adopting them. There is a classification of these methods have assigned a name for each class and given examples of countries applying them. The first method called "adopting the process" has been chosen in South Africa and Israel and the second method named "standard by standard" in its two first levels "adoption as issued by the IASB" implemented in Canada and "fully converged with IFRS" in Australia; those standards, according to the authors, are the most compliant with IFRS which are issued by the IASB. The third level of the "standard by standard" method named "Adoption as issued by the IASB with deletions" implemented in the European Union and the third implementation method called "optional" that are chosen in Switzerland are considered as possibly conform to the IFRS. The fourth method called "not fully converged" is applied in China and it is considered as compliant "unlikely" with the IFRS as issued by the IASB.

IMPLEMENTATIONS OF IFRS TO AZERBAIJAN

To make international comparisons is easy by IFRS, but actually this is difficult because, to a large extent, each country has its own set of rules. For example, US GAAP is different from Azerbaijan GAAP. Coordinating accounting standards across the globe is an ongoing process in the international community. So, our purpose of writing this paper is to give information about IFRS adoption in the world and mainly in Azerbaijan. The Republic of Azerbaijan Accounting Law from 2004 states that IFRS are adopted in their entirety for use by credit organizations, insurance companies, investment funds, non-state (private) social funds, entities with securities traded on the stock exchange, and commercial organizations exceeding specific levels concerning revenue, number and total balance sheet. In addition, any commercial organization (other than a very small one) that has one or more subsidiaries must prepare consolidated financial statements in accordance with IFRS. The Accounting law also states that any modifications to these standards can only be made by the IASB and that such modifications are effective when they are officially adopted by the IASB. Introducing the international accounting standards is one of the requirements of Azerbaijan's integration into the global community. We must speak with the international community in the same language of accounting.

For provide policy makers with the information they need for implementing new accounting policies and corporate financial reporting in Azerbaijan, high quality and transparent financial information or IFRS is important for Azerbaijan.

There are several steps of importance of IFRS. These standards:

- reflect economic reality;
- are applied consistently;
- are complete and supported by extensive interpretation knowledge;
- provide for complete disclosures;
- support strong corporate governance;
- are internationally understood by all stakeholders.

So high-quality financial reporting will strengthen the country's financial architecture and reduce the risk of financial crises and scandals, the consequences of which have a harmful impact as evidenced around the world. High quality financial reporting not only improves financial transparency and accountability but also plays a crucial role in ensuring good governance and underpinning the growth of a market economy. At the same time, IFRS is the appropriate framework for public interest entities. The adoption of IFRS in Azerbaijan is helpful to economic development and financial system stability with positive economic effects on budgetary burden, cost of capital and availability of domestic and foreign savings.

There are also challenges of implementing IFRS:

- Thus, IFRS are mainly designed for public interest entities (PIEs) and other large companies and generally not geared to small- and medium-sized entities (SMEs);
- Adoption of IFRS represents a cultural change (previously, financial statements were only done for tax purposes, now they are seriously looked at by investors and other stakeholders);
- Adoption of IFRS is a major investment in time, resources and technical expertise;
- Adoption of IFRS has significant impact on taxation if used as tax basis;
- Embedding IFRS is not merely a technical exercise, it involves the reordering of information and rearrangement of the financial statements;
- The adoption of IFRS is not only about the application of accounting policies. IFRS requires the adoption of an entirely different system of performance measurement and communication with external stakeholders, that is why there is also some practical challenges: staff expertise and knowledge – need for IFRS qualified local accountants;
- Analysis of accounting policies – IFRS chart of accounts for large state enterprises;
- IFRS transition issues for most of the state-owned enterprises (consolidated financial statement, intercompany transactions, related party disclosures, etc.);
- Impact on accounting and reporting systems, including enhancement of IT systems;
- Data collection to produce a set of IFRS compliant financial information.

All entities registered in Azerbaijan are required to maintain their books and records on the territory of Azerbaijan in local currency and in accordance with the recently introduced National Accounting Standards (NAS), which have been prepared on the basis of IFRS. Registered commercial companies were required to start preparing their financial statements in accordance with the National Accounting Standards for Commercial Organizations or IFRS. One notable difference between NAS and IFRS is the use of a mandatory chart of accounts. The recently introduced Accounting Law also stipulates

that all significant entities, including credit institutions, insurance companies, investment funds and commercial organizations, which meet certain criteria, will be subject to IFRS. Others will have to follow NAS or IFRS. Small private businesses registered as simplified taxpayers are not obliged to keep very detailed accounts and are therefore not required to follow NAS or IFRS.

In amending its Accounting Law, Azerbaijan has recognized the importance of high quality and transparent financial reporting for the development of economic growth. However actual implementation of the new Accounting Law remains a challenge as it is in all countries implementing new financial reporting system and particularly IFRS.

The Republic of Azerbaijan Accounting Law from 2004 requires IFRS for the following types of entities: credit organizations; insurance companies; investment funds; non-state (private) social funds; entities with securities traded on the stock exchange; and commercial organizations that on the date, to which the financial statements are prepared, exceed two of the thresholds (for annual revenue, average number of employees during the financial year and total balance sheet) in an amount determined by the relevant executive authority. In addition, any commercial organization (other than a very small one) that has one or more subsidiaries must prepare consolidated financial statements in accordance with IFRS.

In the past, financial statements were the responsibility of the chief accountant (even in Europe). Now this is become a primary focus of audit committee and Board. Financial reporting is a key piece of a larger puzzle. Parallel reforms and particularly enacting implementation legislation are required to support the implementation of IFRS, including: The legal environment should be adjusted to increase responsibility of the executives for the financial reporting; Audit requirements should be adjusted accordingly and brought up to an international benchmark level; Stock exchange regulators should release rules and regulations for initial listing and fair trade; Adoption of IFRS for PIEs and the endorsement process of new/changed standards should be embedded into the legal system; Translating and ongoing updating IFRS into Azerbaijani is essential.

Financial reporting is of primary importance but at the same time this is not an end in itself. The objective is to strenghten country's financial system and to develop the local economy.

HYPOTHESIS

As we mentioned above the aim that we made a decision to write this article is to explore implications of IFRS in Azerbaijan. For this reason we made our hypotheses:

- H1: Under IFRS Azerbaijani accountants are more likely to recognize provisions than other countries accountant accountants.
- H2: Firm which use IFRS are more likely to increase stability of their financial system.
- H3: Under IFRS Azerbaijani accountants are less likely to disclose contingent assets in the notes than other countries' accountants.
- H4: Banks or firms rarely change their accounting system to IFRS or reverse.

DATA METHODOLOGY AND SAMPLE

To make explanations of such hypotheses we conduct a survey. We made questionnaire and asked them to evaluate those understanding of IFRS. Questionnaire was written in English and Azerbaijani. We collect responses of questions for hypotheses test and confidence interval.

The survey was conducted during one week. In Azerbaijan we sent survey to some banks and firms via e-mail with a request for completion of the questions that was to be accused online. Accountants and auditors of firms answered questions. We also made letters for request to answer these questions. All of these people included sample. This preparation is important in order to get a sufficient sample size in Azerbaijan. Total 44 banks, 25 of them completed questionnaire.

In order to find implications of IFRS in Azerbaijan, we conduct a survey that consist of seven questions which are related to our research. We tried to examine which accounting or financial reporting standards do the banks and the firms in Azerbaijan currently use, how frequently do they change their reporting standards, are Azerbaijan accountants more likely to recognize provisions of IFRS, what they can achieve mostly by using IFRS, are Azerbaijani accountants less likely to disclose contingent assets in their notes, how much is the cost of using IFRS and when they try to affect specific provisions of a new international standard, how frequently they can succeed (Table 1).

HYPOTHESES TEST

We take $\alpha = 0.05$, $n = 25$ for all cases. H0 : $\pi = 0.50$ (the proportion of IFRS used by Azerbaijani banks is 0.50). H1: $\pi \neq 0.50$ (the proportion of IFRS use by Azerbaijani banks is not 0.50). We reject H0 if $Z < -1.96$ or if $Z > +1.96$. Otherwise do not reject H0.

Firstly we calculate Z value, which is –1.

We do not reject H0 because –1 fall into between –1.96 and 1.96 (non-rejection region). In this order we can calculate all hypotheses for each questions. Firms use GAAP $p = 9/25$ α (level of significance), n (sample size). We calculate the same way and answer $Z = 1.4$. This is also fall into interval that we mention above. Firms or banks that use others for their accounting system $p = 6/25$, $Z = -2.2$. We reject H0 because $Z < -1.96$.

For evaluating H1 we should do hypotheses test. Again we take $n = 25$, $\alpha = 0.05$, $p = 13/25$. H0: $\pi = 0.50$ (the proportion of Azerbaijani accountants are more likely to recognize provisions than other countries accountant accountants is 0.50). H1 (the proportion of Azerbaijani accountants are more likely to recognize provisions than other countries accountant accountants is not 0.50).

Z is between –1.96 and 1.96 (non-rejection region), that is why we do not reject H0.

We also can evaluate accuracy of H2. For this hypotheses H0 $\pi = 0.50$ (the proportion of using IFRS to increase stability of their financial system is 0.50).

H1 $\pi \neq 0.50$ (the proportion of using IFRS to increase stability of their financial system is not 0.50). We do not reject null hypotheses because Z is between –1.96 and 1.96.

Table 1. Characteristics of survey results

	A	B	C	D	E	F	G	H	I
1	Q1	Q2	Q3	Q4	Q5	Q6	Q7		
2	IFRS	often	yes	Increasing stability if capital markets	yes	35000	Often		
3	Az GAAP	sometimes	no	Improving transparancy and usefulne	mostly	2000	Rarely		
4	IFRS	rarely	yes	Improving transparancy and usefulne	no	3000	Rarely		
5	IFRS	sometimes	yes	Improving transparancy and usefulne	yes	3500	Rarely		
6	IFRS	sometimes	yes	Increasing stability if capital markets	yes	4000	Often		
7	Az GAAP	often	no	Increasing stability if capital markets	no	10000	Often		
8	IFRS	sometimes	yes	Improving transparancy and usefulne	no	2500	Often		
9	Other standards	rarely	no	Improving transparancy and usefulne	yes	7000	Sometimes		
10	Az GAAP	rarely	yes	Increasing stability if capital markets	mostly	25000	Sometimes		
11	Other standards	sometimes	no	Improving transparancy and usefulne	yes	25000	Rarely		
12	Other. S	often	yes	Increasing stability if capital markets	mostly	3000	Often		
13	IFRS	rarely	yes	Improving transparancy and usefulln	yes	8500	Sometimes	mean	8548
14	GAAP	sometimes	no	Increasing stability if capital markets	no	4500	Rarely	standart. D	8327.82084
15	IFRS	sometimes	yes	Enchaging efficiency	no	15000	Rarely		
16	GAAP	often	no	Providing level playing inter.for.comp	mostly	6500	Often		
17	Other. S	rarely	yes	Improving transparency and usefulne	yes	7000	Sometimes		
18	GAAP	sometimes	no	Increasing stability if capital markets	no	1500	Sometimes		
19	GAAP	often	no	Increasing stability if capital markets	no	3000	Often		
20	IFRS	often	no	Enchaging efficiency	mostly	2500	Rarely		
21	IFRS	rarely	yes	Providing level playing inter.for.comp	yes	12000	Often		
22	IFRS	rarely	yes	Providing level playing inter.for.comp	yes	6500	Often		
23	GAAP	rarely	no	Improving transparanccy	no	9000	Sometimes		
24	Other.S	sometimes	yes	Increasing stability if capital markets	mostly	8200	Sometimes		
25	GAAP	often	no	Increasing stability if capital markets	mostly	3200	Often		
26	Other.S	rarely	NO	Enchaging efficiency	mostly	6300	Sometimes		

Source: Own calculations.

For H3: $p = 9/25$, H0 $\pi = 0.50$ (the proportion of under IFRS Azerbaijani accountants are less likely to disclose contingent assets in the notes than other countries' accountants is 0.50), H1 $\pi \neq 0.50$. As a result of evaluation $Z = -1.8$, and we do not reject it means the proportion of under IFRS Azerbaijani accountants are less likely to disclose contingent assets in the notes than other countries' accountants is 0.50.

At last H4: $p = 10/25$, H0 $\pi = 0.50$ (the proportion of banks or firms rarely change their accounting system to IFRS or reverse is 0.50). H1 (the proportion of banks or firms rarely change their accounting system to IFRS or reverse is not 0.50). We evaluate Z value. $Z = -1$ and we do not reject H0 because Z is between –1.96 and 1.96 (which is non-rejection region).

Results of these hypothesis is consistence with our prediction. Also we can take another hypothesis that H0: $\mu = 7{,}590$, H1: $\mu \neq 7{,}590$. Again $n = 25$, $\alpha = 0.05$, $\sigma = 8{,}327.8$, $X = 8{,}548$. $Z = 0.5$. This Z value is consistent with our prediction because 0.5 is fall into non-rejection region.

CONFIDENCE INTERVAL

A confidence interval estimate is a range of numbers, called "an interval", constructed around the point estimate. The confidence interval is constructed such that the probability the population parameter is located somewhere within the interval is known. We take 95% confidence interval for evaluating confidence interval of using IFRS in Azerbaijan. In order to find implications of IFRS in Azerbaijan, we conduct a survey that we mentioned above.

Accordingly to these questions we evaluate confidence interval of each questions. For this, we use equations which are called "confidence interval estimate for the mean and confidence interval estimate for the proportion" these are shown below. Also we take sample size ($n = 25$), and this is data that we evaluate mean and standard deviation on MS Excel.

We can evaluate confidence interval for banks which use IFRS. Sample size is 25, proportion ($p = X/n$, X is number of items in the sample having the characteristics of interest, n is sample size) is 10 / 25. It means, 95% confidence interval that the using IFRS by banks in their accounting system is between 21 and 59%. Others also evaluates like this (Table 2). The cost of banks that they using IFRS is $N = 25$. It means that 95% confidence interval that the mean amount of banks using money for their accounting system is somewhere between 5,883.2 and 11,212.8.

After choosing our hypothesis and conducting survey we evaluated our confidence interval for reaching conclusions for banks in the Azerbaijan. According to our results we found with 95% confidence interval that the banks using IFRS in their accounting systems is between 21 and 59%. And the banks which often change their accounting systems is between 11 and 45%. And also our confidence interval showed that the banks in which IFRS is likely to increase stability is between 21 and 59%. The accountants in Azerbaijan, who disclose contingent assets in the notes, is between 17 and 55% confidence interval, and when trying to effect the specific provisions of a new international standard the confidence interval of often succeeding is between 29 and 67%.

Table 2. Estimation of confidence intervals

×	Proportion	Size	*Z* value
IFRS	$0.21 \leq p \leq 0.59$	25	±1.96
GAAP	$0.17 \leq p \leq 0.55$	25	±1.96
Others	$0.04 \leq p \leq 0.44$	25	±1.96
Changing current account. often	$0.11 \leq p \leq 0.45$	25	±1.96
Changing current account sometimes	$0.17 \leq p \leq 0.55$	25	±1.96
Changing current account rarely	$0.21 \leq p \leq 0.59$	25	±1.96
IFRS increasing stability	$0.21 \leq p \leq 0.59$	25	±1.96
IFRS improving transparency	$0.17 \leq p \leq 0.55$	25	±1.96
IFRS providing a level playing field	$0.02 \leq p \leq 0.22$	25	±1.96
Enhancing market efficiency	$0.02 \leq p \leq 0.22$	25	±1.96
Recognize provisions YES	$0.33 \leq p \leq 0.71$	25	±1.96
Recognize provisions NO	$0.29 \leq p \leq 0.67$	25	±1.96
Disclose cont. assets in notes YES	$0.17 \leq p \leq 0.55$	25	±1.96
Disclose cont. assets in notes NO	$0.14 \leq p \leq 0.5$	25	±1.96
Disclose cont. assets in notes MOSTLY	$0.14 \leq p \leq 0.5$	25	±1.96
Succeed new IS often	$0.29 \leq p \leq 0.67$	25	±1.96
Succeed new IS sometimes	$0.21 \leq p \leq 0.59$	25	±1.96
Succeed new IS rarely	$0.02 \leq p \leq 0.22$	25	±1.96

Source: Own calculations.

CONCLUSIONS

After controlling for firms and corporate governance characteristics we find strong evidence for supporting the positive role of IFRS adoption in Azerbaijani firms and banks. Accounting standards such as IFRS are important because they provide backbone for integrity and trust in financial markets. Now IFRS is in use throughout Europe and being adopted increasingly by countries around the world.

In this article we explored implications of IFRS in Azerbaijan and we reached some conclusions. The firms which use IFRS when reporting their financial statements are more likely to be transparent and can easily control their stability.

As growing number of companies in Azerbaijan and adopting IFRS, Azerbaijan accountants tend to recognize IFRS provisions and also they are less likely to disclose contingent assets in the notes.

Using a sample of 25 banks we found that the banks and the firms in Azerbaijan are less likely to change traditional financial reporting systems. Because they will need to develop new accounting policies and procedures, exploring and analyzing the gaps between the information currently available and that needed for their IFRS audit. Moving to IFRS requires significant effort and affects not only numbers, but

the systems, processes and data supporting the financial reporting process. Companies need an efficient, IFRS-compliant process for managing their financial statements. Using of IFRS will reduce the complexity that exists in financial reporting and also it will increase transparency in reporting the company's financial situation. Under IFRS, some believe that transactions can be reported more on the basis of the substance of the transaction rather than the need to follow complex reporting rules. Using IFRS can also lead to achieving enhance market efficiency.

Our research provided information that for developing IFRS in Azerbaijan our accountants or other professionals need to understand international regulation structure in field of financial reporting, application of appropriate international financial accounting and financial reporting standards in real life situations, preparation of financial reporting in accordance with IFRS, to acquire knowledge of applying practically the National Accounting Standards. Our people will need support throughout the transition period, to help them understand the underlying theory behind IFRS, the practical implications of transformation and to help them consolidate their learning. Our objective is to provide policy makers with the information they need for implementing new accounting policies and corporate financial reporting in Azerbaijan.

REFERENCES

André, P., Filipp, A. (2012). Accounting Conservatism in Europe and the Impact of Mandatory IFRS Adoption.

Berenson, M.L., Levine, D.M., Szabet, K.A. (2012). Basic Business Statistics. 12th edn. Pearson – Prentice Hall, New York.

The Impact of IFRS on Accounting Quality in a Regulated Market. Chunhiu Liu University of Winnipeg, Canada.

Jeanjean, T., Ding, Y., Stolowy, H. (2005). Why do national reporting standards differ from IAS? The role of culture. The International Journal of Accounting, 40 (4), 325–350.

Law of Azerbaijan Republic. Accounting Law from 29 June 2004. 716-IIQ.

Tiemann, T.K. (2010). Introductory Business Statistics. Retrieved from https// dl.dropboxusercontent.com/u/31779972/IntroductoryBusinessStatistics.pdf.

Wehrfritz, M., Haller, A. (2014). National influence on the application of IFRS: Interpretations and accounting estimates by German and British accountants. Advances in Accounting, 30 (1), 196–208.

ADAPTACJA I WDROŻENIE IFRS W AZERBEJDŻANIE

Streszczenie. Celem opracowania jest zaprezentowanie Międzynarodowych Standardów Sprawozdawczości Finansowej (IFRS), których zasady od 2008 roku obowiązują przedsiębiorstwa w Unii Europejskiej i Azerbejdżanie. Z przeprowadzonej analizy wynika, że wdrożenie tych standardów przyczyniło się znacząco do zwiększenia przejrzystości i efektywności sprawozdań finansowych. W artykule autorzy starali się określić, czy istnieją bodźce dla przedsiębiorstw i banków w Azerbejdżanie do wdrożenia standardów. Z badań wynika, że wdrożenie zasad IFRS jest pomocne w utrzymaniu stabilności systemu finansowego, a także ma pozytywne efekty ekonomiczne.

Słowa kluczowe: raporty finansowe, Międzynarodowe Standardy Sprawozdawczości Finansowej (IFRS), zastosowanie IFRS w Azerbejdżanie, narodowe standardy sprawozdawczości, badanie hipotez

Accepted for print: 06.11.2015

For citation: Hüseynli E., Balayeva N., Şirinova R., Əsgərova A. (2015). IFRS adoption and its implementations in Azerbaijan. Acta Sci. Pol., Oeconomia, 14 (4), 13–23.

ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

ACTA SCIENTIARUM POLONORUM *Oeconomia 14 (4) 2015, 25–36*

EVALUATION OF REGIONAL WAGE CONVERGENCE IN POLAND

Ewa Ferens
Warsaw University of Life Sciences – SGGW

Abstract. The aim of this paper is to present and analyze the regional differentiation of nominal wages in Section A of Polish classification of business activities (PKD) and in the entire economy in Poland in the years 2005–2013 and to examine whether there is a convergence or divergence process in the level of this wages. The results show that in spite of gradual wage growth in all voivodships, the regions do not converge in this term. In case of nominal wages in agriculture sector, a slight beta convergence is observed.

Key words: regional convergence, wage distribution, Poland

INTRODUCTION

The fact that regional economic development is unequal has long been recognized by economists. Disparities in socio-economic development of regions are a natural phenomenon arising from uneven access to the basic factors of production such as capital, labour, natural resources or technology. Regardless of the causes, the European Union (EU), since the early days of integration, has attempted to overcome this phenomenon in order to achieve a greater degree of cohesion within the Community. Already the Article 2 of the European Community Treaty[1] defines as its task "a high degree of convergence of economic performance" by establishing a common market and economic monetary union. Till now one of the main goals remains the attainment of progressive convergence of economic performance while fostering economic integration throughout the EU as a whole. In the newest strategy "Europe 2020" the socio-economic convergence for the EU member has been considered as one of the most important eco-

Corresponding author: Ewa Ferens, Warsaw University of Life Sciences, Faculty of Economic Sciences, Nowoursynowska 166, Warsaw, Poland, e-mail: ewa_ferens@sggw.pl

[1] Treaty establishing The European Community, Rome, 25 March 1957.

nomic targets, concentrating national resources and EU funds on the areas and sectors where they can make the most important progress.

For a long time it appeared that the European countries were on a converging path and, therefore, the formulated policies and implemented structural funds brought about the desired effects. At the national level, relatively strong economic growth of those with low GDP per capita has meant that the EU countries have been converging [e.g. Kaitila 2004, Forgó and Jevčák 2015]. However, while the EU is experienced cross--country convergence, a number of studies have demonstrated that the inter-regional disparities have grown since the 1980s [Neven and Gouymte 1994, Button and Pentecost 1995, Siriopoulos and Asteriou 1998].

Many empirical studies examine regional convergence expressed in terms of a negative relation between growth rate and the initial level of per capita income or labour productivity. While regional differentiation of GDP is widely discussed and analysed there is not so much research concerning disparities in wages particullary on the regional level. Labour plays a major role in the functioning of an economy. From the point of view of enterprises, wages represent a labour cost that includes not only salaries paid to workers but also non-wage costs, mainly social contributions payable by the employer. As far as employees are concerned, wages comprise the price of their work and they generally represent their main source of income, and therefore have a major impact on their ability to spend or save.

Since Poland is a member of the EU and strives for socio-economic cohesion within the Community, an important economic question is whether it faces a convergence or divergence process in wages on the regional level. Does the price of labour in agriculture sector change in such a way as in other sectors of the economy? Accession of Poland to the EU brought on the changes to domestic agricultural sector. The agricultural market became larger and Common Agricultural Policy was implemented. Generally, agriculture is a sector with relatively lower level of wages than in other sectors. Poland remains the country with one of the lowest wages in this sector in the UE.

The presented paper focuses on the dynamism of changes in wages differentiation in Polish regions since the year 2005, so after joining the UE. The main aim of the study is to present and analyze the regional differentiation of nominal wages in the entire economy and in agriculture sector in Poland in the years 2005–2013 and to examine whether the level of those wages in Polish regions converge or diverge.

The structure of the paper is organized as follows. In the next section, the main research findings concerning the regional convergence process are summarized, with special attention devoted to the level of wages. Then, the Polish regional wages characteristics are described. After the description of the research method, the empirical results are shown. The article ends up with some conclusions.

REGIONAL CONVERGENCE – A BRIEF REVIEW

Convergence refers, in the economy, to the process aimed at reducing differences between entities featuring a diversified initial level of development [Markowska and Strahl 2012]. Both nominal and real variables can undergo this process, thus respectively

nominal or real convergence can be examined. Regarding regional convergence, it can be defined as the process or tendency of regions towards greater similarity or equality of variables of the economy.

Different approaches for the convergence process regarding GDP have been widely discussed in the literature [e.g. Sachs and Larrain 1993, Lipschitz et al. 2005, Pelkmans 2006]. In order to sum up existing scientific discussion and results few factors can be isolated, which influence the occurrence of convergance or divergence process.

The first factor, which is required for the regional convergence is the existence of decreasing marginal productivity of capital. A decline of marginal product of capital has a slowing down effect on economic growth rate [see Tokarski 2001a, b]. In the opposite situation, under an assumption of increasing marginal products of capital, the capital concentration and advancing polarization of economic development between regions can be expected. Capital flows to poorer regions, where usually capital resources per employee are lower, allow getting higher marginal productivity. This tendency favours equalization of technical devices, thus it implies the convergence process on labour productivity and wages. Capital flows cause that regions, that in initial year demonstrated lower level of income, are able to achieve faster economic growth rate.

The second important factor affecting the process of regional convergence is technological progress. Regional differentiation in generating and adopting new technologies may essentially diversify long-run economic growth paths [Tokarski and Gajewski 2003]. This may lead to divergence in the aspect of technical efficiency of production, which in turn will find reflection in divergence of GDP per capita. However, some authors raised another aspect of innovation progress [see for example: Abramowitz 1986, Keely and Quah 1998, Luiten and Harmsen 1999]. Namely, technological progress can be a factor enhancing convergence as long as economically backward regions may benefit from the technical improvements. The lack of costs of generating new technologies can be a favourable factor equalizing technical efficiencies. Additionally, the more universal and available new innovative solutions are, the faster process of convergence can be expected. However, fast technical development will make it more difficult for backward regions to catch up.

Other factors which might influence regional convergence process include disparities in the level of infrastructure, high fixed costs in enterprises and agglomeration effects. Economically weakest regions are often characterized by poor infrastructure, which increases the cost of investments, while high fixed costs are an obstacle for flows of investments.

What concerns economic agglomeration which affects regional income disparities, it has been a subject of economic geography research already since early 1990s [see Krugman 1991]. Combes et al. [2008] pointed out that "economic activities are concentrated in a limited number of regions, which form the core of a civilization, while the other regions stagnate, or even regress, and these are known as the periphery". According to Hanson [1997], wages are correlated with agglomeration and they decrease monotonically as one moves away from the economic center.

The basis for regional convergence to occur are continued structural changes, which allow a given region to reduce distance to the other more developed spatial units. Equalisation of GDP per capita leads to reducing disparities in the level of wages and

consequently in the standard of living of inhabitants. If long-term economic growth rate in affluent regions is higher than in others, those less well-off ones will suffer from lower wages growth and higher unemployment rate. This in turn foster migration flows. Therefore, in order to even out the level of wages, more and more financial resources for the redistribution actions will be required. However, capital mobility evokes also the structural changes, which consist of reallocation of productive factors to more effective application. For example, labour productivity in agriculture is much lower than in others sectors and the backward regions are characterized by high share of agriculture in the structure of regional GDP. In this case the labour flows to non-agricultural sectors increase social labour efficiency and indirectly also the level of wages [Zieliński 2011]. That is why high labour mobility fosters regional convergence, being complementary or even able to replace capital flows in the process of equalization of marginal productivity. The scale and directions of labor flows depend on such factors as differences in wages, unemployment rates, working conditions, standard of living, and removal expenses as well as social, demographic and economic characteristics of a given person [Amstrong and Taylor 2000]. Though, sometimes high labour mobility may not have positive influence on wages convergence. This happens when emigrating employees have high qualifications and their outflow means brain drain that can lead to divergence process. Spatial differentiation of wages is also connected with the economy structure, because salaries in individual sectors are not equal. The bigger share of employees in good paid sectors in a region, the higher are average wages.

The methods of analyzing the phenomenon of convergence generally come from the growth economics literature that isolated three concepts of convergence: unconditional (absolute) β-convergence, conditional β-convergence and σ-convergence [Barro and Sala-i-Martin 2003].

Absolute σ-convergence assumes that all economies are structurally identical and are characterized by the same steady states while differ only by their initial level of per capita incomes [Kang 2011]. This concept refers to a process in which poorer regions grow faster than richer ones and therefore catch up with them. The economies converge towards their steady states at a declining growth rate. However, the steady-state may depend on a series of determinants which are specific to each economy such, as internal policy, institutions, level of technologies, saving ratio, industrial structures. Beta-convergence is then said to be conditional. In this case, regions converge to their own steady states rather than to one general steady state assumed in unconditional β-convergence. Conditional β-convergence exists when the correlation between growth and initial income is negative under the assumption that the influence of other factors is held constant [Kang 2011].

The third concept, σ-convergence, refers to the dispersion of per capita income at a given moment in time. So, it serves as an indicator to measure weather the distribution of income across regions has become less uneven over time [Marzinotto 2012]. This type of convergence can be expressed by several indices such as simple standard deviation, coefficient of variance and Gini coefficient. If the dispersion of per capita income among economies falls over time, the occurrence of σ-convergence can be stated.

REGIONAL CHARACTERISTICS OF WAGES IN POLAND

The issue of wages convergence and spatial differences in the Polish labour market on the regional level so far have not been very extensively investigated [e.g. Newell and Socha 2005, Rogut and Tokarski 2007, Misiak et al. 2011, Zieliński 2011, Cieślik and Rokicki 2013]. In regard to economic development and the level of wages in Poland, it can be observed, mainly because of historical reasons, that in the western areas the standards of living and wages are higher and the unemployment rate is lower than in the eastern regions. However, the large fraction of the economy is concentrated in the Mazowieckie region, where the capital city is located. Due to Warsaw agglomeration, the capital region has the highest wages and the lowest unemployment rate in the country. Though, it does not apply to the peripheral subregions of this voivodship, which are economically backward.

Studies showed that after the economic transformation, salaries started slowly to increase in every Polish region and the distribution of wages had not become relevantly more unequal through the transition [Newell and Socha 2005, Cieślik and Rokicki 2013]. However, there is a clear contrast between the Mazowieckie region and the other regions. Especially since 1999, the regional wage differentials have increased as the Mazowieckie has experienced much higher wage growth rate than other regions, which was mainly driven by increasing salaries in Warsaw agglomeration. Except the distance from the capital, also the distance from the German border mattered for regional relative wages [Cieślik and Rokicki 2013].

As it is shown in Table 1, in 2005 the highest level of average monthly gross wage was definitely in Mazowieckie and then regions: Śląskie, Pomorskie, Dolnośląskie, Zachodniopomorskie and Małopolskie. The regions with the lowest wages were Podkarpackie, Warmińsko-mazurskie, Lubuskie and Kujawsko-pomorskie. In 2013, almost 10 years after joining the EU, the average wages increased in all regions in relation to initial year (2005) – from 48 to 60%, depending on a region. However, the biggest growth was seen in voivodships: Łódzkie, Lubelskie, Podkarpackie and Podlaskie, and the lowest in Mazowieckie.

Figure 1 illustrates regional differentiation of wages in Section A of PKD[2] in 2005 and 2013. In 2005, the highest wages in the sector of agriculture, forestry and fishing were paid in Świętokrzyskie and Podlaskie, followed by Mazowieckie, Śląskie and Podkarpackie region, while the lowest ones – in Wielkopolskie, Kujawsko-pomorskie and Opolskie region. In 2013 still the top ranked regions were respectively Świętokrzyskie, Podlaskie and Mazowieckie.

All voivodships experienced an increase in nominal wages between 2005 and 2013 (from 58 to 79%). Nevertheless, the biggest growth was witnessed in Opolskie, Dolnośląskie, Lubelskie, Kujawsko-pomorskie, Małopolskie and the lowest, in contrast, Podkarpackie, Świętokrzyskie and Śląskie (see Table 2).

[2] List of classification of business activities in Poland. Section A includes: products of agriculture, forestry and fishing.

Table 1. The average monthly nominal gross wages in Polish regions in 2005 and their increase till 2013

Region	Wages in 2005 (PLN)	Growth in 2005–2013 (%)
Mazowieckie	3 227.04	+ 47.92
Śląskie	2 587.07	+ 55.50
Pomorskie	2 511.25	+ 53.20
Dolnośląskie	2 477.56	+ 56.16
Zachodniopomorskie	2 307.99	+ 53.34
Małopolskie	2 303.42	+ 55.17
Wielkopolskie	2 263.60	+ 55.30
Opolskie	2 249.89	+ 54.38
Podlaskie	2 192.77	+ 56.55
Łódzkie	2 188.15	+ 60.42
Lubelskie	2 180.18	+ 60.01
Świętokrzyskie	2 173.15	+ 54.15
Kujawsko-pomorskie	2 153.46	+ 54.27
Lubuskie	2 144.35	+ 53.06
Warmińsko-mazurskie	2 103.99	+ 55.16
Podkarpackie	2 081.76	+ 57.69

Source: Own elaboration based on GUS data.

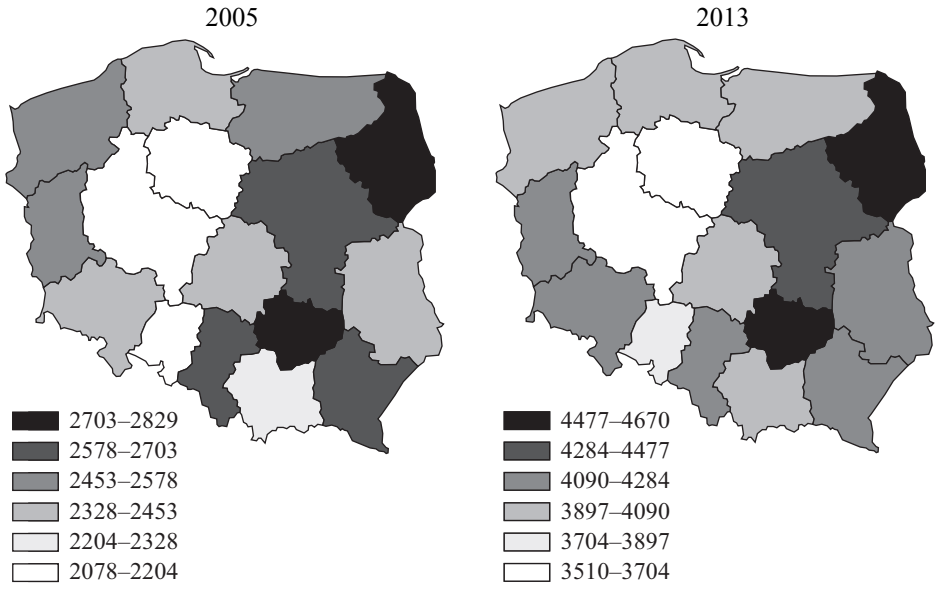

Fig. 1. Average nominal wages in Section A (PLN)

Source: Own elaboration based on GUS data.

Table 2. The growth of average nominal wages in the sector of agriculture, forestry and fishing (Section A) in 2005–2013

Region	Growth in 2005–2013 (%)	Region	Growth in 2005–2013 (%)
Opolskie	+ 79.28	Pomorskie	+ 67.08
Dolnośląskie	+ 71.99	Zachodniopomorskie	+ 64.63
Lubelskie	+ 71.80	Mazowieckie	+ 62.67
Kujawsko-pomorskie	+ 71.72	Lubuskie	+ 61.94
Małopolskie	+ 71.27	Warmińsko-mazurskie	+ 61.90
Podlaskie	+ 70.49	Śląskie	+ 59.68
Łódzkie	+ 69.36	Świętokrzyskie	+ 59.52
Wielkopolskie	+ 68.88	Podkarpackie	+ 58.41

Source: Own elaboration based on GUS data.

DATA AND RESEARCH METHOD

This study focuses on the analysis of average nominal wages at the regional level in Poland. The data come from the Polish Local Database GUS for the period of 2005––2013. Average monthly gross wages and salaries are defined by GUS as the relation of the sum of gross salaries and fees paid to certain groups of employees for performing work under labour contracts, payments from profit and from balance surplus in co-operatives, annual extra wages and salaries for employees of budgetary sphere entities to the average number of employees, excluding outworkers, apprentices and persons employed abroad.

In order to estimate the absolute β-convergence process on average monthly wages in an entire economy and in the Section A in Polish regions, the following regression equation[3] was applied:

$$\frac{1}{T}\ln\left(\frac{y(T)}{y(0)}\right) = \alpha_0 + \alpha_1 \ln y_0 \tag{1}$$

where: T – the number of investigated years;
$y(T)/y(0)$ – the level of average wage in a region in final year / the level of average wage in a region in initial year;
α_0 – constant level;
α_1 – slope parameter.

The dependent variable is average wages growth rate and the explanatory variable is the level of average wage in initial year. A negative relationship between these variables indicates a convergance, thus negative and statistically significant value of α_1 is

[3] For more explanation see Barro and Sala-i-Martin [2001].

the sign of a convergence process. In the next step, based on the value of α_1 the β-convergence can be estimated as follows:

$$\beta = \frac{1}{T}\ln(1 + \alpha_1 T) \tag{2}$$

The parameter β indicates the rate at which regions approach their steadystate per year and hence the speed of convergence. Based on β value, the so-called half-life (*hl*) can be computed, which means the time span which is necessary for current disparities to be halved:

$$hl = \ln 2/\beta \tag{3}$$

Convergence analysis through β-convergence concept focuses only on average values in reference time period. It brings little while trying to analyse the convergence process in particular years. To measure this, a Σ-convergence approach is much more suitable, which refers to a reduction of disparities among regions in time. Formally, β-convergence is necessary but not suffcient for Σ-convergence.

The most frequently used summary measures of Σ-convergence are the standard deviation or the coeffcient of variation of regional GDP per capita [Monfort 2008]. In this paper, in order to analyse Σ-convergence proces on avarage wages I used coefficient of variation which is defined as the ratio of the standard deviation to the mean. It shows the extent of variability in relation to the mean of the population.

$$c_v = \frac{\sigma}{\bar{x}} \tag{4}$$

RESULTS

Parameters regarding β-convergence calculated by using the equations (1)–(4) are listed in the Table 3.

Table 3. Statistic values measuring β-convergence process

Scope of research (2005–2013)	α_1	β	Half-life
Avarage wages in total	–0.012	0.013	53.30
Avarage wages in Section A	–0.029	0.034	20.38

Source: Own elaboration.

The estimated regression equation confirmed absolute beta convergence process on average monthly wages in the sector of agriculture, forestry and fishing (Section A) in Polish regions in the years 2005–2013. The slope of the line is negative and steep, slope parameter $\alpha_1 = –0.029$. However, this process occurs to a modest extent. The calculated value of 0.034 indicates very small rate at which regions approach their steadystate per year. The time span which is necessary for current disparities to be halved is 20 years.

As can be seen in Figure 2, Polish regions with the lowest level of wages in Section A in a basic year had the highest rate of growth of average wages in the next nine years. To this group belong definitely Opolskie, Kujawsko-pomorskie, Małopolskie and Wielkopolskie region. Quite high average growth rate was also achieved in Dolnośląskie, Lubelskie, Podlaskie and Łódzkie. It is worth to underline that Podlaskie is the only region with high wages in intial year which accomplished avarage wages growth rate as well. Definitely the lowest wages growth appeared in Podkarpackie, Świętokrzyskie, Śląskie, Warmińsko-mazurskie, Lubuskie and Mazowieckie. These are the regions which in initial year were characterized by the highest level of wages in agricultural/forestry sector.

What concerns the avarage wages in the entire regional economy in the years 2005––2013, admittedly the parameter $\alpha_1 = -0.012$ indicated beta convergence process, but it is not very statistically significant. However, the value of allows to exclude divergence process.

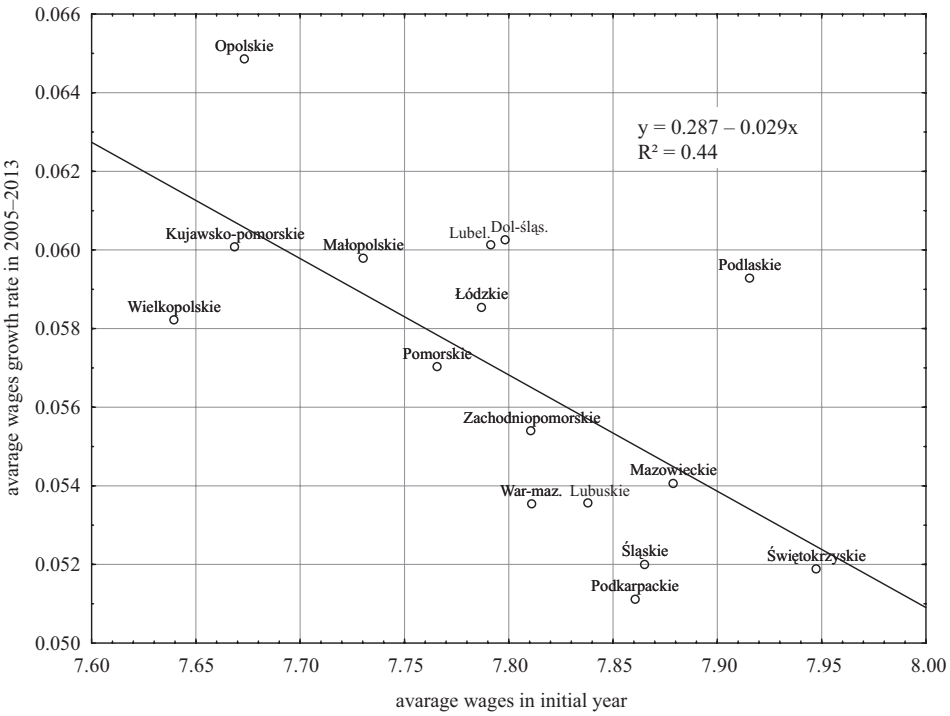

Fig. 2. Wages β-convergence in Section A of PKD in Polish regions in 2004–2014

Source: Own elaboration based on GUS data base.

Sigma-convergence in wages occurs when in the consecutive observation moments, coefficients of variation for the analyzed regions are characterized by a downward tendency. Figure 3 illustrates coefficients of variation for the wages in Section A and in the entire regional economy in the investigated period.

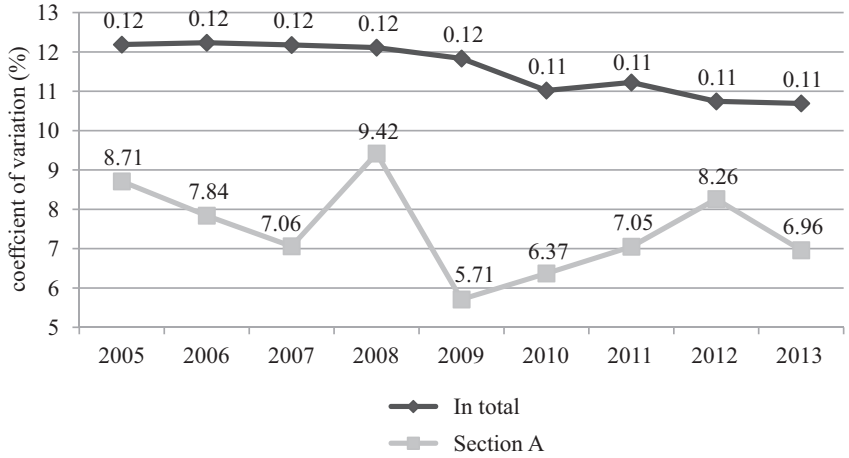

Fig. 3. Sigma-convergence of average wages in Section A and wages in the entire economy in the years 2005–2013

Source: Own elaboration.

Values of coefficients referring to average gross wages in a whole regional economy illustrate slight downward trend. This suggests that regional disparities in wages decrease. However, this process proceeds very slowly. As regards wages in section A, values of coeffcients of variation illustrate quite diversified tendencies. Fluctuations of the interregional dispersion measure values are quite noticeable, which means that the sigma convergance process on wages in agriculture and forestry does not occur.

CONCLUSIONS

In this paper the wages differentiation on the regional level after Poland's accession to the European Union was investigated. In the period 2005–2013, an increase of average nominal wages in the whole economy as well as wages in the agriculture, forestry and fishing (Section A) was observed in all Polish regions. However, their growth rate in Section A was higher comparing with the whole regional economy.

The results presented suggest that in spite of gradual wage growth in all voivodships, the regions rather do not converge in terms of wage level. However, the divergence in nominal wages was excluded as well.

In the case of nominal wages in Section A, a slight β-convergence was observed. The regions which in the basic year were characterized by the lowest wage levels in agricultural/forestry/fishery sector (Opolskie, Kujawsko-pomorskie, Małopolskie and Wielkopolskie) experienced the biggest percentage growth over the period 2005–2013. On the contrary, in the regions with the highest wages in 2005 (Podkarpackie, Świętokrzyskie, Śląskie) this growth was the lowest. However, no Σ-convergence was proved, suggesting that the distribution of wages in agricultural sector across regions has not become less uneven over the investigated period of nine years.

The paper leaves some issues to be considered in the further research. For example, it would be useful to consider the regional differentiation of wages in other sectors of the Polish economy, also taking into account labour productivity in particular sectors. Finally, it would also be instructive to investigate the influence of emigration of workers on the regional structure and level of wages in Poland.

REFERENCES

Abramowitz, M. (1986). Catching up, forging ahead, and falling behind. The Journal of Economic History, 46 (2), 385–406.

Amstrong, H., Taylor, J. (2000). Regional economics and policy, Blackwell Publishers, Oxford.

Barro, R.J., Sala-i-Martin, X. (2003). Economic growth. Second edition. MIT Press.

Button, K., Pentecost, E. (1995). Testing for convergence of the EU regional economies. Economic Inquiry, 33, 4, 664–671.

Cieślik, A., Rokicki, B. (2013). Regional structure of wages in Poland over the period 1995–2009. Equilibrium. Quarterly Journal of Economics and Economic Policy, 8, 3, 65–78.

Combes, P.P., Mayer, T., Thisse, J.F. (2008). Economic geography. The integration of regions and nations. Princeton University Press, Princeton.

Forgó, B., Jevčák, A. (2015). Economic convergence of central and eastern european EU member states over the last decade (2004–2014). Discussion Paper, 001. Publications Office of the EU, Luxembourg.

Hanson, G.H. (1997). Increasing returns, trade and the regional structure of wages. Economic Journal, 107 (404), 113–133.

Kaitila, V. 2004. Convergence of real GDP per capita in the EU-15: How do the accession countries fit in? ENEPRI Working Paper, 25.

Kang, Y.D. (2011). Real convergence and European integration. What factors make the difference in growth at regional level? KIEP Research Paper, 11–10.

Keely, L.C., Quah, D. (1998). Technology in growth. CEPR Discussion Paper, 1901.

Krugman, P. (1991). Increasing returns and economic geography. Journal of Political Economy, 99, 3, 483–499.

Lipschitz, L., Lane, T., Mourmouras, A. (2005). Real convergence, capital flows, and monetary policy: notes on the European transition countries. [In:] S. Schadler (Ed.), Euro adoption in central and eastern Europe: opportunities and challenges. International Monetary Fund, Washington DC.

Luiten, R., Harmsen, E. (1999). A conceptual model for understanding technology development. Conference Proceedings: Technology Studies and Sustainability, 99033, Deutschlandsberg, Austria.

Markowska, M., Strahl, D. (2012). Evaluation of the European Union regions convergence regarding innovation. Argumenta Oeconomica, 1 (28), 41–67.

Marzinotto, B. (2012). The growth effects of EU cohesion policy: a meta-analysis. Bruegel Working Paper 14. Retrieved from bruegel.org/wp-content/uploads/imported/publication/WP_2012_14_cohesion_2.pdf.

Misiak, T., Tokarski, T., Włodarczyk, R. (2011). Konwergencja czy dywergencja polskich rynków pracy? Gospodarka Narodowa, 239/240 (7/8), 47–69.

Monfort, P. (2008). Convergence of EU regions. Measures and evolution. A series of short papers on regional research and indicators produced by the Directorate-General for Regional Policy.

Neven, D., Gouymte, C. (1995). Regional convergence in the European Community. Journal of Common Market Studies, 33 (1), 47–65.

Newell, E., Socha, M. (2005). The distribution of wages in Poland, 1992–2002. Discussion Paper, 1485. IZA, Bonn, Germany.
Pelkmans, J. (2006). European integration. Methods and economic analysis. FT Prentice Hall, 317–335.
Rogut, A., Tokarski, T. (2007). Determinanty regionalnego zróżnicowania płac w Polsce. Ekonomista, 1, 75–89.
Sachs, J.D., Larrain, F.B. (1993). Macroeconomics in the global economy. Prentice Hall, Englewood Cliffs, N.J.
Sala-i-Martin, X. (2001). The disturbing 'rise' of global income inequality. Economics Working Papers 616, Department of Economics and Business, Universitat Pompeu Fabra.
Siriopoulos, C.D., Asteriou, D. (1998). Testing for convergence across the Greek Regions. Regional Studies, 32 (6), 537–546.
Tokarski, T. (2001a). Dwadzieścia lat renesansu teorii wzrostu gospodarczego. Na ile lepiej rozumiemy jego mechanizm? VII Kongres Ekonomistów Polskich. Polskie Towarzystwo Ekonomiczne, Warszawa.
Tokarski, T. (2001b). Determinanty wzrostu gospodarczego w warunkach stałych efektów skali. Ph.D. thesis. Katedra Ekonomii Uniwersytetu Łódzkiego. MS, Łódź.
Tokarski, T., Gajewski, P. (2003). Real convergence in Poland. A regional approach. Paper presented at the conference "Potential output and barriers to growth" Zalesie Górne. Retrieved from www.nbp.pl/konferencje/zalesie/pdf/tokarski_gajewski.pdf.
Zieliński, K. (2011). Regionalne zróżnicowanie płac w Polsce – kierunki zmian. Zeszyty Naukowe Uniwersytetu Ekonomicznego w Krakowie, 863, 69–83.

OCENA REGIONALNEJ KONWERGENCJI WYNAGRODZEŃ W POLSCE

Streszczenie. W artykule dokonano analizy regionalnego zróżnicowania nominalnych wynagrodzeń w sekcji A Polskiej klasyfikacji działalności (PKD) oraz w całej gospodarce w Polsce w latach 2005–2013, a następnie zbadano, czy zachodzi proces konwergencji, ewentualnie dywergencji, w tym zakresie. Wyniki wykazały, że mimo stopniowego wzrostu poziomu wynagrodzeń we wszystkich województwach, ich poziom między regionami nie wyrównuje się. W przypadku wynagrodzeń w sekcji A stwierdzono niewielką β-konwergencję.

Słowa kluczowe: konwergencja regionalna, zróżnicowanie wynagrodzeń, Polska

Accepted for print: 26.11.2015

For citation: Ferens E. (2015). Evaluation of regional wage convergence in Poland. Acta Sci. Pol., Oeconomia, 14 (4), 25–36.

ACTA SCIENTIARUM POLONORUM
Oeconomia 14 (4) 2015, 37–48

ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

DEVELOPMENT OF POLISH FOREIGN TRADE IN AGRI-FOOD PRODUCTS AFTER POLAND'S ACCESSION TO THE EU

Maria Magdalena Grzelak, Elżbieta Roszko-Wójtowicz
University of Lodz

Abstract. Trends in foreign trade have a huge impact on the country's position in the international market. Poland's accession to the EU was a breakthrough for the Polish foreign trade. This paper analyses trends in the Polish foreign trade in agri-food products in the years 2004–2014, after joining the European Single Market (ESM) and adopting the rules of Common Agricultural Policy (CAP). Since 2004, export growth rate in Polish agri-food products has been faster than the import one and Poland turned from an agricultural net importer to a net exporter. In the paper the value and the balance of trade in agri-food products were analysed. Further, the geographical structure of Poland's foreign trade broken-down into different groups of countries was discussed. The analysis showed that agricultural and food sector improved a lot using the opportunities offered by the accession to the EU. Development of the Polish agricultural trade proves that international competitiveness of Polish agriculture in the years 2004–2014 improved.

Key words: foreign trade, competitiveness of Polish agri-food products, CAP

INTRODUCTION

Polish integration with EU structures was preceded with several years of economic and legal preparations. They were groundbreaking events as they transformed the rules of national economy as well as led to the creation of a new social and economic quality [Bałtowski and Miszewski 2007]. First and foremost, the changes resulted from implementing by Poland new regulations in the field of economic policy, including agriculture and trade, opening the market and consequently accepting the free flow of people, goods,

Corresponding author: Elżbieta Roszko-Wójtowicz, University of Lodz, Faculty of Economics and Sociology, Department of Economic and Social Statistics, Rewolucji 1905 r. 41, 90-214 Łódź, Poland, e-mail: eroszko33@gmail.com

services and capital. On the one hand, Poland has become a large and important market outlet for EU products that, at the same time, presented a strong competition and threat for domestic production [Firlej 2008, Duczkowska-Małysz and Szymecka 2009, Urban et al. 2010]. On the other hand, Poland benefited from direct foreign investment, structural funds, policy coherence and Common Agricultural Policy (CAP), which led to economical upgrade [Rowiński and Bułkowska 2012].

The period of preparation for Poland's integration with EU structures and then full EU membership was the time of dramatic changes in Polish foreign trade. The most distinctive and positive feature of the total Polish trade transformation was Polish foreign trade exchange is agri-food sector.

Agri-food products are one of few commodities that maintain a positive trade balance. Figures for impressive positive trade balance result from a faster growth of export over import. Poland has transformed from an importer, as it was the case up to 2002, into a food exporter and is constantly improving its importance on the global market.

The main objective of the article is evaluating foreign trade situation in agri-food section throughout the period of 2004–2014. It comprises two principles:

- Presenting the level, structure and changes in time in food and agriculture foreign trade sector.
- Discussing the underpinnings of the Polish foreign trade sector in food and agriculture products, with emphasis on size and meaning of export.

The direct inspiration for raising the subject is a common opinion that food is the basic Polish export commodity. For this reason, the government should give priority to actions aimed at boosting competitiveness and recognizability of Polish food abroad.

The article presents the situation of Polish agri-food trade while Poland's integration with European Union structures. Therefore, the main factors underlying development of agri-food foreign trade sector are shown, especially in the years 2004–2014. According to the data, export is an important element determining development of Poland's foreign trade in agri-food sector

Authors pointed to problems they considered crucial for the growth of Polish foreign trade in the agri-food sector basing on the analysis of statistical data, own experience, observations of Polish and European reality as well as literature studies.

The main source of empirical data were statistical data from Central Statistical Office (GUS), research outcomes by Institute of Agricultural and Food Economics – National Research Institute (IERiGŻ-PIB) and reports and reference materials from the Ministry of Agriculture and Rural Development (MRiRW) and Agricultural Market Agency (ARR).

AGRI-FOOD SECTOR – EUROPEAN TENDENCIES

In 2014, Poland became a fully-fledged member of EU structures. Joining the European Single Market (ESM) included adopting the rules of Common Agricultural Policy (CAP). European Union agriculture policy fulfills mainly the following objectives: [*CAP post-2013*..., 2015]: (i) providing sufficient food quantities for EU citizens; (ii) securing safe food; (iii) preventing farmers from excessive price fluctuation and market crisis; (iv) assistance to farmers, aimed at investment activity and modernization of farms;

(v) supporting properly functioning rural communities; (vi) creating new as well as maintaining existing jobs in the food sector; (vii) environmental protection and animal welfare standards.

Agriculture policy is the most elaborate and most expensive policy of the European Union. Common Agriculture Policy expenses in the EU in 2013 reached 59,640 EUR [*CAP post-2013*..., 2015], which makes 39% of the total EU expenditure. Despite the decreasing tendency, spending on agriculture still absorbs most of EU budget [*CAP post--2013*..., 2015]. Currently, agriculture in developed countries generates only from 1 to 4% of GDP. The share of agricultural gross value added in GPD reached 1.6% in 2013 in well-developed countries, and its share in employment is estimated at 2–6% (average value for well-developed countries was 3.5% in 2012 (WorldBank database). Nevertheless, agriculture receives wide interest from public opinion and governments. This results from an obvious fact that agriculture provides the most important good, which is food.

Gross value added at basic prices in EU agriculture reached 158,742 million EUR in 2014, being over 2% lower than in 2013, and 1.1% higher than in 2012 (Eurostat, Economic Accounts for Agriculture). Over the analysed period, the value of agricultural production at basic prices in UE, is growing in most member states. Production value at basic price of agricultural goods output[1] in 2014 was 373 billion EUR (at current prices) and at the same time was by 21.4% higher than in 2004. The only exception were Greece and Croatia which saw decreases.

It is mainly the new member states that observed the biggest growth in agricultural production value in the EU in comparison to 2004, take Latvia (71.5%), Estonia (68.2%), Lithuania (61%), Poland (53.2%) for example, but also the UK (51.3%).

THE MEANING OF AGRI-FOOD SECTOR FOR POLISH FOREIGN TRADE

The value of trade exchange of Polish agri-food sector abroad has been constantly growing since the moment of Poland's accession to the EU. There was a dynamic growth of turnover both in export and import. The value of export was growing by 4.1%, and of import by 3.9% on average every year. Throughout the analysed period of 2004–2014, Polish trade exchange with other countries can be recognized by a growing share of agri--food goods value in the total value of foreign trade (Fig. 1). Simultaneously, the meaning of agri-food sector for the Polish foreign trade has been growing.

In the year of Poland's EU accession, agri-food export made 8.8% of the total Polish export. The share was growing over the next years reaching its top rate of 13.2% in 2013. Similar tendencies could be observed in import, however, it is worth noticing that the total share of agri-food products in import was much lower than in export. In comparison, the share of agri-food products import in the total import value reached 6.2% in 2004, as opposed to 8.8% for export. The meaning of agri-food sector in Polish foreign trade in 2014 was similar to that of the record-beating value in 2013.

[1] Production value at current producer price of agricultural goods output in 2014 was equal to 369 billion EUR (see http://ec.europa.eu/agriculture/statistics/factsheets/pdf/eu_en.pdf).

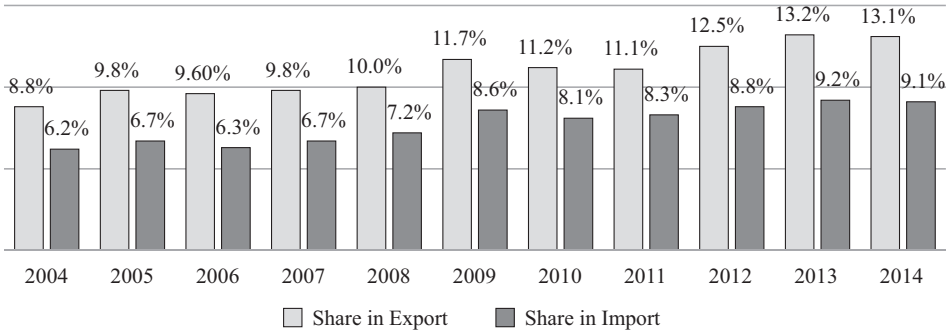

Fig. 1. Share of agri-food products in the total value of Polish export and import in the years 2004–2014

Source: Own analysis based on ARR (Agricultural Market Agency) data and *Agri-food foreign trade...* [2015].

One cannot forget that agri-food sector is one of very few braches of Polish economy that has positive trade balance. Up to 2002, trade balance for Polish foreign trade in agri-food sector was negative. Positive trade balance was first recorded in 2003 and reached 0.5 billion EUR. Substantial growth of the balance results from a faster growth of export over import in agri-food sector (Fig. 2).

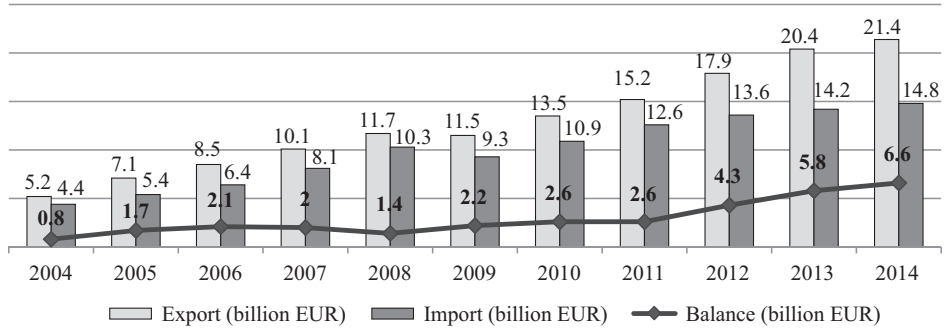

Fig. 2. Foreign trade of agri-food products in the years 2004–2014

Source: as for Figure 1.

As far as figures are concerned, the balance rose from 0.8 billion EUR in 2004 to the record level of 6.6 billion EUR in 2014. Dynamics of the balance growth is impressive because in the years 2004–2014 positive trade balance in agri-food goods was rising by 23% per year on average. The biggest balance growth came in 2005, which is one year after EU accession. In comparison to the former year, in 2005 the positive trade balance in agri-food goods went up by 113%, whereas in the following year the dynamics fell down to 24%. Unfortunately, in 2007 for the first time since entering the EU the dynamics of agri-food export was lower than figures for import. Positive trade balance in agri-food goods decreased from 2.1 to 2 billion EUR, though it still remained four times higher than before Poland's integration with the EU. The world financial crisis and resulting

economic crisis which appeared in several countries led to the decrease of positive trade balance in agri-food goods in 2009. The balance was 1.4 billion EUR in 2009 which meant a 30% decrease in comparison to the previous year. Fortunately, the problems appeared to be temporary since the following years saw a fast growth for the positive trade balance in agri-food goods (Fig. 1).

It should be emphasized, that the surplus in agri-food trade significantly reduces the Polish foreign trade deficit. In the analyzed period of 2004–2014 the value of trade in agri-food sector fell down more than four times and in case of import – it decreased three times. The positive changes brought about the surplus of trade in agri-food commodities, that reached unprecedented level of 6.6 billion EUR in 2014 as opposed to 5.8 billion EUR in 2013 (Fig. 2). Generally, in Polish foreign trade, for several years there has been a steady tendency for faster import rather than export growth. As a result, 2014 deficit grew to 2.45 billion PLN, which is an over 23% rise when compared to the previous year. Therefore, in 2014 positive trade balance in agri-food goods exceeded the total deficit value in trade almost three times.

Positive trade balance has also got a positive influence on the economic situation in agriculture and food industry due the fact that one third if the production is exported. Foreign agri-food trade is dominated by food products. In 2014 export in agri-food sector made 82% of the total export. The meaning of export for the development of Polish food industry is confirmed by more than double growth of its share in the sold food industry production. The index rose from 16.9% in 2004 to over 34% in 2014 (compare Fig. 3).

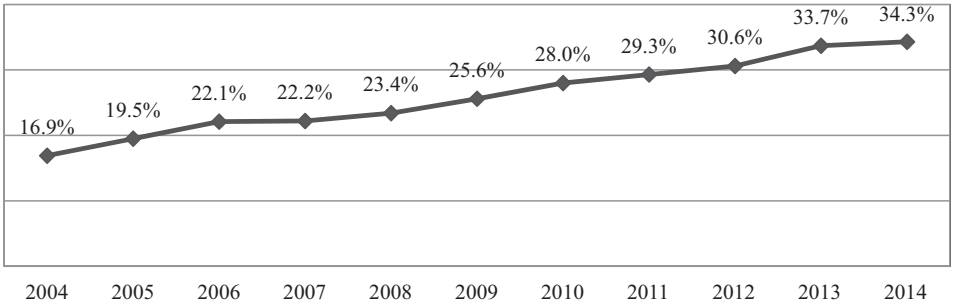

Fig. 3. Share of exports in the value of sold production of food industry in the years 2004–2014

Source: Own analysis based on Central Statistical Office database and Mroczek [2014].

Since 2004, over half the growth of food industry production has been located in foreign markets, therefore, but for export growth being a positive effect of EU accession and competitiveness, Polish food industry production would not be 48%, but only 24%. A deeper analysis of production and economic situation of food industry lets us draw a conclusion that Polish food industry turned out to be a success in EU market. One should bear in mind that Poland's integration with the EU enforced intense innovative processes in Polish enterprises. Food industry faced serious challenges related to EU norms in terms of not only product quality but also production processes. Adaptation processes in food industry were especially intense a few years before integration with

the EU, right after accession. The transformations contributed to starting up magnificent enterprises functioning in many food industry branches [Grzelak 2011].

On the basis of the data, one should not only analyse the rate of changes in export but it is also worth taking an attempt at pointing to reasons for a dynamic agri-food export growth and the resulting improvement in trade balance during Poland's EU membership. The issues shall be discussed in the next paragraph.

ANALYSIS OF EXPORT OF AGRI-FOOD PRODUCTS IN THE YEARS 2004–2014

During the analysed period of 2004–2014, agri-food export value reached a record level of 21.4 billion EUR in 2014, and a year after Poland's accession it levelled off at 5.2 billion EUR. In the years 2004–2014, average yearly rate for export growth was 15%. The biggest growth dynamics was recorded in 2005, when agri-food export rose by nearly 37%.

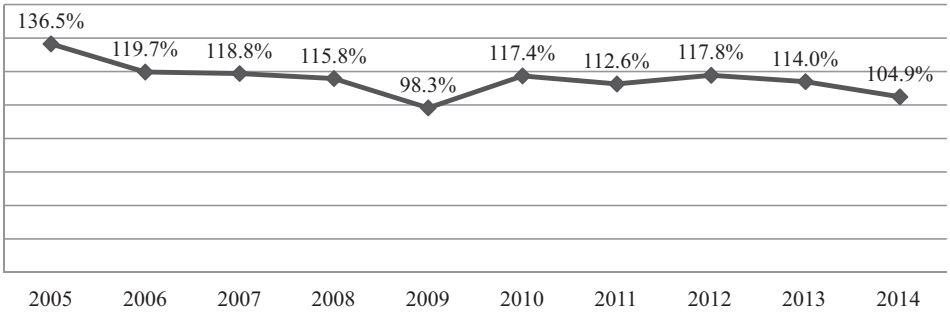

Fig. 4. Export dynamics of agri-food products in the years 2004–2014 (previous year = 100 in value terms)

Source: Own analysis based on the ARR (Agricultural Market Agency) data and *Agri-food foreign trade...* [2015].

Dynamic export growth is closely related to accelerated liberalisation of trade with the EU. Integration with the EU meant a new situation for the Polish foreign trade, especially in agri-food products. In case of industrial products, the scale of changes was smaller because free trade zone in non-agricultural products has been existing only since 1 January 2002. When it comes to customs protection in agri-food trade, as well as trade size monitoring by means of value quota, it expired on the first day of membership.

Accession entailed removal of tariffs on agri-food products between Poland and other EU countries, and in case of trade with non-EU countries, EU customs duty tariff was in force [*Analysis of production...* 2006]. Substantial export growth of agri-food from the first years of EU membership was also determined by preparation for integration in meat, dairy, poultry and fishery industries which turned out better than expected. Enterprises representing the four branches did not gain unlimited access to EU markets on 1 May 2004 as a matter of course. Only companies that respected EU sanitary and veterinary

standards were able to export. On accession day it turned out that, contrary to previous estimations, the conditions are met by so many firms that they are able to satisfy other countries needs providing them with our products. Also international chain stores operating in the Polish market, with their distribution channels in many countries, must have contributed to export growth [Chechelski 2007].

It must be emphasized that after Poland's EU accession there was a dynamic export of highly processed food products, i.e. products with high added value. There was a high growth of export rate of highly processed products in bakeries, confectionary, fishery and meat industry. Trade liberalisation and opportunities to import cheaper products for domestic food industry boosted export of high processed food products substantially. Production and export of beer, cigarettes and preserved fish would not be possible without increased import of malt, fish or unprocessed tobacco [*Analysis of production*... 2007].

Analysis of changes carried out in the years 2004–2014 pointed that there was a decrease in agri-food export value by 1.3% only in 2009 (when compared with the previous year), which partly resulted from the world economic crisis. Fortunately, it was a unique situation and next year in 2010 export regained growth tendency, with a substantial growth value at 17%. Interestingly, agri-food export was rising over the next years although its dynamics decreased in 2013 and 2014 (compare Fig. 4). Research by Institute of Agricultural and Food Economics shows that agri-food export outcome is influenced by economic and political circumstances in the world, especially Europe [*Foreign trade in agri-food products*… 2015]. The main factors determining the situation are: currency changes, especially dollar appreciation, a dramatic fall of oil prices, Ukraine conflict and resulting limitations in trade with Russia, unstable situation in the Near East and euro zone insecurity.

Similarly to previous years, commodity structure of Polish agri-food export in 2014 was dominated by livestock, meat, preserved meat, fruit, vegetables and other preserves. In comparison to 2013, there was a rise in cereals (seeds and processed cereals), dairy products, tobacco and tobacco products. At the same time the share of fruit, vegetables, processed fruit and vegetables, but also meat (including livestock) and confectionary products, fell down (Fig. 5).

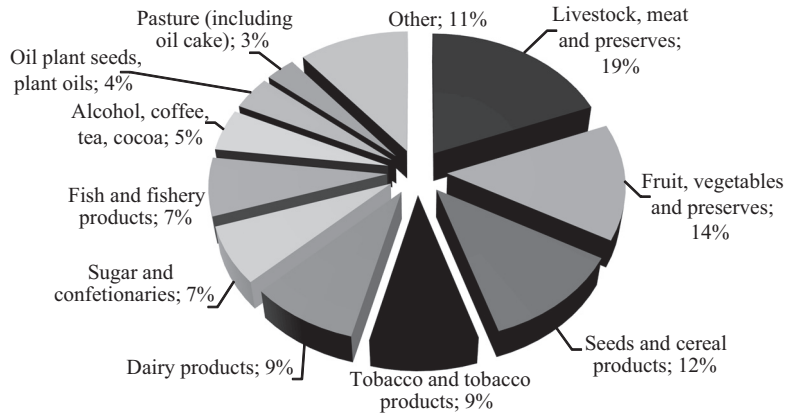

Fig. 5. Commodity structure of Polish export in agri-food products in 2014

Source: *Foreign trade in agri-food commodities*... [2015].

Analysing geographical structure, one draws a conclusion that EU was the most important outlet market for Polish agri-food over the period of 2004–2014. In 2004, EU-15 countries only had a 57% share in the Polish agri-food export, whereas a year before the accession it was 51%. Next years of the period brought further growth of the meaning of EU market, which, to a large extend, was a consequence of EU expansion. In 2013, 73% of agri-food export was sold to EU member states, and in 2014 – 79% (Table). Participation level of new member states (EU-13) in Polish agri-food export is constantly growing.

Table. Geographical structure of Polish foreign trade in agri-food products in 2004 and 2014

Group of countries	2004		2014[b]		2004 = 100
	M EUR	%	M EUR	%	
Export					
EU	3 781.8	72.1	16 877	79.1	446.3
– with UE-15	2 988.2	57.0	12 574	58.9	420.8
– with UE-12 (UE-13)[a]	793.6	15.1	4 303	20.2	542.2
WNP	684.8	13.1	1 685.2	7.9	246.1
NAFTA	194.6	3.7	364.1	1.7	187.1
EFTA	59.7	1.1	176.3	0.8	295.3
Other countries	521.2	9.9	2 245	10.5	430.8
Total	5 242.2	100.0	21 348	100.0	407.2
Import					
EU	2 763.8	62.7	10 217	69.1	369.7
– with UE-15	2 395.9	54.4	8 770	59.3	366.0
– with UE-12 (UE-13)[a]	367.9	8.3	1 447	9.8	393.4
WNP	91.0	2.1	593	4.0	652.1
NAFTA	110.0	2.5	315	2.1	286.8
EFTA	177.8	4.0	744	5.0	418.2
Other countries	1 263.8	28.7	2923	19.8	231.2
Total	4 406.5	100.0	14 792	100.0	335.7
Balance					
EU	1 018.0	–	6 660.0	–	654.2
– with UE-15	592.3	–	3 804.0	–	642.2
– with UE-12 (UE-13)[a]	425.7	–	2 855.9	–	670.9
WNP	593.8	–	1 091.8	–	183.9
NAFTA	84.6	–	48.6	–	57.5
EFTA	–118.1	–	–567.3	–	480.4
Other countries	–742.6	–	–677.3	–	91.2
Total	835.7	–	6 555.8	–	784.5

[a] – for 2014, EU-13, [b] – for 2014 first data.

Source: *Polish foreign trade in agri-food products...* [2005] and FAMMU/FAPA, Warsaw 2006; *Polish foreign trade in agri-food products...* [2014], https://bip.minrol.gov.pl/Informacje-Branzowe/Handel-zagraniczny-artykulami-rolno-spozywczymi/POLSKI-HANDEL-ZAGRANICZNY-ARTYKULAMI-ROLNO-SPOZYWCZYMI-w-2014-r.

Germany is the biggest consumer of Polish agri-food products among EU countries. Poland exports there such goods as fish, preserves, poultry meat, seeds and cereal products. In 2014 export to Germany was 2% higher than previous year and reached 4.8 billion EUR, with Germany's share in Poland's export value of agri-food products, just like in 2013, being 23%.

Polish agri-food products situation in EU market being significant and relatively steady, one could be worried about the Russian market which is important for our economy due to its size, geographical location and large economic potential.

Russian embargo on import of Polish agri-food commodities introduced in November 2005 presented a threat to a few branches, especially fruit farming, horticulture and meat industry. Absence from the Russian market caused by temporary bans may turn out dangerous because the empty slot after Polish exporters is being taken over by other EU members and it will not be easy to regain the market share later in time.

Throughout the whole research period, there was a rise in export to all country groups considered for analysis. However, last year brought a sharp decrease in the market share of the Commonwealth of Independent States which was only 8% as opposed to 11% in 2013. In comparison, 13% of the total agri-food export value went to the Commonwealth of Independent States in 2004. Lower sales to the Commonwealth of Independent States is first and foremost a consequence of Russian embargo on import of selected agri-food products that was implemented in 2014. This time, the ban affected all EU countries not just Poland, as it was the case before.

Total value of agri-food products exported from Poland to Russia in 2014 was 882 million EUR and it was 30% lower than previous year. Value of export to Ukraine decreased by 22% to 357 million EUR. Next, the value of export to Belarus was 7% lower than in 2013 and reached 273 million EUR. On the whole, agri-food export to Commonwealth of Independent States in 2014 was 1.7 billion EUR as opposed to 2.2 billion EUR previous year, therefore, a fall by 23% was recorded. Positive changes were also recorded in case of export to the so called other countries (from beyond EU and Commonwealth of Independent States). Export to the countries in 2014 was 2.8 billion EUR which meant a 25% growth in comparison to the previous year. Analogically, the share of those countries in the total value of Polish export in agri-food products grew by 2–13% [*Foreign trade in agri-food products*... 2015].

It is hard to agree with opinions that loss of the Russian market is not a serious problem because exporters are finding new markets. One may not forget impressive and not fully used production potential of Polish agriculture and food industry. In these circumstances it is essential to use all export opportunities, not only in agri-food sector but also in the whole economy. In case of limited possibilities of growth of demand on agri-food products in EU developed countries, Russian citizens' wide interest in Polish products offers a chance of export growth. Interestingly enough, despite modernisation of domestic agri-food sector, Russia is not able to provide for local consumption needs. Further factors having a positive influence on winning the Russian market are prices that remain lower than in western Europe and location near Kaliningrad Oblast [Batyk 2014].

CONCLUSIONS

First years of EU membership were a period of extremely rapid growth of Poland's foreign trade turnover in agri-food products. Poland turned from an agricultural net importer to a major net exporter. Demanding adaptation processes (including privatization with foreign capital) and progress made during preparation period for EU integration, made it possible to use comparative advantage on the day of opening EU market as well as in further years.

Foreign trade figures in agri-food sector in 2004–2014 reflect the competitiveness of Polish food products in the EU and world market. Initially, its source was price and cost advantage on the one hand, and the quality of Polish products appreciated by foreign consumers on the other hand.

A characteristic feature of Polish foreign trade in agri-food products over the period of Polish integration with the EU is fast-growing positive trade balance. High surplus in foreign trade in agri-food products has a significant meaning for improvement of Poland's trade balance. In 2014, the surplus covered over 73% deficit in trade in other sectors. However, for the last two years of the analysed period of 2004–2014, one may notice a major decrease in export dynamics growth. The main factors influencing food export in a negative way are Ukraine crisis and Russian embargo. Eastern crisis forces Polish exporters to search new markets. It's essential and yet possible to restructure trade orientation from the Commonwealth of Independent States to developed and developing countries. Ministry of Agriculture sees a chance of diversification in developing trade relations with The Far East, especially China.

The debate lets us draw a conclusion of a positive change in commodity structure of agri-food export over the analysed period. There is a growth of share of highly processed food, which sets the ground for manufacturers to take more advantage of gross value added. It also supports promoting Polish agri-food sector in some, especially distant, markets which is more difficult when exporting agriculture or semi-finished products.

In the circumstances of a slowing down domestic demand for agri-food products, development opportunities for this direction depend first and foremost on its competitiveness in the world food market. Price and cost advantage of agri-food sector decreasing, the meaning of innovativeness as a factor determining competitiveness is increasing. Combined with maintaining high quality of products, it should set goals for maintaining Poland's strong position in foreign food markets.

Some people claim that food might become our national specialty. If so, growth in this sector should receive more support from national policy, science and economic environment. Boosting marketing and promotion activity are a significant support trend for the sector.

Presented article is a first analysis resulting from a deeper research into changes in competitiveness of Polish food producers in international markets. Evaluation of foreign trade situation in agri-food sector over the years 2004–2014, carried out by means of analysis of foreign trade figures in agri-food products for the purpose of the paper, gives

the base for further investigation. Agri-food sector competitiveness stands for an ability to place products in foreign markets. The objective of competitiveness analyses presented in further articles will be pointing to branch differences of the investigated sector. Evaluation of competitiveness of Polish food producers will be carried out by selected competitiveness determinants, i.e. export orientation of production, revealed comparative advantage Balassa index (RCA) and Lafay index (LFI), trade coverage index (TC), as well as estimation of Poland's position in EU agri-food export.

REFERENCES

Analiza produkcyjno-ekonomicznej sytuacji rolnictwa i gospodarki żywnościowej w 2006 roku [Analysis of production and economic situation of agriculture and agri-food economy in 2006]. IERiGŻ-PIB, Warszawa 2007.

Analiza produkcyjno-ekonomicznej sytuacji rolnictwa i gospodarki żywnościowej w 2007 roku [Analysis of production and economic situation of agriculture and agri-food economy in 2007]. IERiGŻ-PIB, Warszawa 2008.

Bałtowski, M., Miszewski, M. (2007). Transformacja gospodarcza w Polsce. PWN, Warszawa.

Batyk, I.M. (2014). Perspektywy rozwoju eksportu polskich produktów rolno-spożywczych do Rosji. Zeszyty Naukowe SGGW, Problemy Rolnictwa Światowego, 14 (29), 3, 7–11.

CAP post-2013: Key graphs & figures. European Commission, Brussels 2015. Retrieved from http://ec.europa.eu/agriculture/cap-post-2013/graphs/graph1_en.pdf.

Chechelski, P. (2007). Wpływ korporacji transnarodowych na wydajność w przemyśle spożywczym w Polsce. Roczniki Naukowe Seria, 9, 3, 46.

Duczkowska-Małysz, K., Szymecka, A. (2009). Wokół trudnych problemów globalnego rozwoju obszarów wiejskich, gospodarki żywnościowej i rolnictwa. SGH, Warszawa.

Firlej, K. (2008). Rozwój przemysłu rolno-spożywczego w sektorze agrobiznesu i jego determinanty. Wydawnictwo Uniwersytetu Ekonomicznego, Kraków.

Grzelak, M.M. (2011). Innowacyjność przemysłu spożywczego w Polsce. Ocena. Uwarunkowania. Rozwój. Wydawnictwo Uniwersytetu Łódzkiego, Łódź.

Handel zagraniczny produktami rolno-spożywczymi – stan i perspektywy [Foreign trade agri-food products – current situation and perspectives]. 41. IERiGŻ-PIB, ARR, MRiRW, Warszawa 2015.

Handel zagraniczny towarami rolno-spożywczymi w 2014 r. z uwzględnieniem eksportu głównych grup towarowych [Foreign trade agri-food commodities in 2014 with major export commodity groups]. Agencja Rynku Rolnego – Biuro Programowania i Analiz, Warszawa 2015 r.

Member States Factsheets. European Commission, Brussels 2015. Retrieved from http://ec.europa.eu/agriculture/statistics/factsheets/pdf/eu_en.pdf.

Mroczek, R. (2014). Polski przemysł spożywczy w latach 2008–2013. [In:] P. Szajner (Ed.) Monitoring rynków rolno-spożywczych w warunkach zmieniającej się sytuacji ekonomicznej. Synteza z wyników badań 140, IERiGŻ-PIB, Warszawa.

Rowiński, J., Bułkowska, M. (2012). Strategie i kierunki rozwoju rolnictwa europejskiego. Materiały do syntezy 64. IERiGŻ- PIB, Warszawa.

Urban, R., Szczepaniak, I., Mroczek, R. (2010). Polski sektor żywnościowy w pierwszych latach członkostwa. IERiGŻ-PIB, Warszawa.

ROZWÓJ POLSKIEGO HANDLU ZAGRANICZNEGO PRODUKTAMI ROLNO-SPOŻYWCZYMI PO AKCESJI POLSKI DO UE

Streszczenie. Pozycja kraju na rynku międzynarodowym zależy od zmian, jakie zachodzą w jego handlu zagranicznym. Akcesja Polski do UE była przełomowym wydarzeniem dla polskiego handlu zagranicznego. Celem artykułu jest ocena zmian w polskim handlu zagranicznym produktami rolno-spożywczymi w latach 2004–2014, zatem od momentu włączenia Polski do jednolitego rynku europejskiego (JRE) i przyjęcia zasad wspólnej polityki rolnej (WPR). Od 2004 roku stopa wzrostu polskiego eksportu produktów rolno-spożywczych wzrasta szybciej niż importu, a Polska przeobraziła się z importera netto w eksportera netto produktów rolno-spożywczych. W artykule, analizie poddano wartość i saldo obrotów produktami rolno-spożywczymi. Ponadto, omówione zostały tendencje w handlu zagranicznym produktami rolno-spożywczymi w Polsce w latach 2004–2014 z uwzględnieniem poszczególnych grup państw. Przeprowadzona analiza wykazała, że Polski sektor rolno-spożywczy uległ znacznym przeobrażeniom od momentu przystąpienia Polski do struktur unijnych, tym samym wykorzystał szanse płynące z akcesji do UE. Rozwój polskiego handlu produktami rolnymi i spożywczymi potwierdza wzrost konkurencyjności polskiego rolnictwa na arenie międzynarodowej w latach 2004–2014.

Słowa kluczowe: handel zagraniczny, konkurencyjność polskich produktów rolno-spożywczych, WPR

Accepted for print: 19.11.2015

For citation: Grzelak M.M., Roszko-Wójtowicz E. (2015). Development of Polish foreign trade in agri-food products after Poland's accession to the EU. Acta Sci. Pol., Oeconomia, 14 (4), 37–48.

ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

ACTA SCIENTIARUM POLONORUM *Oeconomia 14 (4) 2015, 49–59*

SOCIO-ECONOMIC CONDITIONS OF INNOVATIVE FORMS OF APPLE PROCESSING

Wioletta Knapik, Jacek Puchała
University of Agriculture in Krakow

Paweł Malicki
AGH University of Science and Technology

Abstract. The aim of this paper is to examine the lacto-fermentation as a method of apple preservation. The output is a pickled apple, which is an alternative way for manufacturing apples and utilizing the fruit supply. The key issue for winning at the innovative product in the food market is whether consumers will accept it. The survey has been carried out for the purpose of evaluating the product: pickled apple. The results of the research show that the respondents accept the new product and a its high chance of being introduced to the food market in Poland.

Key words: food innovation, consumer acceptance, apple processing, lacto-fermentation, lacto-fermenting of apples, ecological agriculture

INTRODUCTION

Embargo imposed in 2014 by Russia on some food products, mainly apples, resulted in the fact that Polish fruiters, as leaders among the apple producers in the European Union, were especially severely affected by withholding of export of this product to the strategic recipient. In this situation other management of apples in the future years should be considered, which would not be almost entirely dependent on export to Russia. It is necessary to undertake actions ensuring disposal of these fruits – by diversifying target markets, which will allow to prevent possible liquidation of apple orchards. One way to maintain the production of apples at the previous level is their processing, which is more

Corresponding author: Wioletta Knapik, University of Agriculture in Krakow, Mickiewicza 21, 31-120 Kraków, Poland, e-mail: w.knapik@ur.krakow.pl

beneficial than sale of fresh fruits, since, among others, period of suitability for consumption is prolonged and the economic production profitability is increased and will remain permanently high.

INNOVATIVE DETERMINANTS OF PROCESSING – LITERATURE OVERVIEW

Agri-food processing is the second largest segment of agribusiness, which contains primary processing and industrial processing. This is the main part and an element of micro environmental factors [Mrówczyńska-Kamińska 2010].

Primary processing is a set of basic operations run on small scale within agricultural firms or within a buyer's company in order to prepare their produce for trading. On the other hand, industrial processing is usually run on much larger scale focused on transforming a physical form of fruits during a technological process.

The main elements of industrial processing include so-called core processing, which focuses on delivering various preparations. A different kind of processing is so-called trade processing, which is run in retail chains that trade fruits on large scale, usually in logistics centers. As a result of growing interest in consuming even more processed goods, the significance of fruit processing industry is getting stronger day by day. An agricultural segment has taken over the role of delivering resources for the entire fruit and vegetables industry [Knecht et al. 2009].

The fruit and vegetables pickles place on the fourth position after dairy products, meat and tobacco due to comparative advantages in the branches of food industry. So far, the Poland's greatest success in the fruit and vegetables processing has been the frozen food, juices and fruit drinks [Wiśniewska 2011]. Highly specialized agri-food processing is considered a stimulus to agriculture. It accelerates agricultural modernization and thus causes affecting of both segments on each other. Agri-food industry is strongly influencing the effectiveness of the entire food economy. It is seen as an enhancer of integration processes in the agri-food sector [Mrówczyńska-Kamińska 2010].

Poland's food economy can be characterized as missing tight and direct links between fruit producers and processing plants, which results in the necessity of continuous negotiations between these segments of agribusiness. It is vital to consider that fruit growers influence the processing plants as far as pricing policy is concerned. The current position of processing plants is becoming more complicated as there is a risk of falling below the break even point which is the result of international competition. It is crucial to consider an implementation of new and innovative forms of apple processing, which would give greater chance of utilizing an entire produce volume and help rise the added value.

Innovations make a foundation for cooperation between different companies, which are parts of the entire innovation system. The innovation system comprises four elements: all participants focused on innovation; interactions between these firms; micro- and macroenvironment; readiness of society to accept innovation [Rosenfeld 2002].

„A product is becoming a good for a particular market segment only (...) if market demand for each of a product or its effectiveness parameters will be fully met by more than one available product" [Christensen 2010].

Manufacturing of innovative products is only the beginning of changes, which come from an innovative idea in a form of material good or service. A particular product success on the market depends on its commoditization [Lewandowska 2014]. Practitioners, who have achieved market success highlight that this isn't just a product, which cause the change. An act of using a product makes the world change [Lachowski 2010].

Agribusiness, being a vast segment of Poland's economy, creates multiple opportunities for manufacturing, followed by delivering new products to the market. Product innovations, beside completely new ideas, technologies, may also regard goods which used to be manufactured but have already been forgotten. These can get their form unchanged or modified slightly so that they re-enter the market niche. Innovativeness also refers to new means of product distribution, which have not yet been used in a given micro- or macroregion. As far as agriculture is concerned – innovations may regard new resources or new ways of their utilization [Musiał and Wojewodzic 2014].

Clayton M. Christensen i Michael E. Raynor [2008] cite *The Innovator's Dilemma* by C.M. Christensen propose two categories referring to circumstances of innovating. These categories result in innovations being conservative or critical. In the case of conservative innovations there is a competitive advantage on the side of experienced firms which usually offer enhanced products that are prized highly. A critical role of innovations is about introducing simpler and more functional products, for a lower prize, which attract less fussy customers among previous ones or there are new customers on the way. A groundbreaking strategy is basically referring to new firms, that are not yet recognizable. There are authors who highlight that this type of strategy depends on an industry, which means that a groundbreaking concept in industry A will be a conservative one and in industry B vice versa. Assuming that a rule is the relation: conservative innovation – experienced companies and breakthrough innovation – new, inexperienced companies, then in the case of introducing a new product on the market, a situation will happen that for some of experienced companies this product will turn out to be breakthrough and for others only preservative improvement – it is necessary to come back to the starting point. In such a case it is necessary to redefine opportunities so as to make innovation became breakthrough in the eyes of significant market players. If innovation is seen by leading companies as conservative, chance for this innovation to succeed is minor. To assess whether the idea is breakthrough – Clayton M. Christensen and Michael E. Raynor suggest a conduct of three tests based on two questions regarding first two tests and one question in third test; test will be assessed positively, if in the case of: (i) first test – at least one answer is positive (questions: "Is there a group of people, which so far had to do without a particular product due to lack of possibility to purchase it or manufacture it on their own?", "Does the place where the customers can purchase the product is convenient and attractive for them?"); (ii) the second test – both answers are positive (questions: "Are the customers in less profitable market sectors ready to purchase the product at lower price at the cost of reduced parameters but on optimal and acceptable level?", "Are we able to create a business model assuming achievement of satisfactory profits at lower prices?"); (iii) third test – summarising, evaluating chances of innovations (question: "Is the given innovation ground-breaking for all interested entities in a given industry?").

Scientific research shows that at the level of single companies there is a positive correlation between level of innovation and export as an important index of international competition [Soete 1981, Malerba and Montobbio 2003]. It takes place also in the case of food processing plants [Zalewski 2012]. We may thus conclude that embargo imposed on Polish apples has to induce companies processing these fruits to bigger expenses on research-development actions.

Based on Bleaney and Wakelin research [2002] it can be concluded that not innovative companies are more willing to export, if they have a competitive advantage. On the other hand, innovative companies are more willing to export, provided that they run more innovation works. Other research indicates that likelihood of export and its intensity remain in strict connection with research-development works and implemented innovation projects [Gourlay and Seaton 2004].

From this comes a recommendation for Polish apple producers – greater innovation in particular processing companies should lead to achieving new sales markets for apples and their products. Such actions are particularly important when selling of Polish apples to Russia is frozen – in conditions of lack of the main recipient so far.

Considering impact of innovation processes on export of companies it is emphasised that the companies embedded in mature economic systems fare best with the same issues. According to indications of some of the researchers, companies able to demonstrate large commitment in innovations and in use of advanced technologies, significantly more often declare presence of various barriers. Baldwin and Lin [2002] refer to a group of specialist companies from Canada, where obstacles for innovations occur much more often than in the case of companies that do not implement innovations.

Companies in Poland, as well as in other countries of the former socialist camp, to a large extent, are still subject to the mechanisms of cost and pricing competition. Level of possibilities of Polish processing plants with regard to differentiation of products are still too low; problem is also to guarantee their optimal quality [Kowalska 2011]. However, recent years bring changes in food processing, which can give rise to optimism [Wziątek-Kubiak 2009].

MATERIAL AND METHODS

The subject of survey research was to estimate the consumer acceptance of a new product, which is pickled apple produced by means of natural lactic acid fermentation method. A comeback to revitalised tradition and introduction on a large scale of innovation methods requires to consider various factors, but eventually it is consumer who determines success of product on the food market.

As part of research, pickled apples were served for tasting, prepared in accordance with the recipe developed by food production technologists from the University of Agriculture in Kraków. After that the surveys have been done to estimate the taste of the new product and its market potential. The surveys were conducted in March 2015 by the authors of this article and the students among the participants of scientific conference (representatives of business and agricultural organisations, farmers).

RESULTS

In the research 265 people took part. Men comprised insignificant majority – 136 people (51.3%); number of women was 129 (48.7%).

Most of the surveyed, positively evaluated flavour qualities of apples (total of 68%; on question "Did you like pickled apples?" 47.2% of the surveyed answered "definitely yes" and 20.8% answered "rather yes"). This product gained higher recognition among men (77.2%) than among women (58.1%).

From among all of the respondents – more than 1/3 (97 persons, i.e. 36.6% of all) prefer only one taste, and 55 of the surveyed (20.7%) – mixed taste. Remaining respondents (113 persons, i.e. 42.6%) indicated specifically on two or more flavours that suits them mostly. Pickled apples enjoyed the greatest recognition among persons who prefer only bitter taste (four persons only). This product was appreciated also by most of the respondents (65.4%) who opted for mixed taste. The second largest group of the surveyed which preferred only one taste comprise persons who chose sweet taste (49 out of 152 persons, i.e. 32.2%). A slightly surprising fact is that the vast majority of this group (81.6%) liked pickled apples which, after all, have sour-salty flavour (Table 1).

Table 1. Evaluation of taste preferences for lacto-fermented apples (responses according to preferred taste; $N = 152$)

The kind of prefered taste	Yes (%)	Rather yes (%)	Rather no (%)	No (%)	In total (%)
Only salty	50.0	25.0	0.0	25.0	5.3
Only sweet	57.1	24.5	6.1	12.2	32.2
Only bitter	75.0	0.0	0.0	25.0	2.6
Only savory	44.4	33.3	5.6	16.7	11.8
Only sour	44.4	16.7	16.7	22.2	11.8
Mixed	52.7	12.7	10.9	23.6	36.3
In total	47.2	20.8	12.8	19.2	100.0

Source: Own research.

In the opinion of most of the respondents (64.5%) the new product, which is pickled apple, is likely to mark its presence into Polish market. In these forecasts men demonstrated greater optimism (69.1%). The same percentage among answers of women and men constitutes category "I don't know" (about 16%).

The respondents were strongly in favour of the need to support Polish apple market (91.3%). Slightly more women (93%) than men (89.7%) expressed such opinion. Only 4.2% of the respondents were not in favour of this issue. It can be assumed that such standpoint of the surveyed is, above all, a consequence of media interest of difficult situation of Polish fruiters.

The respondents foresee rather average interest of the consumers in pickled apples (68.3%). In this case, similarly as in reference to evaluation of the opportunity of this product to enter Polish market, men were more optimistic (72.8%). In total 20.8% of the surveyed referred to these chances as marginal or not present (Table 2).

Table 2. Forecasting of consumer interest in lacto-fermented apples on the Polish market ($N = 265$)

Consumer interest	Women (%)	Men (%)	In total (%)
High	10.1	11.8	10.9
Medium	63.6	72.8	68.3
Low	21.7	14.0	17.7
Lack of interest	4.6	1.4	3.1
In total	100.0	100.0	100.0

Source: Own research.

In order to determine the impact of independent variable – gender impact on answers of the respondents with regard to their opinions concerning potential interest of the consumers in the new product, verification by test of independence was applied (χ^2). Calculations combined the following categories concerning interest in pickled apple: "marginal" and "none". Eventually, no dependences between gender and interest in pickled apples were identified ($\chi^2 = 4.978 > \chi^2_{\alpha=0.05} = 5.991$).

According to the research, women prefer wider range of flavours more than men do, which, in the case of pickled apples may also mean awaiting for different flavour, not only sour-salty. As many as 90.7% of the respondents believe that pickled apples would meet with greater approval of the consumers if taste of fruits was more diverse (Table 3).

Table 3. Forecasting of consumer interest in lacto-fermented apples with varied flavours ($N = 265$)

Consumer interest	Women (%)	Men (%)	In total (%)
Yes	61.2	48.5	54.7
Rather yes	29.5	39.0	34.3
Rather no	2.3	5.1	3.8
No	5.4	5.2	5.3
Undecided	1.6	2.2	1.9
In total	100.0	100.0	100.0

Source: Own research.

Test of independence, regarding impact of a "gender" variable on assessment of possible interest in pickled apples of various flavours, demonstrated that there is no dependences between gender and opinion of consumers ($\chi^2 = 4.168 > \chi^2_{\alpha=0.05} = 5.991$) following categories were combined in test: "not" and "rather not" while "lack of opinion" was rejected.

Both the surveyed women and men believe that introduction of innovative forms of apple processing requires commitment of scientists. Opposite opinion expressed 16.6% of the surveyed consumers (Table 4).

Table 4. Survey responses in regards to scientists' efforts to advance apple processing technology ($N = 265$)

The need for scientists engagement	Women (%)	Men (%)	In total (%)
Yes	61.2	61.0	61.2
Rather yes	17.8	21.4	19.6
Rather no	9.3	8.8	9.1
No	9.3	5.9	7.5
Undecided	2.4	2.9	2.6
In total	100.0	100.0	100.0

Source: Own research.

Verification by test of independence indicates on lack of dependences between gender and opinion of consumers in this respect ($\chi^2 = 1.452 > \chi^2_{\alpha=0.05} = 7.815$); test did not include the category: "lack of opinion".

By analogy, to the question on the need of supporting Polish fruiters by scientists in introducing of new products and implementation of new technologies, the vast majority of the respondents opted for the need for such assistance (95.1%). Such support, in opinion of 47.7% of the surveyed, should be granted in every respect. Less than 1/3 of the surveyed opted for technological and marketing support (accordingly: 28.2 and 16.4%). Only 7.7% indicated social area, regarding assistance granted to fruiters. The respondents probably did not understand what is meant by the notion of "social support".

Another question concerning the assessment of flavour qualities of pickled apples was a question to the first question of the survey. This time, these qualities were positively assessed by 81.9% of the surveyed. The opposite opinion expressed 18.1% of the surveyed consumers. In the case of prior question concerning assessment of the flavour of pickled apples, there were fewer positive answers (by 13.9%). This can be explained by the fact that approval of the new product increased with commitment of the respondents in research and occurrence of questions about the need to support Polish fruiters.

The majority of the respondents appreciated the qualities of pickled apples, though samples intended for tasting were not the final product, ready to introduce on the market. Such product requires refinement of recipe and performing many tests in order to improve technology of apple pickling. In practice, with regard to apples subject to organoleptic assessment, this means assessment of the product which still requires improvements and thus raising its flavour qualities. Considering that the respondents prefer mainly sweet or mixed flavour (which has been reflected in opinions of the respondents that pickled apples of various flavours would might enjoy greater interest among consumers), positive evaluation of pickled apple with clear sour-salty note may give rise to optimism concerning chances of this product to mark its presence on the market. Such opportunities, though moderate, are observed also by the respondents who collectively expressed the need to support Polish market of apples. Certainly, such opinion is fostered by clearly observable in the last months, increasing tendency of apple

consumption on the domestic market and growth in solidarity of Poles against Russian embargo. However, in such an adverse situation fruiters are not able to manage on their own. Support can be provided also by scientists, e.g. through preparation and popularisation of new ways of processing apples with which most of the respondents agreed.

The impact of situation accompanying researches should be considered, which may have (although does not have to) connection with their results. Participants of the conferences, though representing different environments, were people aware of importance of science and modern technologies supporting work of farmers. In addition, place of research – conference centre and social premises accompanying research issues (they have been presented to the participants of the conference and thus to the respondents) might have affected the answers of the surveyed.

The respondents' opinions constitute initial outline of assessment of possibility to accept by the consumers the new product on the food market, based on natural lactic acid fermentation technology. The received image of consumer reactions is the basis for further tests in order to determine more precisely potential market opportunities of the product, which is pickled apple.

DISCUSSION

Polish society is aware of importance of apples in our daily diet. They are rich source of many vitamins; they contain flavonoid compounds and polyphenols [Paszkiewicz et al. 2012]. Worth highlighting is strong antioxidant effect of apples consuming of which impedes, most effectively from all of fruits, development of cancers, and some fruit preparations may contain more antioxidants in comparison with fresh fruit [Ścibisz et al. 2004]. On the basis of experiment aiming at, among others, examination of content of polyphenols in apple products such as: not clarified juice and apple creamogen (purée with a very fine texture), conducted in the period 2003–2004 by scientific employees of Warsaw University of Life Sciences it can be concluded that "Despite decrease in total content of polyphenols in apple creamogen in the process of its receiving and storage, their content in product is still higher than in apple juice" [Rembiałkowska et al. 2006]. However, not all forms of processing favour preservation of the most valuable nutritional values of apples. In Poland clear juices and concentrates are very popular, with production consuming about 1 million tons of apples per year. However, these products are almost completely deprived of the compounds most valuable for health – polyphenols, flavonoid compounds, vitamins and fibre (only about 5% of components contained in fresh fruit remains). The inhabitants of Western Europe, USA and Japan appreciate health-promoting properties apple and more and more often consume products in the form of naturally unclarified juices (in Germany 25%, and in Japan 80% of all preparations comprise cloudy juices, pressed in hydraulic presses, without enzymatic treatment, clarification and filtration). Biological value of such juice may be increased by subjecting it to lactic acid fermentation (so-called biojuice). In some countries of Western Europe, but also in Poland, biojuices are used in hospitals as an agent supporting treatment. Pickling of apples and their consumption in various forms was a common practice in pre-WWII Poland [Chabłowska et al. 2013].

Therefore, the new product – pickled apple used all the vitamins and nutritious value of the apple. Pickled apples offer a number of benefits for consumers and the whole fruit and vegetable industry (Table 5).

Table 5. Profits generated across the lacto-fermented apples

Economic benefits	Technological-nutritional benefits	Socio-cultural benefits
• Shortening of supply chain from fruiters to consumer • Offer of niche products from apples preserved using natural method • Extension of apples' suitability for consumption • Additional direction of processing apples as a supplement for pickles and sauerkraut cabbage recognised in Polish culture • Possibility of diversification of incomes of farmers running small orchards • Possibility of fixation of large volumes of fruits at relatively low costs of energy and own funds • Reduction in costs of warehousing of apple surpluses by resigning from using of some of cooling devices or by managing them in different way	• Stabilized content of vitamin C, provitamin A, which do not break down • Vitamins B2 and PP generated as a result of fermentation • Acetylcholine generated as a result of fermentation, perform important role in processes of food digestion, reducing blood pressure and improve transfer of nerve signals • Increase in assimilability of the fermented product by organism • Supplying of organism with lactic acid bacteria and regulation of intestinal microflora composition • Development of safe and "green" production on the basis of the natural lactic acid fermentation process	• Supporting of folklore and rural tradition • Possibility of social stimulation of unemployed people from rural areas in the processes of preparation of apples to pickling • Input for agritourism and rural tourism • Promotion of healthy food, full of vitamins and nutrients

Source: Own study.

Changes in interest of production of pickled apples can to a large extent contribute to nationwide increase in internal consumption of fruits. The whole fruit and vegetable industry is facing a number of possibilities competent use of which will allow to improve difficult situation of fruiters.

CONCLUSIONS

Economic recommendations with regard to preserving apples with pickling method are based on complete freeing of crop processing market for farmers running small agricultural farms. Allowing freedom in conducting independent operations in this respect fully corresponds to demands of a socially responsible agriculture. Survey results constitute some premises for preparation of recommendations for public institutions with

regard to remove existing legal barriers imposed on small producers of fruit processing by the State Sanitary Inspection. There is a need for further tests and social consultations in economic units having appropriate production capacities allowing produce pickled apples in short time and direct them for fast-moving distribution (FMCG). It is also possible to use available capacities through existing fruit processing plants, where, by relocation of technological lines for production of pickles, pickled apples can be produced in the periods of apple harvest for the purposes of FMCG trade. The results of survey show that there is interest on the new product, which could be a chance for development of processing apples market.

REFERENCES

Baldwin, J., Lin, Z. (2002). Impediments to Advanced Technology Adoption for Canadian Manufacturers. Research Policy, 31, 1–28.

Bleaney, M., Wakelin, K. (2002). Efficiency, Innovation and Exports. Oxford Bulletin of Economics and Statistics, 64, 1, 3–15.

Chabłowska, B., Piasecka-Jóźwiak, K., Rozmierska, J., Szkudzińska-Rzeszowiak, E., Kliszcz, M. (2013). Fermentacja mlekowa jabłek z upraw ekologicznych sposobem na otrzymanie nowego asortymentu produktów – biosoków. Journal Research and Applications in Agricultural Engineering, 58 (3), 72.

Christensen, C.M. (2010). Przełomowe innowacje. Wydawnictwo Naukowe PWN, Warszawa.

Christensen, C.M., Raynor, M.E. (2008). Innowacje. Napęd wzrostu. Studiu EMKA, Warszawa.

Gourlay, A.R., Seaton, J.S. (2004). UK Export Behavior at The Firm Level. Economic Issues, 9 (2), 3–20.

Knecht, D., Jankowska, A., Popiołek, M. (2009). Rolnictwo istotnym subsystemem agrobiznesu. Zeszyty Naukowe Uniwersytetu Przyrodniczego we Wrocławiu, Biologia i Hodowla Zwierząt, 58, 572, 91–103.

Kowalska, A. (2011). Food Quality and Its Conditionings. Acta Sci. Pol., Oeconomia, 10 (4), 43–54.

Lachowski, S. (2010). Droga innowacji. Wydawnictwo Studio EMKA, Warszawa.

Lewandowska, M.S. (2014). Innovation Barriers and International Competitiveness of Enterprises From Polish Food Processing Industry. Research Results. Acta Sci. Pol., Oeconomia, 13 (4), 103–113.

Malerba, F., Montobbio, F. (2003). Exploring Factors Affecting International Technological Specialization: The Role of Knowledge Flows and The Structure of Innovative Activity. Journal of Evolutionary Economics, 13 (4), 411–434.

Mrówczyńska-Kamińska, A. (2010). Tworzenie i rozdysponowanie produkcji rolnej na tle związków z gospodarką narodową (sektorowa analiza porównawcza rolnictwa w Polsce i Niemczech). Zagadnienia Ekonomiki Rolnej, IERiGŻ-PIB, 1, 9–25.

Musiał, W., Wojewodzic, T. (2014). Innowacyjność w zakresie gospodarowania ziemią rolniczą w regionach rozdrobnionych agrarnie. Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, 361, 164.

Paszkiewicz, M., Budzyńska, A., Różalska, B., Sadowska, B. (2012). Immunomodulacyjna rola polifenoli roślinnych. Postepy Hig. Med. Dosw. (online), 66, 637–646.

Rembiałkowska, E., Hallmann, E., Adamczyk, M., Lipowski, J., Jasińska, U., Owczarek, L. (2006). Wpływ procesów technologicznych na zawartość polifenoli ogółem oraz na potencjał przeciwutleniający przetworów (soku i kremogenu) uzyskanych z jabłek pochodzących z produkcji ekologicznej i konwencjonalnej. Żywność. Nauka. Technologia. Jakość, 1 (46), Supl., 123.

Rosenfeld, S.A. (2002). Just Clusters. Economic Development Strategies That Reach More People and Places. A Synthesis of Experiences. Regional Technology Strategies, Inc. Carrboro.

Soete, L. (1981). A General Test of Technological Gap Trade Theory. Weltwischaftliches Archiv., 117 (4), 638–660.

Ścibisz, I., Mitek, M., Serwinowska, K. (2004). Aktywność przeciwutleniająca soków i półkoncentratów otrzymanych z owoców borówki wysokiej (*Vaccinium corymbosum* L). Żywność. Nauka. Technologia. Jakość, 3 (40) Supl., 196–203.

Wiśniewska, J. (2011). Konkurencyjność przedsiębiorstw przemysłu owocowo-warzywnego. Zagadnienia Ekonomiki Rolnej, 2, 78–97.

Wziątek-Kubiak, A. (2009). Od awersji do innowacji do upowszechnienia się innowacji wśród polskich przedsiębiorstw. In: E. Adamowicz (Ed.). Polska transformacja po latach. Wydawnictwo C.H. Beck, Warszawa.

Zalewski, R.I. (2012). Platforma INNOPENA dla wzrostu innowacyjności przetwórstwa żywności w Wielkopolsce. Przemysł Spożywczy, 66, 16–19.

EKONOMICZNO-SPOŁECZNE UWARUNKOWANIA INNOWACYJNYCH FORM PRZETWÓRSTWA JABŁEK

Streszczenie. Artykuł podejmuje problematykę przetwarzania jabłek za pomocą metody naturalnej fermentacji mlekowej. Wytwarzany w ten sposób produkt, jakim jest jabłko kiszone, stanowi jedną z alternatyw w zakresie zagospodarowania nadwyżki jabłek na rynku poprzez ich przetwórstwo. Kwestią kluczową dla sukcesu innowacyjnego produktu na rynku jest jego akceptacja przez konsumentów. W tym celu przeprowadzone zostały badania ankietowe dotyczące oceny jabłka kiszonego. Wyniki badań wskazują, że respondenci akceptują nowy produkt i jego szanse na zaistnienie na polskim rynku spożywczym.

Słowa kluczowe: innowacje spożywcze, akceptacja konsumencka, przetwórstwo jabłek, fermentacja mlekowa, kiszenie jabłek, rolnictwo ekologiczne

Accepted for print: 02.10.2015

For citation: Knapik W., Puchała J., Malicki P. (2015). Socio-economic conditions of innovative forms of apple processing. Acta Sci. Pol., Oeconomia, 14 (4), 49–59.

ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

ACTA SCIENTIARUM POLONORUM *Oeconomia 14 (4) 2015, 61–70*

INNOVATION IN ECONOMIC THEORY AND THE DEVELOPMENT OF ECONOMIC THOUGHT

Marzena Lemanowicz
Warsaw University of Life Sciences – SGGW

Abstract. The article presents the theory of innovation in the attainment of economic sciences. It reviews the economics literature and looks at the importance of innovation in different economic models. It begins with an analysis of the views of representatives of classical economics, including those of Adam Smith, David Ricardo and Jean-Baptiste Say. This is followed by a discussion of the theory of innovation today, as it is handled in the knowledge-based economy. In analysing the achievements of economic thought, it shows the growing importance of innovation, research and science for socio-economic growth.

Key words: innovation, economic growth, progress, economic models

INTRODUCTION

Today, innovation enjoys continuous and growing interest in both economic theory and practice. This stems from the perception that innovation increases management efficiency and is a tool enterprises can use to achieve competitive advantage. Until the 1990s, economists did not take great interest in the issue of innovation. While it was perceived and defined in various ways, economists seemed to underestimate its impact on economic growth. In the 1990s, the paradigm of the knowledge-based economy was put forth to draw attention to the characteristics of the modern economy, increasingly benefiting from knowledge capital, and such knowledge being the source of all novelties in the market. An important step in the development of the theory of innovation was the OECD programme (the Technology/Economy Programme – TEP) initiated in 1988, which resulted in publications drawing attention to the significant impact of research and innovation on the economy and society.

Corresponding author: Marzena Lemanowicz, Warsaw University of Life Sciences – SGGW, Faculty of Economics Sciences, Nowoursynowska 166, 02-787 Warsaw, Poland, e-mail: marzena_lemanowicz@sggw.pl

The purpose of the article is to present the theory of innovation in the achievements of economic sciences, taking into account some major economic trends and models. Over the years, the development of economics as a science evolved, and was in part related to the changing conditions of management. Changing paradigms require the creation of new theories or the reinterpretation of existing ones. Leading representatives of different economic models point to the significance of various factors, ranging from traditional ones such as land and capital, to soft factors including knowledge and information. In these changing models, the approach to innovation and its role in the economy was varied and, for a long time, literally underestimated.

MATERIAL AND METHODS

These considerations are theoretical. For the purposes of the study, the economics literature was reviewed in terms of how important innovation was in different economic models, beginning with an analysis of views of representatives of classical economics, including Adam Smith, David Ricardo and Jean-Baptiste Say, and moving on through to modern times and the model of the knowledge-based economy. While analysing the subject of innovation, particular attention should be paid to the views of Joseph Schumpeter, who introduced the concept of innovation in the economics literature for the first time. Although unpopular at the time, his views had a significant influence on the theory of economic growth in later periods. In analysing the achievements of economic thought, the article shows the growing importance of innovation, research and science for socio-economic growth. The change in the approach to the importance of innovation for economic development was accompanied by the changing definition of innovation. Initially, innovation was associated mainly with technological aspects and the first application of the invention. Nowadays, the importance of non-technological innovation – e.g. organisational or marketing innovation – is emphasised, and it is defined as anything that is perceived by a person, or another entity adopting it, as new, regardless of the objective novelty of the product, technology or organisational solution.

A REVIEW OF SELECTED ECONOMIC THEORIES AND MODELS IN THE CONTEXT OF THE IMPORTANCE OF INNOVATION

Initially, the concepts of innovation, invention and novelty occasionally appeared in different economic theories, but generally speaking, the importance of innovation for the economy was marginalised. The development of the economic theory of innovation dates back to the 1950s and is associated with the economic growth research and theories Schumpeter had previously put forth.

Adherents of classical economics did not regard innovation as an important factor contributing to economic processes. In comparison with other factors, such as land, capital or labour, innovation was marginalised. Adam Smith believed that the division of labour in the economy was one of the forces determining a country's wealth. According to Smith, a growing and deepening division of labour promotes the creation of new inven-

tions, and workers who are able to focus on a narrow area of the production process are more likely to reflect on how to improve their work. Such processes, according to Smith, created opportunities for innovation and novelty. However, Smith treated inventions as a result of human curiosity and focused his attention instead on the effects of planned activities. He wrote that inventions (mainly machines) facilitated work and made it more efficient, and allowed for the generation of goods at lower labour expense [Smith 1904]. At the same time, in his book *The Wealth of Nations*, he criticised banks extending loans to fund "mad" projects. Another adherent of this economic trend, D. Ricardo drew attention to technological progress, while emphasising its insignificance for economic growth. In his book, *On the Principles of Political Economy and Taxation*, he devoted one chapter (*On Machinery*) to the role machinery and new equipment played in the economy. He also emphasised that unemployment and the displacement of labour by machines would grow in parallel with the progress of capitalism [Ricardo 1821]. Demands went up for the pace of progress to be scaled back in order to prevent layoffs.

French economist Jean-Baptiste Say, in one of the chapters in his publication *Traité d'économie politique*, presented the economic effects of introducing machinery into production. He wrote about the "benefits of innovation" achieved by using such machinery. One of the benefits was that new machines had to be developed, which gave rise to new jobs often ones that had never existed. Say also emphasised the benefits of innovation for consumers, such as lower prices of products that would become more refined and precise [Say 1855].

Representatives of mainstream classical economics were criticised for an excessive focus on physical capital and for highlighting its role in the management process, while ignoring the role intellect and skills played. These underestimated factors became the centre of attention for Schumpeter, who authored the theory of economic growth and the business cycle induced by groundbreaking innovation. He argued that the strength of economic growth lies in the key innovations that emerge on a regular basis. His theories gave rise to Schumpeter economics, and he believed that a "healthy" economy was not a balanced one (equilibrium economy) but one that was continuously disturbed by technological innovation. He wrote that "capitalism (…) should never become stationary" [Schumpeter 1994]. His theory focuses mainly on technological innovation with a dynamic nature and the potential to be applied in many fields. The view that innovation is only the first application of the solution, whereas any dissemination thereof would be referred to as imitation, is a defining characteristic of Schumpeter economics. Schumpeter is also known for creating the theory of the business (economic) cycle, and perceiving innovation as the cause of the ups and downs in the cycles. According to him, every business cycle is unique and attributable to completely different industries. A cycle's recovery phase begins with the entry of a new innovation into widespread use. This model was exemplified by hydropower, textiles and iron markets in the eighteenth century; steam power, railroads and the steel industry in the nineteenth century; and electricity, the internal combustion engine, chemicals and the Internet in the twentieth century. Once the technology has reached its maturity and the benefits arising therefrom begin to diminish, the recovery finally disappears. This phase is followed by an inevitable depression, after which a new wave of innovation will begin, destroying the old institutional structure, and then replacing it by new, more effective conditions for an impending recovery cycle.

Schumpeter referred to this phenomenon as "creative destruction". This concept shows that the demise of companies does not necessarily mean only negative consequences for the economy and society, because new, more effective companies may emerge in place of those that are ineffective and fail [Schumpeter 1994]. This drives economic growth, which improves following the recession. Schumpeter's theory is clearly associated with the theory of competitiveness. While revising various conceptions and economic models of competitiveness, Siudek and Zawojska [2014] pointed out Schumpeter's theory, noting that the company's ability to innovate that is a key for achieving competitive advantage over its rivals. Schumpeter's economic theory, apart from the theory of innovation and the entrepreneur, is based on other concepts, such as Juglar's theory of medium-term economic cycles and Kondratieff's long-term economic cycles. Schumpeter's theory was not popular among economists in the first half of the twentieth century because the link between scientific, inventive and production activity was not easily discernible. This relationship was only observed later, in the second half of the twentieth century [Fiedor 1979].

In the 1980s, inspired by Schumpeter's theory and Darwin's theory of evolution, Nelson and Winter produced their evolutionary theory of economics. The basis was the search for similarities between the phenomena occurring in nature and the economy. Nature is dominated by the struggle for survival, as a result of which only the strongest individuals can survive. In similar fashion, entrepreneurs compete against each other in order to achieve a better market position, and for this purpose they need to operate more efficiently than their competitors. To truly succeed, they must also implement innovation

At around the same the same time, in 1986, Paul Romer published his breakthrough article *Increasing Returns and Long-Run Growth*, which is widely regarded as the origins of the new growth theory (the theory of endogenous growth). Romer's theory is a variation of Arrow's "learning by doing" model. A key element of Romer's model is its demonstration of how the creation of new knowledge by individual companies can produce positive externalities in terms of the production capacity of other companies, which is due to the fact that knowledge is not entirely patentable [Romer 1986]. Any company operating in the economy uses technologies characterised by fixed revenues. As a result, investments undertaken across the sector generate, as a side effect, new knowledge which is subsequently disseminated (spill-over effects). Because knowledge accumulated within a single company has the properties of public goods, other companies gain access to the innovation thanks to the investment decisions the single innovative company made. Thus, such "external benefits" raise the general level of knowledge throughout the economy. The new growth theory emphasises the significance of technological progress as an endogenous variable, and also draws our attention to R&D, human capital and investments.

According to some economists, the existing theories of economic growth have not devoted enough space to institutions and institutional change [Freeman 1994]. Another trend in economics to emerge from and be seen in the context of innovation is an attempt to institutionalise it, although the concept of the institution itself has not been clearly explained. Representatives of the New Institutional Economics claim that institutions are an important factor differentiating economic capacity. Their quality and character influence the pace of economic growth. The economic meaning of institutions lies in the fact that

they restrict the freedom of behaviour of individuals in order to reduce uncertainty and provide order to the entire economic structure.

Institutions understood as common customs prevailing in the sphere of the economy are sociological in their character [Spychalski 1999]. These are certain rules of the game, applicable social arrangements, various types of legal solutions, standards, regulations and ordinances, as well as codes of behaviour, moral and ethical principles which impose on individuals a specific mode of procedure in the management process. According to Boland [1979], institutions are a certain form of knowledge. Representatives of institutionalism have emphasised the importance of the relationship between institutions and technological innovation. The creation of new solutions and technologies, as well as their being chosen and disseminated, results in the need for changes in the methods of procedure, standards, and the like in institutions. One proponent of making such changes is Veblen [2008], who believes that institutions need to change, adapt to and evolve together with each technological change or each change in the socio-economic situation. He associates technology both with the quality of technological equipment and technological expertise or skills (qualifications). The presence of this relationship and the pronounced emphasis on the impact of the technological sphere on institutions form the basis of Veblen's theory of economic growth.

Although the theme of innovation appears in different economic models, in practical terms it was difficult, until the end of the 1980s, to determine the relationship between economic growth, research and innovation. The international OECD programme (Technology/Economy Programme – TEP), initiated in 1988, contributed to a significant change of views in this regard. It resulted in publications pointing to the need to search for sources of technical progress through economic, scientific and innovative policy, and the development of a new methodology for measuring the results of scientific research and the application of technology, which became the primary manual (*Oslo Manual*) used by researchers and statistical offices. Thanks to the implementation of the TEP programme, more and more publications frequently drew attention to the importance of research and innovation for the economy and society [Grzelak 2011]. The appearance of successive OECD publications in the field of science – technology – innovation – economy coincided with the demand for developing economies based on knowledge. Economists were beginning understand that costs and prices were not enough to determine the competitiveness of a company, and knowledge and innovation should be seen as factors stimulating modern economic growth. The subject of the role of innovation was also reflected in the Polish literature. Those who have emphasised the relationship between innovation and economic growth include: Poznański, Fiedor, Gomułka, Romer and Kalecki [Fiedor 1979, Poznański 1981, Kalecki 1986, Romer 1990, Gomułka 1998].

The literature on innovation is vast and heterogeneous. This concept appears in a variety of sources – encyclopaedias, dictionaries, technical economics literature and studies related to economic (business) practice. As a result, there are numerous interpretations, and there is no single, universally accepted definition. Despite its great significance for economic growth, innovation has not been the subject of an in-depth study in economic theory, and the pioneering work of J. Schumpeter on the economic aspects of innovation did not exert any profound influence on later researchers [Skawińska 2009]. However,

Schumpeter is widely regarded as a pioneer of innovation theory, and believed it was involved in the following five cases [Schumpeter 1960]:

- the introduction of a new product, i.e. a product that consumers have not dealt with before;
- the introduction of a new method of production, i.e. a method that has not been tested in the industrial sector;
- the opening of a new market, i.e. a market in which the specific type of domestic industry has not operated before, whether or not such a market has previously existed;
- the acquisition of a new source of raw materials or semi-finished products, either previously existing or newly created;
- the introduction of a new organisation in a specific industry, e.g. creating or breaking up a monopoly.

Schumpeter's approach to innovation is strongly tied to the concept of "new", as he associated innovation with the first application of a solution. He did not recognise the process of the solution's popularisation as part of innovation, and referred to that process as imitation.

Today, economic sciences offer many definitions of innovation. Many stem from Schumpeter's approach; however, they present a different attitude to the degree of novelty, the area of changes, and the effect for the company and the market. The current understanding of innovation is reflected in its definitions going beyond technological aspects and incorporating organisational innovation (related to the sphere of "organisation and management") and pertaining to the relationship with the environment [Brzeziński 2001]. Kornelia Karcz [1997] explains that different attitudes to innovation result from different research purposes, a different range of analysis, the choice of approach and the interpretation of the concept of novelty. This is probably due to the fact that the theoreticians, who each define innovation differently, represent various disciplines, including management, marketing, economics and business administration, and the scope of their interest in the innovation-related issues is not uniform. Table shows definitions of innovation according to different authors. An analysis of these definitions indicates that although they vary in terms of the degree of novelty, the area of change and the influence on the company or the market, some remain faithful to Schumpeter's approach.

The analysis of these definitions implies a common feature of all innovation, namely the fact that it invariably relates to something new. At the same time, the evolution of this concept also stands out. Initially, definitions strongly emphasised technological aspects. In contemporary definitions of innovation, however, technological aspects give way to organisational and marketing terms. Today, special attention is paid to the dynamics of economic systems, with a particular focus on creativity, the flow of knowledge and learning.

Inevitably, along with the changes in the definitions of innovation, there have been changes in their typology. With the object of innovation as the basic criterion, we distinguish innovation in terms of product, technology, organisation and marketing. Another important criterion for distinguishing different types of innovation is the scale of change following its implementation. Taking this criterion into account, we can distinguish breakthrough innovations which result from long-term research and development and potentially lead to changes in the nature of the entire economy. Medium-incremental

Table. Definitions of innovation according to different authors

Author	Definition of innovation
J.A. Allen	Introduction of new products, processes or procedures to widespread use
L. Białoń	Introduction of new products and new technological process to production, and introduction of new organisational systems in order to achieve higher economic efficiency
J. Bogdanienko	Turning an invention into material reality; first application of a new idea in practice
J. Brilman	Application of a creative idea, which is a factor contributing to the development of a company and enabling it to meet challenges posed by competitors
H.G. Burnett	Every idea or thing that is new, as it is qualitatively different from the existing, well-known standards
F. Damanpour	Product, service, process, programme or device that is new to the organisation adopting or implementing it
P.F. Drucker	A specific tool used by entrepreneurs in order to introduce changes giving rise to new economic activity or new services. Changes to product design, marketing methods, prices and services offered to the customer, and changes to the organisation and management methods
Ch. Freeman	The first commercial introduction (application) of a new product, process, system or device
Ph. Kotler	Goods, services or ideas which are perceived by someone as new
E. Mansfield	The first application of an invention
Oslo Manual	Introduction of a new or significantly improved product (goods or services); a new or significantly improved process; a new marketing method; or a new organisational method in terms of business practice, organisation of the workplace or relationship with the external environment
Z. Pietrasiński	Changes deliberately introduced by man or designed by cyber systems, involving substitution of the existing state of affairs by another which has been positively evaluated in terms of specific criteria and which ultimately constitutes progress
A. Pomykalski	A process including all activities related to the creation of an idea, development of an invention, and its subsequent implementation in the form of a product or process
D.M. Rogers	Anything that is perceived by a person, or another entity adopting it, as new, regardless of the objective novelty of the idea or thing

Sources: Burnett [1953], Allen [1966], Mansfield [1968], Pietrasiński [1971], Białoń [1976], Freeman [1982], Damanpour [1991], Drucker [1992], Kotler [1994], Pomykalski [2001], Brilman [2002], Rogers [2003], Bogdanienko [2004], *Oslo Manual* [2005].

innovations lead to changes in the characteristics of enterprises, while minor ones involve improvement in the quality and functionality of products or processes and are essential in a company's ongoing operations. This criterion is also related to the degree of originality of such changes. Accordingly, there are creative innovations that give rise to a completely new state of affairs; imitative innovations involving the duplication of previously existing solutions; and apparent innovations that often mislead users by suggesting a novelty offer but are in fact not innovations.

CONCLUSIONS

The review of the economics literature conducted for the purposes of this article, clearly indicates a significant increase in the role of innovation, beginning from classical economy models, where innovations were absent from the discussion, until modern times and the knowledge-based economy model. Currently, one of the basic conditions for achieving competitive advantage and a prerequisite for maintaining competitiveness by enterprises is their engagement in innovative activity. Any company that wishes to develop needs innovation in the form of new products, technologies and organisational systems. The concept of innovation is directly associated with activities aimed at implementing changes that will lead the organisation to become more modern and competitive.

Attitudes to innovation and the methods of its creation in enterprises change regularly, along with the meaning, definition of, and theoretical approaches to innovation. These changes are directly related to the emergence of new concepts and methods which define, in an increasingly comprehensive manner, the process of creating innovation, and appreciate its impact on the development of companies and economic growth. These new innovation trends stem from market development and relate not only to the process of creating new products but also to changes in the structure of the company (in terms of organisation and marketing, this includes non-technological innovation). These new forms of innovation (non-technological innovation, user-driven innovation, open innovation, and social innovation) require new skills from economic operators while also calling for an active pro-innovation policy, in order to stimulate the creation of this type of innovation.

REFERENCES

Allen, J.A. (1966). Scientific Innovation and Industrial Prosperity. Longman, London.
Białoń, L. (1976). Poziom techniczny a zatrudnienie w polskim przemyśle w układzie gałęziowym. WPW, Warszawa.
Bogdanienko, J., Haffer, M., Popławski, W. (2004). Innowacyjność przedsiębiorstw. Wyd. UMK, Toruń.
Boland, L. (1979). Knowledge and the Role of Instititions in Economic Theory. Journal of Economic Issues, 13 (4), 957–962.
Brilman, J. (2002). Nowoczesne koncepcje i metody zarządzania. PWE, Warszawa.

Brzeziński, M. (Ed.) (2001). Zarządzanie innowacjami technicznymi i organizacyjnymi. Difin, Warszawa.
Burnett, H.G. (1953). The Basis of Cultural Change. McGraw-Hill Publishing Company, New York.
Damanpour, F. (1991). Organizational innovation: a meta-analysis if effects of determinants and moderators. Academy of Management Journal, 34, 3, 550–590.
Drucker, P.F. (1992). Innowacja i przedsiębiorczość: praktyka i zasady. Wyd. PWE, Warszawa.
Fiedor, B. (1979). Teoria innowacji. Krytyczna analiza współczesnych koncepcji niemarksistowskich. PWN, Warszawa.
Freeman, Ch. (1982). The Economist of Industrial Innovation. F. Pinter, London.
Freeman, Ch. (1994). The Economics of Technical Change. Cambridge Journal of Economics, 18 (5), 463–514.
Gomułka, S. (1998). Teoria innowacji i wzrostu gospodarczego. CASE, Warszawa.
Grzelak, M.M. (2011). Innowacyjność przemysłu spożywczego w Polsce. Ocena. Uwarunkowania. Rozwój. Wyd. Uniwersytetu Łódzkiego, Łódź.
Kalecki, M. (1986). Teoria dynamiki gospodarczej: rozprawa o cyklicznych i długofalowych zmianach gospodarki kapitalistycznej. PWN, Warszawa.
Karcz, K. (1997). Proces dyfuzji innowacji: podejście marketingowe. Wyd. Akademii Ekonomicznej im. Karola Adamieckiego, Katowice.
Kotler, Ph. (1994). Marketing: Analiza, uwarunkowania, wdrażanie, kontrola. Wyd. Gebethner i S-ka, Warszawa.
Mansfield, E. (1968). Industrial Research and Technological Innovation. W.W. Norton, New York.
Oslo Manual. Guidelines for collecting and interpreting innovation data. III edn. OECD Publishing 2005.
Pietrasiński, Z. (1971). Ogólne i psychologiczne zagadnienia innowacji. PWN, Warszawa.
Pomykalski, A. (2001). Innowacje. Politechnika Łódzka, Łódź.
Poznański, K. (1981). Działalność innowacyjna przemysłu. Elementy diagnozy. PWN Warszawa.
Ricardo, D. (1821). On Machinery. [In:] On the Principles of Political Economy and Taxation. John Murray, London. Retrieved from http://www.econlib.org/library/Ricardo/ricP7.html (access 10.10.2015).
Rogers, E.M. (2003). Diffusion of innovation. Free Press, New York.
Romer, P.M. (1986). Increasing returns and long-run growth. Journal of Political Economy, 94, 5, 1002–1037.
Say, J.B. (1855), Of the Labour of Mankind, of Nature, and of Machinery Respectively. [In:] C.C. Biddle (Ed.), A Treatise on Political Economy, Lippincott, Grambo & Co., Philadelphia. Retrieved from http://www.econlib.org/library/Say/sayT7.html (access 10.10.2015).
Schumpeter, J.A. (1994). Capitalism, Socialism and Democracy. VI edn. Routledge, London and New York.
Siudek, T., Zawojska, A. (2014). Competitiveness in the economic concepts, theories and empirical research. Acta Sci. Pol., Oeconomia, 13 (1), 91–108.
Skawińska, E., Zalewski, R.I. (2009). Klastry biznesowe w rozwoju konkurencyjności i innowacyjności regionów. Świat – Europa – Polska. PWE, Warszawa.
Smith, A. (1904). Of the Division of Labour. [In:] E. Cannan (Ed.). An Inquiry into the nature and Causes of the Wealth of Nations. Methuen & Co., London. Retrieved from http://www.econlib.org/library/Smith/smWN1.html (access 10.10.2015).
Spychalski, G. (1999). Zarys historii myśli ekonomicznej. PWN, Warszawa.
Veblen, T. (2008). Teoria klasy próżniaczej. Warszawskie Wydawnictwo Literackie Muza, Warszawa.

INNOWACJE W TEORII EKONOMII I ROZWOJU MYŚLI EKONOMICZNEJ

Streszczenie. W artykule przedstawiono teorię innowacji występującą w dorobku nauk ekonomicznych. Dokonano przeglądu literatury ekonomicznej pod kątem znaczenia innowacji w różnych nurtach ekonomicznych. Rozważania rozpoczęto od analizy poglądów przedstawicieli nurtu ekonomii klasycznej, m.in. Adama Smitha, Davida Ricardo czy Jean-Baptiste'a Say'a, aż po czasy współczesne, czyli nurt gospodarki opartej na wiedzy. Analizując dorobek myśli ekonomicznej, wykazano wzrost znaczenia innowacji, działalności badawczej, nauki dla rozwoju społeczno-gospodarczego.

Słowa kluczowe: innowacje, wzrost gospodarczy, postęp, nurty ekonomiczne

Accepted for print: 03.11.2015

For citation: Lemanowicz M. (2015). Innovation in economic theory and the development of economic thought. Acta Sci. Pol., Oeconomia, 14 (4), 61–70.

ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

ACTA SCIENTIARUM POLONORUM *Oeconomia 14 (4) 2015, 71–82*

EDUCATIONAL CUSTOMS DUTIES AS A CRUCIAL ELEMENT TO CREATE FREE TRADE

Janusz Myszczyszyn
West Pomeranian University of Technology in Szczecin

Abstract. In the paper, the author indicates, based on an economic model and statistical data analysis, the justification of protectionist policy applied with a particular consideration of the educational customs duty. In accordance with the development stages, of Friedrich List, he indicates that the educational customs duty may be perceived as one of the stages of economic policy, whose ultimate objective is to increase the competitiveness in the domestic market and, in consequence, to join the vortex of free trade. Although, in a short period of time, economic costs of customs duties introduction may be high, practically all states, proponents of free trade, together with Great Britain, promoting their industry conducted in the initial stage of capitalist governance the policy of high customs rates which at the end brought about a change in the system of comparative costs.

Key words: infant industry, free trade, educational customs duties, Friedrich List

INTRODUCTION

In spite of many scholarly papers related to the periods of customs protection, it is difficult to find the consensus as to the economic and social effects as well as the justification for leading such policy. Lack of knowledge in the field of economic history is particularly visible in this aspect, and in the opinion of the author, may contribute to an objective evaluation of the problem.

The necessity to limit the imports of goods to protect one's own market, of the newly established industries included, has been raised for a few hundred years. The idea of positive trading balance was supported by representatives of both mercantilism and physiocracy. The classics of economics also indicated situations, in which the liberal policy (free trade) should be renounced and one's own market protected. In the 19th century, the followers of the protective policy for developing industries were

Corresponding author: Janusz Myszczyszyn, West Pomeranian University of Technology in Szczecin, Żołnierska 47, 71-210 Szczecin, Poland, e-mail: janusz.myszczyszyn@zut.edu.pl

strengthened, among others, by representatives of German historical school, its founder Friedrich List included.

The research hypothesis put forward by him, the educational duties policy – although it seems to be contradictory to the idea of free trade – has always been an important stage of protection for the emerging national industries (infant industry) against the inflow of goods from abroad. The customs barrier for foreign goods allows for the development and increase in competitiveness of the national branches of economy, and in consequence, may contribute to an increase in the global welfare in the future.

A necessary condition to ensure the competitiveness and the consumer's surplus is a gradual renouncing the restrictive customs policy and the application of liberal duties policy together with the free trade policy.

Numerous statistical data on trading exchange and the rates of customs duties were used in the paper in the conditions of the 19th and the beginnings of the 20th centuries, and quite frequently the views of classical economists at the background of F. List's development stages.

RESULTS AND DISCUSSION

Classical theory of trading at the background of Great Britain trading exchange between 1800 and 1910. Free trade idea full bloom and crisis in the 19th century. The classical trading theory was developed at the end of the 18th century and its precursor was the "father of economics", Adam Smith, and its creator David Ricardo. The free trade idea appeared for the first time in 1776 in the book by A. Smith *The wealth of Nations* [Smith 1954]. Smith indicated that the elimination of trading barriers allowed for specialising in those manufacturing branches for which there were the most advantageous conditions in a given country. The basis for the theory was an analysis of differences in the absolute costs of goods production. The absolute edge meant the capacity of a country to produce a larger number of goods from the manufacturing resources owned, compared to the country of competitor. The sources of this edge could be: a common access to advanced technology, a larger effectiveness of resources, a better capacity of labour, etc. [Rynarzewski and Zielińska-Głębocka 2006].

The position of a country, which does not have an absolute edge in the manufacturing of any goods inspired D. Ricardo to do research on relative costs. In his work *On the Principles of Political Economy and Taxation* (1817), he stated that the relative cost of wine manufacturing in Portugal was lower than cloth of manufacturing and therefore, Portugal should specialise in the manufacturing of wine and import cloth from England [Ricardo 1823]. The right of comparative advantages was based on the definition of comparative edge and comparative costs.

The principle of absolute and comparative costs became a foundation for the contemporary theory of international trading.

The economists of a new classical current (for instance Heckscher, Ohlin) searched for the sources of comparative costs in the differences of production factors (payroll, pension, per cent). Their theory of resources abundancy (model 2×2) assumes that a country, manufacturing two goods, apart from labour, uses a relatively cheaper second production factor – the capital or land [Heckscher 1919, Ohlin 1933]. The main conclusion is the

allegation that the countries should export these goods, for whose production a factor more abundant in a given country is used, and it should import those whose manufacturing requires the use of a less abundant factor.

The policy of free trade was the consequence of industrialisation and not its effect, whose distinct example is England, the only country, in which the industrialisation triumphed starting from the 19th century. Although in 1814, the last residue of the craftsmen legislation was abolished, the rural protectionism was added to the system of protective duties related to industrial products (so-called corn-laws) [Kuliszer 1961]. In that period of time, the average duties amounted to: in the USA – from 35 to 45%, in Denmark – from 25 to 35%, in Prussia – from 8 to 12%, in the Netherlands and Belgium from 6 to 8% [Bairoch 1993]. It was only in 1846, facing the crop failure and starvation of many nationals, that England abolished the symbol of agrarian protectionism – the corn laws.

The period the protection in form of educational duties was in force in England was featured by selectivity. At the beginning wool, cotton and iron products were protected. Then, customs duties were introduced on import of other metals, leather, ships, silk. Too long maintenance of customs duties led to the fact that it was only in the mid-19th century that some industries riped to the competition in the domestic and international markets. Therefore, England is an example of gradual and selective liberalisation of trade, in accordance with the concept of infant industry.

Between 1821 and 1825, the net revenues from customs duties amounted to as much as 53.1% of the Great Britain import (in France 20.3%), in the years from 1841 to 1845, they amounted to 32.2% (in France 17.9%), between 1856 and 1860 – 15% (France 10%) [Irwin 2006].

The free trade was not the effect of an increase in the international competitiveness, but in its assumptions, it was depicted that the trade exchange would benefit also weaker participants of exchange.

In the below given figure, the author showed the results of Great Britain's foreign trade between 1800 and 1910 (in million GBP).

In the initial period, despite the effects of the technological revolution only a slow growth of trade can be noticed. The results of industrialisation were the changes in the industry and the development of the domestic market.

In 1840, the value of Great Britain's export was nearly 51.5 million GBP, or a value comparable to 1815. After the same period of 25 years or else in 1865, the value of export already amounted to nearly 166 million GBP, which was a triple increase. Therefore, the relationship between the trading policy after 1849 and the trading results seems to be obvious.

At the same time, after the period of customs duties liberalisation, Great Britain was experiencing a negative balance of foreign trade. Between 1820 and 1850 despite large fluctuations, this balance did not exceed 20 million GBP. After that time, the negative balance systematically increased. The surplus of import over export at the beginning of the 19th century reached one third of the British export and after the first decade of the 20th century, this balance exceeded nearly 60% of export (Fig. 1)[1]. England became the

[1] In the 18th century, Great Britain had a negative balance of trade which was caused by import of colonial goods.

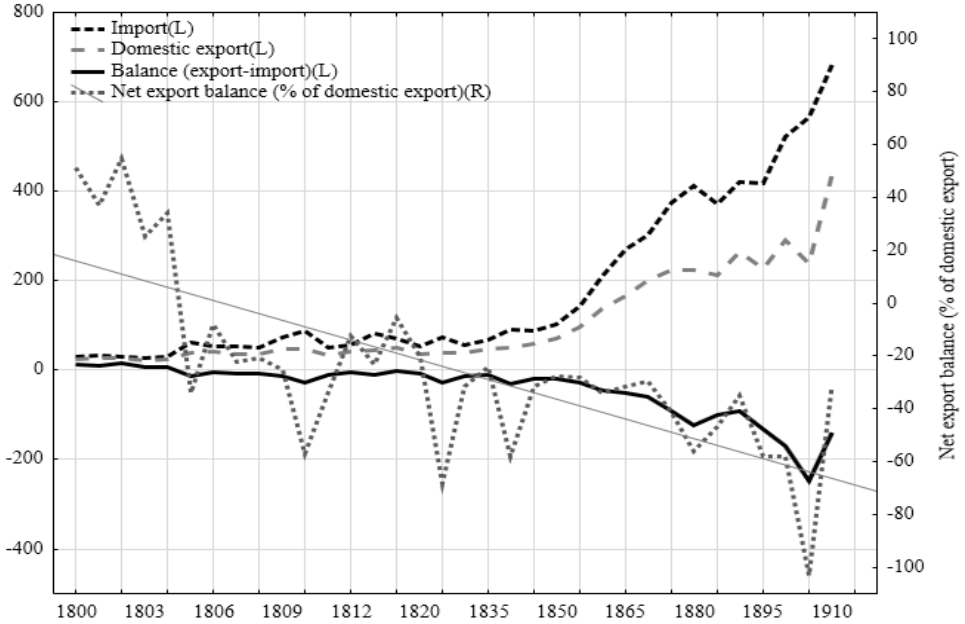

Fig. 1. Results of Great Britain's foreign trade between 1800 and 1910 (in million GBP)
Source: Own calculations based on Mitchell [1988, p. 450–453].

importer of cheap grain, other agricultural products, raw materials, being an exporter of industrial goods.

The period between 1850 and 1870 is the era of free trade in Europe [Capie 1994]. Analysing the average level of customs duties rates between 1857 and 1873, we may notice that Great Britain had the lowest duties for corn and industrial articles – most frequently it was 0% rate and duties rate for wine (other spirits) was an exception, which although high, reaching in 1857 – 69% dropped down to 25.8% in 1873.

Educational customs duty – a simple economic model

The economic evaluation of the effects, arising from the protection of the infant industry is depicted in the two models below. The curves of demand (D) and supply (S) relate to the market of X goods manufactured by the national industry (Fig. 2). For the free trade policy, the global price of X goods amounts to P_W.

The domestic demand at P_W price is D_1 and is completely satisfied by import. The national production at P_W price is zero. The global price is too low, to encourage the domestic production. The government, using the customs tariff, protecting against the inflow of goods from abroad, influences the increase in the domestic price to P_D. The customs tariff shall equal the difference between $t = P_D - P_W$.

The domestic price is sufficiently high to encourage national production at S_2 level. The higher P_D price influences the drop of the domestic demand from D_1 to D_2 and a drop in the import. The import amounts to $D_2 - S_2$ (AB section). In consequence at P_D price:

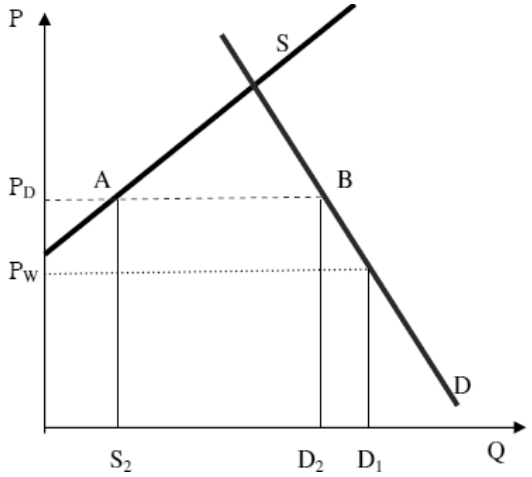

Fig. 2. Free trade policy and customs protection – advantages and costs
Source: Author's own model.

- consumers of goods have a lower consumer's surplus caused by a higher domestic price;
- some consumers renounce the purchase of goods ($D_1 - D_2$);
- new jobs are created in the protected domestic sector of the economy;
- domestic production may release demand for products and raw materials of other sectors;
- the government gains income from customs duty (import), which may bring about benefits to other parts of population.

The net effect of customs tariffs introduction is negative at a short-period of time because consumers have to pay a higher market price, some consumers renounce the purchase, and the volume of exchange is reduced.

After a period of customs protection, the $S \geq S$' supply curve of the national industry shifts (Fig. 3). In reality, such a change is possible and shall take place gradually in time, as an effect of learning, acquiring experience, and by the same, a growth in efficiency.

If it is assumed that the national industry is covered by protection for some time and in the subsequent period, the customs tariff is completely done away with, and the protected industry may produce at the global P_W price, then:

- households achieve the same consumer's surplus as before the introduction of the tariff;
- the government does not gain any resources from duties;
- domestic producers with the global PW price will manufacture the production volume $A = D_1 - S_1$;
- the domestic producers (with a change of the supply curve position) shall gain the producer's surplus;
- the terms of trade of the country will improve.

To sum up, if after a period, the protective customs tariff is in force, producers can adjust to lower (competitive) global prices, the desirable social effect of welfare may be achieved.

The customs tariff protection allows, in a way, the national industry to "grow up", so as to ensure that after the abolition of tariffs, the national producers will compete on equal bases with developed countries.

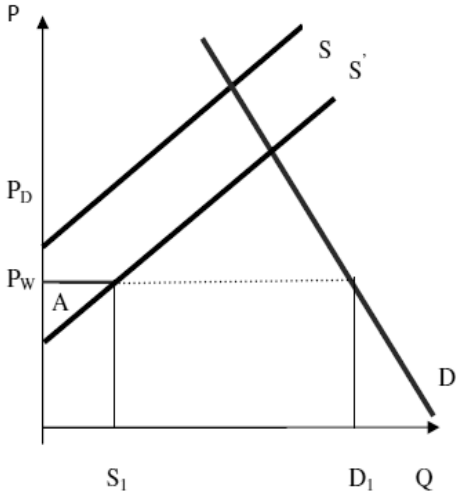

Fig. 3. Free trade policy and protective customs duties – effect of national growth in supply
Source: Author's own model.

Another argument for the followers of the protection of industry is to stimulate the effects of learning, which contribute to the improvement in the efficiency and effectiveness. The results of learning may be translated into the remaining sectors of the economy, through the so-called spill-over effect, or in other words spreading over. The industry, being established and developed, contributes to the development of other industries, for instance, the development of railway increased the demand for iron, steel, coal, machines, leading to the development of the metallurgical industry, machine industry, excavation industry and deepened the demand for labour [Myszczyszyn 2013].

The industrialisation and the growth of gross domestic product (GDP) are, by the same, stimulated by the initial protection of the domestic industry. This proves that although the customs protection could be detrimental to the national prosperity in a short period of time, its positive effects could, however, have a prevailing impact in a longer period of time, also on the global economy.

A threat, arising from such protectionist policy may come from the politicization of the protection process, exertion of influence on decidents and sustaining high tariffs in a longer period of time (lobbing). In consequence, the protection may prove to be permanent, and the industries shielded by the wall of protectionism develop in a deformed and inefficient form and are doomed to painful adjustment, when in the end, they are forced to compete with external goods. In such a case, a production subsidy addressed to enterprises, which generate positive effects of learning would be more efficient.

Educational customs and stages of national economic development by F. List

Friedrich List did not approve of the concepts favoured by classics of economics. He was not an adversary to the free trade but considered the weaker and less competitive economy should be protected to be able to compete with other participants in the future. Great Britain was an example seen from the prospect of its trade exchange with the Netherlands.

Paul Bairoch states vividly that at the beginning of the 19th century, the policy of free trade made in Europe only few isles on the surrounding ocean of protectionism.

Arguments for the protection of "infant industries" were presented a little later than the theory of Smith, among others by Hamilton (1790). Hamilton, as a secretary of state of the USA tried to promote the young American manufacturing industry with the use of protective tariffs (*The Tariff Act of 1789*). In addition, Hamilton as an advisor of president Washington realized that customs were an important source of revenues of the State [Menzel 2009].

In the USA, the customs tariffs were changed many a time, for instance the years from 1824 to 1832 were characterised by a high level of protection, e.g. cotton and wool products were charged with customs duties of 33.3% of their value [Menzel 2009]. Between 1833 and 1842 a liberalisation of the American customs tariff can be noticed, but in the subsequent years 1843 to 1846 the protection path was restored. In those years, the customs tariff was on average about 30%, but for industrial products it was much higher. For instance, the customs tariff for pig iron was 72%, for manufactured iron products 163%, and for cotton products 95%.

In the United States, the liberalisation of trade occurred in 1846 after the customs tariff was introduced by the then Treasury Secretary, Robert Walker (the so-called Walker--Tariff). It was the result of a coalition of growers from the South and producers of cereals from the West of the USA. In view of the corn laws abolition by Great Britain, the growers could export agricultural produce, and at the same time import on convenient terms English industrial products. This policy of the USA was maintained for about 15 years, but their own industry being established in the Northern States, they expected a more strengthened policy against free trade.

The founder of the German historical school in economics F. List, mentioned earlier, developed the theory of exchange in the economy of German States.

Hence, it is not surprising that in W.H. Dawson's book: *Protection in various countries: Germany* the author claimed directly that the fiscal policy of German states, the interest of the industry and agriculture of the future empire taken into account, had a protectionist character from definition [Dawson 1904, Bairoch 1993].

Friedrich List – a Professor of the Tübingen University, who for liberal political ideas, inciting against the existing state institutions included, was deprived of his chair (1819) and forced to emigrate (1822), in the end was incarcerated in the fortress of Asberg, and released after a few months on condition of renouncing his nationality and emigration (to the USA), was a proponent of the political and economic integration of many German states.

List published his famous work *Das nationale System der politischen Oekonomie (The National System of Politic Economy)* (1841), in which he gave, among other things, his evaluation and position on the assumptions of the classic school in the economy, the assumptions of the free trade included.

He set out in a manner characteristic for him that the nation is the basis for the economic system created thereby, differentiated from the classics of the economies. He emphasised that the nature of a nation bridges the gap between an individuality and the whole humanity [List 1910] ("Als charakteristischen Unterschied des von mir aufgestellten Systems bezeichne ich die Nationalität. Auf die Natur der Nationalität als des Mittelgliedes zwischen Individualität und Menschheit ist mein ganzes Gebäude gegründet").

F. List in Chapter 32 (*Das Tauschwertsystem Adam Smith*) of his work underlines the fact that A. Smith, creating the theory of exchange ignored the nature of nations, nearly completely passing over the politics and state authority, he assumed a permanent peace and a universal union, not appreciating the development of domestic production capacities, and at the same time, he demanded free trade [List 1910]. Furthermore, Smith put on an equal footing private prosperity and social welfare, when List emphasised the important element of the nation.

In chapter 34 of his work (*Die Insularsuprematie und die deutsche Handelsunion)* List gives his arguments referring to the protection of the domestic market. At the same time, he shows the national interest, arising from establishing the German Customs Union (1834) and the application of the policy of internal market protection against competition (mainly English) by the customs tariff system. He cites J. Bowring, an English economist, suggesting that the policy of protective high customs duties related to domestic industrial products is appropriate and the prices of protected goods themselves may be lower than foreign ones. He emphasises that the internal competition between domestic producers and, at that time, the protection against foreign competition may be a factor leading to the achievement of an economic miracle [List 1910].

There are no illusions that the trading exchange of a country, relying on export of agricultural produce and raw materials will not ensure the strength, welfare and importance of such a country. It must fight for the development and growth of its industrial production, the growth of industrial products export included, with the simultaneous raw material import [List 1910].

In the development of a domestic economy related to internal trading, F. List distinguished a few stages, starting from most primitive and ending on the most developed (English) economy:

1) agricultural development; in consequence of industrial products import and raw material and agricultural produce export;
2) development of the own (domestic) industry besides import of goods from foreign countries;
3) protection of the country's industry and, to a significant extent, of its own market of industrial products;
4) export of a significant part of domestic industrial products and import of raw materials and agricultural produce.

According to List, the German Customs Union States achieved in mid-19th century the third stage, hence the demand to protect the domestic industry. At the same time, he criticises in many parts of his work the British protection policy, for instance, based on corn laws, so detrimental to the export of, for instance, Prussian wheat.

List assumed that in a short period of time, the prices of protected domestic goods could actually grow, but it was in the national interest to get them lowered as a result

of internal competition, so as to be able to conduct a successful open free trade in the future.

The protection of the domestic industry by the introduction of a customs tariff shall be maintained as long as the national industry is exposed to the activity of foreign competition. Customs duties must grow if the domestic consumption of foreign industrial goods is based mostly or completely on import [List 1910].

One of the most important arguments for the protection of the domestic market was the establishing of convenient conditions to built and develop new industries, in particular, in less or weakly developed countries. The authors of the theory drew attention to the fact that new enterprises had insignificant opportunities to compete efficiently with companies from developed countries (for instance Great Britain, Belgium). Companies from developed countries acted longer and with the time, they managed to work out methods of industrial production, and increase the efficiency of their production. They had a better quality of information and knowledge on the production process, they were better familiarised with the market, labour market included, and what is most important, their products could be relatively cheaper than "new comers". In consequence, the existing companies could sell their goods at a lower price in the international markets and continue to have profitable production.

For instance – the domestic supply of metallurgical industry articles necessary for the development of Prussian industry, pig iron included, was insufficient and hence pursuant to the customs tariff of 26 May 1818 and from subsequent years, the customs duty was abolished.

The economy of the second stage of development needed relatively cheap goods. Only in 1844, facing the development of the domestic industry and strong competition on behalf of English products in the area of the states associated in *Zollverein*, the customs duty at an amount of 20 marks (RM) was imposed on each tonne of pig iron. The customs tariff protection allowed for the development and progress in the metallurgy. The duty was lowered only in 1865 after the trading agreement was signed with France and it amounted to 15 RM, and after signing a trading agreement with Austria (1868) it dropped to 10 RM. The new customs tariff from 1870, which was the effect of free trade policy, assumed a drop in the duties rates for pig iron to 5 RM per tonne. The customs tariffs were abolished from October 1873 [Kestner 1902]. On principle in 1873, the states associated in the German Customs Union produced over 2.2 million Mg of pig iron, which constituted already 14.9% of the global production. Besides Great Britain, Germany was the largest exporter of pig iron [Kestner 1902].

The estimated exponential trend for domestic production[2] (Fig. 4): allows to claim that in German economy between 1825 and 1879, the average growth rate of domestic pig iron production was 7.74% *per annum*. With the protection, the export of pig iron from the states of the German Union amounted to 10% (1834), and in 1879 it was 45%, the import correspondingly was 18 and 20%.

[2] Domestic production = 39,216 × exp (0.0774x).

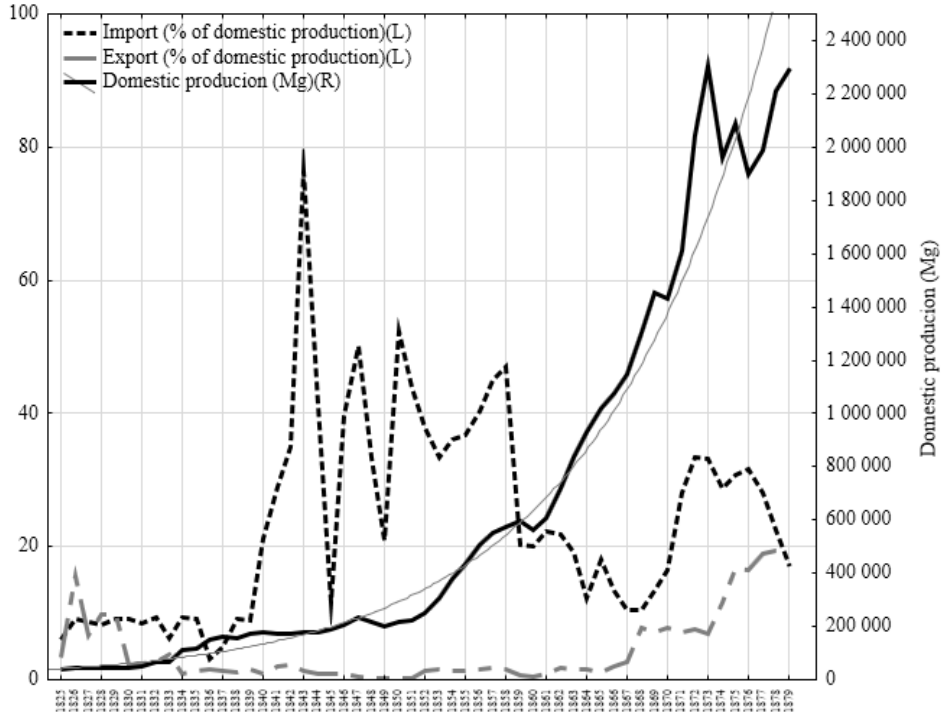

Fig. 4. Zollverein, German Reich – production, export and import of pig iron (1825–1880)
Source: Author's own calculations based on Kestner [1902, pp. 290–299].

CONCLUSIONS

The educational customs duties remain still a very important argument for the protectionist policy.

The protection of the domestic industry was applied by many world countries at the beginning stage of their development, Great Britain and the USA included. Despite the lapse of many years, such a protection has been frequently practised also today by less developed economically countries.

The idea of educational customs duties is not contrary to the idea of comparative costs because it is the purpose of the initial protection to achieve a maturity of the domestic industry so as to compete in the future with more competitive economies. In contrast to the theory of comparative costs, the presented model of educational customs rates is an example of a dynamic analysis as in a longer period of time, the abolition of the customs protection may lead to the introduction of the policy of free trade, at the same time, having an impact on an increased welfare in the domestic and global levels.

In case of the German Customs Union Economy, despite the strong scholarly support of the historical school, the member states of the Union (and the unified Germany) had applied the protectionist policy up to the end of the 1870s in a moderate form [Blackbourn 1997].

Friedrich List noticed the importance of the international trade for the poor and backward Germany, with a relatively late take-off. For infant industries, it became necessary to be protected against foreign competition, mainly English. List perceived the trading policy, as one element from the whole set of producers, taking into account the industrial, financial and educational policies [List 1910]. Despite the initial protection, the 1860s are rightly defined as the period of gold free trade [Sally 2008]. The crisis after 1873 (in Europe) as a response to the depression and the effect of request of selected producers' groups (e.g. iron and rye union in Germany). At that time Great Britain was the only country, which continued the policy of free trade.

REFERENCES

Bairoch, P. (1993). Economics and World History – Myths and Paradoxes. Brighton, Wheatheaf.
Blackbourn, D. (1997). The Fontana History of Germany, 1780–1918. Fontana Press, London.
Capie, F. (1994). Tariffs and growth: some illustrations from the world economy, 1850–1940. Manchester University Press, Manchester.
Dawson, W.H. (1904). Protection in various countries: Germany. King & Son Orchard House Westminster, London.
Irwin, D. (2006). Free trade and protection in nineteenth-century Britain and France revisited: a comment of Nye. [In:] J.P. Dormois, P. Lains (Eds). Classical Trade Protectionism 1815–1914. Taylor & Francis, e-Library, 15.
Flejterski, S. (2003). Ekonomia globalna. Synteza. Difin, Warszawa.
Heckscher, E. (1919). The Effect of Foreign Trade on the Distribution of Income. Ekonomisk Tidskrift, 21.
Kestner, F. (1902). Die deutschen Eisenzölle 1879–1900. Staats- und socialwissenschaftliche Forschungen. G. Schmoller (Ed.). Bd. 21, book 3. Publisher Druncker und Humblot, Leipzig, 172.
Kuliszer, J. (1961). Powszechna historia gospodarcza średniowiecza i czasów nowożytnych. Vol. II. KiW, Warszawa.
List, F. (1910). Das Nationale System der politischen Oekonomie. Zweite Auflage,Verlag von G. Fisher, Jena, 40, 70–73, 454, 499–500, 516.
Menzel, U. (2009). Imperium oder Hegemonie? Groβbritannien 1783–1919: Das Zwite Empire – Folge 12. Forschungsberichte aus dem Institut für Sozialwissenschaften ISW. Technischer Universität Braunschweig, 93, 40.
Mitchell, B. (1988). British Historical Statistics. Cambridge University Press, Cambridge.
Myszczyszyn, J. (2012). Przesłanki i ekonomiczne konsekwencje polityki protekcjonistycznej na przykładzie „unii żyta i żelaza". Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, 246.
Myszczyszyn, J. (2013). Wpływ kolei żelaznych na wzrost gospodarczy Niemiec 1840–1913. Wydawnictwo Uniwersytetu Łódzkiego, Łódź.
Ohlin, B. (1933). Interregional and International Trade. Harvard University Press, Cambridge.
Ricardo, D. (1823). On the Principles of Political Economy and Taxation. 3rd edn. John Murray, London.
Rynarzewski, T., Zielińska-Głębocka, A. (2006). Międzynarodowe stosunki gospodarcze. Teoria wymiany i polityki handlu międzynarodowego. PWN, Warszawa.
Sally, R. (2008). Trade Policy, New Century. The WTO, FTAs and Asia Rising. The Institute of Economic Affairs, London. Retrived from: http://www.iea.org.uk/sites/default/files/publications/files/upldbook432pdf.pdf.

Smith, A. (1954). Badania nad naturą i przyczynami bogactwa narodów. PWN, Warszawa.

CŁO WYCHOWACZE JAKO ISTOTNY ELEMENT TWORZENIA WOLNEJ WYMIANY HANDOWEJ

Streszczenie. W publikacji autor, wykorzystując model ekonomiczny i analizę danych statystycznych, ocenia zasadność stosowania polityki protekcjonizmu ze szczególnym uwzględnieniem cła wychowawczego. Zgodnie ze stadiami rozwoju Friedricha Lista wskazuje, że cło wychowawcze może być postrzegane jako jeden z etapów polityki gospodarczej, którego ostatecznym celem jest zwiększenie konkrecyjności na rodzimym rynku i w rezultacie włączenie się w wir wolnego handlu. Choć w krótkim okresie ekonomiczne i społeczne koszty wprowadzenia ceł mogą być duże, to praktycznie wszystkie państwa orędownicy wolnego handlu łącznie z Wielką Brytanią, promując swój przemysł, prowadziły w początkowym etapie budowy ładu kapitalistycznego politykę wysokich stawek ceł, co w końcu doprowadziło do zmiany układu kosztów komparatywnych.

Słowa kluczowe: polityka infant industry, wolny handel, cło wychowawcze, Friedrich List

Accepted for print: 10.10.2015

For citation: Myszczyszyn J. (2015). Educational customs duties as a crucial element to create free trade. Acta Sci. Pol., Oeconomia, 14 (4), 71–82.

ACTA SCIENTIARUM POLONORUM
Oeconomia 14 (4) 2015, 83–92

ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

THE IMPORTANCE OF NON-AGRICULTURAL ECONOMIC ACTIVITY OF FARMERS IN THE MODERNIZATION PROCESS OF FARMS

Artur Ostromęcki, Dariusz Zając
University of Rzeszów

Andrzej Mantaj
University of Information Technology and Management in Rzeszów

Abstract. The aim of this article is to identify and assess the degree and conditionings of the phenomenon of subsidizing farms from the income obtained by farmers from their non-agricultural economic activity. The empirical material of the article are the results of the survey conducted in 2011–2012, i.e. the questionnaire interview with 210 farmers, owners of individual farms, additionally engaged in non-agricultural economic activity, from the area of south-east Poland, i.e. from three voivodships: Świętokrzyskie, Małopolskie and Podkarpackie. The analysis of the research results shows that the processes associated with running a farm, which are important from the farmers' point of view, are supported financially from the income obtained by them from non-agricultural economic activity, as evidenced by statistically significant and positive parameters of logistic regression of the models presented in the article, in almost all the analyzed cases.

Key words: non-agricultural economic activity of farmers, subsidizing a farm, logistic regression

INTRODUCTION

Today, agriculture has ceased to play the major role in the economy and social sphere of rural areas, although there are still strong links between agriculture and the rural economy. More and more new forms of non-agricultural economic activity emerge in rural areas next to agricultural activities. As a result, the level and dynamics of development

Corresponding author: Artur Ostromęcki, University of Rzeszów, Department of Economic Policy, Faculty of Economics, M. Ćwiklińskiej 2, 35-601 Rzeszów, Poland, e-mail: arturo@univ.rzeszow.pl

of these areas are no longer determined by agriculture mainly, but they are increasingly determined by non-agricultural economic activity [Zegar 2000, Woś 2002, Hunek 2006, Rizov 2006, Czudec 2009, *Agriculture for Development*… 2010].

In the relations between agriculture and rural areas and non-agricultural sectors of the rural economy the following scenarios are theoretically possible [Czudec 2009]:

- agriculture as an important segment of rural economy, occupying a permanent place in the structure of agribusiness, but at the same time generating a negative impact on rural areas (degradation of natural environment, disappearance of biodiversity, depopulation of villages, etc.);
- agriculture as an important segment of rural economy, providing both the villagers and the whole society with public goods by implementing environmental, social and cultural functions;
- agriculture supplying rural economy with productive factors, i.e.: resources of labour, land and capital, used in non-agricultural economic activity and thus contributing to making the development of rural areas more dynamic;
- agriculture functioning as a result of implementation by the village of new, non-agricultural functions, so that the villagers not engaged in it and people coming to the village as tourists create a demand for goods and services supplied by them;
- agriculture, due to taking over by the rural areas of new, non-agricultural functions, becomes marginalized and ceases playing an important role in the rural environment.

It should be added that none of the above scenarios ultimately excludes the possibility of the development of multifunctional agriculture and rural areas, and implementation of the last four increases the need for taking on new functions by agriculture [Czudec 2009].

From the point of view of multifunctionality of agriculture and rural areas, non-agricultural economic activity of farmers and agricultural population is particularly important. In connection with the development of this activity on farms a new non-agricultural function appears – it means the subordination of the agricultural family and household, and often also the farm, to a non-agricultural company. At the same time, the relations between the farm and non-agricultural economic activity can be of two-fold character, i.e. complementary or competitive.

If non-agricultural activity is of complementary character to agriculture (e.g. agritourism, food processing, agricultural services, etc.), then there is a chance for a harmonious development of both spheres. Pro-agricultural nature of a non-agricultural enterprise stimulates and enhances the agricultural function of the farm. It also contributes to good conditions for development of new functions of agriculture. This can curb the process of deagrarization of rural economy, manifesting itself, i.a., in disappearance of productive functions in a large part of farms. Moreover, due to this it becomes possible for the village to maintain its valuable environmental, social and cultural qualities. It is also possible to effectively solve the problem of low incomes of agricultural people and enrich the traditional values of the rural environment in this way.

The course of events and the complex of consequences is quite different if the new non-agricultural enterprise is not connected with agriculture and is created "next to" the farm, performing the competitive function towards it. This competition focuses mainly on the labour factor, bringing in consequence the extensification of agricultural production,

the reduction or elimination of animal husbandry, followed by fallowing the land and the change in the function of farm buildings which are used for non-agricultural activity. As a result, it usually means permanent abandonment of the hitherto existing model of running the farm. If this leads to transfer of land to farms with development prospects (i.e. able to regenerate their production potential), then this is a desirable process from the point of view of the need for structural changes in agriculture. However, in the opposite situation, when land is fallowed, it reinforces the process of deagrarization of villages, and results in exclusion of high quality lands from agricultural production, which is a definitely negative effect of these changes.

Thus, starting up and running non-agricultural economic activity by farmers and agricultural population and getting in this way of income from non-agricultural sources may affect the farm in two ways. Namely, it can stimulate agricultural production, e.g. through the support with additional financial means or, on the contrary, it may weaken the interest of farmers in its intensification. This fact is related to the free flow of capital between the farm and the additional non-agricultural economic activity. This may also lead to a conflict of functions performed on the farm. Thus, non-agricultural enterprises of farmers and agricultural population, depending on their nature, may become both an opportunity for the development of the farm (agriculture), as well as a threat to this process [Tomczak 1994, Sikorska-Wolak 1995, Orłowska 1998, Makarski 1999, Czudec 2009].

AIM, EMPIRICAL MATERIAL AND RESEARCH METHODS

The aim of this article is to identify and assess the degree and conditioning of the phenomenon of subsidizing the farm from the income obtained by farmers from their non-agricultural economic activity.

The empirical material of the article are the results of surveys conducted in 2011–2012 (i.e. the questionnaire interview with 210 farmers, owners of individual farms additionally engaged in non-agricultural economic activity). Surveys were of partial-representative research character (purposive-random sampling). The unit of the sample were individual farms with non-agricultural economic activity, from the area of south-east Poland, i.e. from three voivodships: Świętokrzyskie, Małopolskie and Podkarpackie[1]. The area for research was selected based on the division of Poland into agricultural regions by W. Michna [1998, 1999]. It includes megaregion I, subregion b, i.e. the region of the overpopulated village and fragmented agricultural structure of farming. Such a spatial scope of the research was of purposive character as it was hypothetically assumed that multifunctional development of village and agriculture is necessary and desirable in the area of agriculture with fragmented structure of farms with a particular role of farmers' non-agricultural economic activity.

Farm management involves many different aspects, and each of them is associated with incurring some costs. The conducted research confirmed the occurrence of the

[1] The survey was conducted within the realization of the habilitation research project N N114 191240, financed by Narodowe Centrum Nauki w Krakowie (National Centre of Science in Krakow), under supervision of dr Dariusz Zając.

phenomenon of subsidizing the farm from the income obtained by farmers in non-agricultural activity, and the expenditures are related to: purchase of land, charges for hired labour, purchase of fixed and current means of production, enlarging population of livestock animals, fees for production services provided by external entities, payment of taxes and repayments of loans taken out for the needs of the farm. In this connection the above expenditures may or may not have occurred, the variables describing them are of dichotomous character. Against the background of these variables there were examined, in turn, age and education of the farmer, the number of people in the farming family, resources and quality of land used for agriculture, the nature of agricultural production and the rate of its marketability and the share of the farm and non-agricultural economic activity in the structure of the agricultural family's livelihoods. For this purpose, logistic regression was used [Mach 2010] which allowed determining the degree of probability of financial support of the farm from the income obtained by farmers from non-agricultural activity, taking into account the circumstances of this phenomenon.

The equation of logistic regression model can be expressed as [Stanisz 2006]:

$$P(Y = 1 \mid x_1, x_2, ..., x_k) = \frac{e^{a_0 + \sum_{i=1}^{k} a_i x_i}}{1 + e^{a_0 + \sum_{i=1}^{k} a_i x_i}}$$

where: x_i – independent variables;
a_i – regression coefficients ($i = 0, 1, \ldots, k$).

Structural parameters of the model were estimated by quasi-Newton method for maximum likelihood estimation. The regression coefficients in this model allow determining the odds ratio with respect to the variable at which it is in the equation, i.e. the so-called exposed variable, assuming that the other independent variables will not change, acting as control variables.

The so-called odds ratio for the unit change refers to the situation where the value of the independent variable x_i will increase by one unit. It expresses the odds ratio of occurrence of the event described by the dependent variable before and after the increase in the size of the independent variable by the unit, and it is described by the expression e^{a_i}.

To the model there were accepted independent variables where the parameters a_i proved to be statistically significant. The null hypothesis assuming that these parameters are equal to zero, was verified with the use of the statistics of Student's t-test. It was rejected when $t \geq t_{\alpha, n-k}$, where $n - k$ is the number of degrees of freedom of changes, n – the number of observations and k – the number of parameters being estimated in the equation.

In order to evaluate the matching of the model there were used the so-called logarithm of likelihood and McFadden's ratio. The logarithm of likelihood is calculated as the –2log difference from the likelihood function of the obtained model and the –2log from the likelihood function of the model containing only the intercept. The statistics designated

in that way, with distribution close to χ^2, is used to verify the null hypothesis that all the parameters of the model in the population are equal to zero. In turn, the so-called McFadden's pseudo R^2 coefficient is determined by the formula:

$$R^2_{McFadden} = 1 - \frac{\ln L_p}{\ln L_0}$$

where L_p and L_0 are respectively the value of the likelihood function of the obtained model and the model containing only the intercept. The value of this ratio, indicating how more suited to the empirical data is the model adopted for the analysis in relation to the model, in which the explanatory variable is the constant only, is in the range 0–1, and its size decreases with the increase in number of observations.

RESULTS

The analysis of research results will start by the assessment of the phenomenon of subsidizing the purchase of land from the income obtained by farmers from non-agricultural activity. It should be assumed that land, as the primary factor of production in agriculture, is of particular importance. It turns out that the use of funds obtained from non-agricultural activity for increasing the resources of land occurred in two cases. It grew in the statistically proven manner with the improvement of the quality of land on the farm expressed by the soil valuation indicator and with the increase in the share of the income from the farm in the structure of livelihoods of the agricultural family. With the improvement of the quality of land by one point of the soil valuation indicator there increased by an average of more than five times the chance for financing the purchase of land from the income obtained from non-agricultural activity, and this chance increased 1.05 times with the increase of 1% of the share of the income from the farm in the structure of the livelihoods of the family (Table 1). Thus, in subsidizing of this expense to the farm from non-agricultural sources more interested are the farmers owning better quality land used agriculturally and obtaining higher incomes from agriculture. It should be added that the size of the test probability p for the statistics χ^2 was equal to 0.0001, and McFadden's ratio took the value of 0.2 proving a good matching of discussed model.

Table 1. Characteristics of the conditions of subsidizing the purchase of land from the income obtained by farmers from non-agricultural activity

Specification	Soil valuation indicator	Share of income from farm in structure of livelihood of family
Regression coefficients	1.68[a]	0.05[a]
Test probability p for statistics of test t	0.02	0.03
Odds ratio for unit change	5.34	1.05

[a] – significance at probability $p = 0.05$.

Source: The authors' elaboration on the basis of the survey on farms (questionnaire interview with farmers).

In turn, subsidizing hired labour charge from the income obtained by farmers from non-agricultural activity proved to be positively associated with the area of the farm and with the share of income from this activity in the structure of livelihoods of the family. In the first case, the increase of the variable by 1 ha of farmland caused a 1.13-fold increase, and in the second case the increase of the variable by 1% caused a 1.12-fold increase in the chance for subsidizing hired labour charge from the income obtained from non-agricultural activity. In contrast, this relation shaped differently as to the age of the farmer as with the increase in age by one year, the chance for subsidizing hired labour charge from the income obtained from non-agricultural activity decreased to 0.78 of its size for the farmer younger by one year (Table 2). Thus, in subsidizing this expense to the farm from non-agricultural sources more interested are younger farmers, from farms larger in area and obtaining a higher income from non-agricultural economic activity. It should be added that the size of the test probability p for the statistics χ^2 was equal to 0.00001, and McFadden's ratio took the value of 0.47, proving a good matching of this model.

Table 2. Characteristics of the conditions of subsidizing hired labour charge from the income obtained by farmers from non-agricultural activity

Specification	Farm's area	Share of incomes from non-agricultural activity in the structure of family's livelihoods	Farmer's are
Regression coefficient	0.12[a]	0.11[b]	–0.25[a]
Test probability p for statistics of test t	0.01	0.009	0.012
Odds ratio for unit change	1.13	1.12	0.78

[a] – significance at probability $p = 0.05$, [b] – significance at probability $p = 0.01$.

Source: The authors' elaboration on the basis of the survey on farms (questionnaire interview with farmers).

The data contained in Table 3 show that to the improvement of land quality by one point of soil valuation indicator there corresponds, on average, more than four times greater chance for subsidizing repayment of loans, taken for the needs of farm, from the income obtained by farmers from non-agricultural activity, while it increases 1.05 times with the increase by one percent of the share of income from the farm in the structure of livelihoods of the agricultural family. Therefore, it should be concluded that in subsidizing this expense to the farm from non-agricultural sources more interested are the farmers owning better quality land used agriculturally and obtaining higher incomes from agriculture. For this model the size of test probability p for the test statistics χ^2 was equal to 0.0002, and McFadden's ratio took the size of 0.18, therefore it meets the criteria for a good matching with the empirical data.

In the case of subsidizing the charge for production services rendered by third parties on the farm from the income obtained by farmers from non-agricultural activity, it turns out that it is statistically significantly associated only with the share of the income from the farm in the structure of livelihoods of the family. To the increase in the share

Table 3. Characteristics of conditionings of subsidizing repayment of loans, taken for the needs of the farm, from the income obtained by farmers from non-agricultural economic activity

Specification	Soil valuation indicator	Share of incomes from farm in the structure of family's livelihoods
Regression coefficient	1.48[a]	0.05[a]
Test probability p for statistics of test t	0.03	0.03
Odds ratio for unit change	4.39	1.05

[a] – significance at probability $p = 0.05$.

Source: The authors' elaboration on the basis of the survey on farms (questionnaire interview with farmers).

of this income by 1% there corresponds 0.96 of the chance for subsidizing this expenditure. From this fact it appears that farms of a higher share of income from the farm in the structure of livelihoods of the family are more self-sufficient in this regard. Thus, in subsidizing this expense to the farm from non-agricultural sources more interested are the farmers obtaining lower incomes from agriculture and higher incomes from non-agricultural activity. Logistic regression coefficient of the model describing this relation took the value –0.04, the test probability p of the test statistics t 0.04, of the statistics χ^2 0.0002, while McFadden's ratio was equal to 0.1.

Among the expenses on farm management, included in the research, there are still two which turned out to be statistically significantly associated with subsidizing from the income obtained by farmers from non-agricultural activity. They are: the purchase of fixed assets and payment of taxes. In both cases, subsidizing them is in a positive manner dependent on the share of the income from non-agricultural activity in the structure of livelihoods of the family (Table 4).

For the increase by 1% in the share of the income from non-agricultural activity in the structure of livelihoods of the family, the chance for subsidizing the purchase of fixed assets increases 1.035 times, and for subsidizing payment of taxes 1.05 times. Odds ratios do not actually take large values in these cases, but it should be noted that they refer to one-percent increases in the share of the income from non-agricultural activity, and further more they indicate that with their increasing sizes the farmers subsidize from this source both the purchase of fixed assets as well as payment of taxes related to the farm (Table 4). Therefore, it should be concluded that in subsidizing these expenses more interested are the farmers obtaining a higher income from their non-agricultural economic activity. For the model in which the dependent variable was the purchase of fixed assets, the size of the test probability p for the statistics χ^2 was equal to 0.01, and McFadden's ratio took the size of 0.05. In the model with the dependent variable describing payment of taxes, the size of the test probability p for the statistics $\chi^2$was also equal to 0.01, and McFadden's ratio took the size of 0.05. Thus, in both cases the model meets the criteria for a good matching with the empirical data, although the relations between the variables analyzed were not as clear as before.

Table 4. Characteristics of conditionings of subsidizing the purchase of fixed assets and payment of taxes related to the farm from the income obtained by farmers from non-agricultural economic activities according to their share in the structure of livelihoods of the family

Specification	Purchase of fixed assets	Payment of taxes
Regression coefficients	0.03[a]	0.02[a]
Test probability p for statistics of test t	0.004	0.03
Odds ratio for unit change	1.035	1.05
Test probability p for statistics of test χ^2	0.01	0.01
McFadden's ratio R^2	0.08	0.05

[a] – significance at probability $p = 0.01$.

Source: The authors' elaboration on the basis of the survey on farms (questionnaire interview with farmers).

Other variables included in the research, i.e. expenses on purchase of current means of production and associated with increase in livestock population, showed no statistically significant relations with subsidizing them from the income obtained by farmers from non-agricultural activity. It should also be noted that this subsidizing did not appear related, in any of the examined cases, to the farmer's education, the number of persons in the agricultural family, or to the type of agricultural production and its marketability.

CONCLUSIONS

The analysis of research results shows that the processes, which are important from the point of view of farmers, associated with running a farm, are supported financially from the income obtained by them from non-agricultural economic activity. This is evidenced by statistically significant and positive parameters of logistic regression of the presented models in almost all analyzed cases. The article shows, among other things, the presence of only positive and statistically significant relations between the share of income from non-agricultural activity of farmers in the structure of livelihoods of their families and subsidizing from this source the expenses incurred on the farm related to charges for hired labour, purchase of fixed means of production and payment of taxes. All this may mean that these two spheres of economic activity of farmers, i.e. agricultural and non-agricultural, are interrelated, and often the functioning and development of the farm to a large extent depend on the possibility to subsidize it from non-agricultural sources. Finally, it should be concluded that the logistic regression model used in the article can be a useful tool for the analysis of economic and organizational dependencies occurring on farms with non-agricultural economic activity.

REFERENCES

Agriculture for Development, 2010. The World Bank, Washington.
Czudec, A. (2009). Ekonomiczne uwarunkowania rozwoju wielofunkcyjnego rolnictwa. Prace Naukowe Wydziału Ekonomii Uniwersytetu Rzeszowskiego, Monografie i Opracowania 6. Wydawnictwo Uniwersytetu Rzeszowskiego, Rzeszów.
Hunek, T. (2006. Dywersyfikacja aktywności „rolniczej Polski". [In:] T. Hunek (Ed.), Perspektywy rolniczej Polski w Unii Europejskiej – 25. Wieś Jutra, Warszawa.
Mach, Ł. (2010). Zastosowanie regresji logistycznej do określenia prawdopodobieństwa sprzedaży zasobu mieszkaniowego. [In:] R. Knosal (Ed.), Komputerowo Zintegrowane Zarządzanie. Vol. II. Oficyna Wydawnicza Polskiego Towarzystwa Zarządzania Produkcją, Politechnika Opolska, Opole.
Makarski, S. (1999). Uwarunkowania i rezultaty rozwoju przedsiębiorczości w agrobiznesie. Roczniki Naukowe SERiA, 1, 3.
Michna, W. (1998. Zróżnicowanie regionalne wsi i rolnictwa a poziom subsydiowania kredytów. IERiGŻ, Warszawa.
Michna, W. (1999). Założenia do polityki regionalnej państwa w sferze rolnictwa i obszarów wiejskich w pierwszej dekadzie XXI wieku. Roczniki Naukowe SERiA, 1, 1.
Orłowska, A. (1998). Funkcje pozarolnicze w przedsiębiorstwie rolniczym. [In:] Materiały z V Kongresu SERiA.
Rizov, M. (2006). Rural Development Perspectives in Enlarging Europe: The Implications of CAP Reforms and Agricultural Transition in Accession Countries. European Planning Studies, 14, 2.
Sikorska-Wolak, I. (1995). Przedsiębiorczość jako przejaw innowacyjności. [In:] Doradztwo rolnicze a kształtowanie się przedsiębiorczości rolników. SGGW – Katedra Doradztwa Rolniczego, Warszawa.
Stanisz, A. (2006). Przystępny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny. [In:] Modele liniowe i nieliniowe. Vol. 2. StatSoft, Kraków.
Tomczak, F. (1994). Doświadczenia ewolucji rolnictwa rodzinnego w kraju o gospodarce rynkowej. SGH, Warszawa.
Woś, A. (2002). Przestrzeń ekonomiczna rolnictwa. IERiGŻ, Warszawa.
Zegar, J.St. (2000). Kierunki rozwoju rolnictwa i obszarów wiejskich – uwarunkowania regionalne. [In:] A. Stasiak (Ed.), Możliwości wielofunkcyjnego rozwoju wsi polskiej w kontekście integracji z Unią Europejską. KPZK PAN, Warszawa.

ZNACZENIE POZAROLNICZEJ DZIAŁALNOŚCI GOSPODARCZEJ ROLNIKÓW W PROCESIE MODERNIZACJI GOSPODARSTW ROLNYCH

Streszczenie. Celem artykułu jest identyfikacja oraz ocena stopnia i uwarunkowań zjawiska dofinansowania gospodarstwa rolnego z dochodów uzyskiwanych przez rolników z prowadzonej przez nich pozarolniczej działalności gospodarczej. Materiał empiryczny artykułu stanowią wyniki badań ankietowych przeprowadzonych w latach 2011–2012, tj. wywiad z kwestionariuszem wśród 210 rolników, czyli właścicieli indywidualnych gospodarstw rolnych prowadzących dodatkowo pozarolniczą działalność gospodarczą,

z terenu południowo-wschodniej Polski, tj. z trzech województw: świętokrzyskiego, małopolskiego i podkarpackiego. Analiza wyników badań wykazała, że ważne z punktu widzenia rolników procesy związane z prowadzeniem gospodarstwa rolnego są wspierane finansowo z dochodów uzyskiwanych przez nich z pozarolniczej działalności gospodarczej, o czym świadczą statystycznie istotne i dodatnie parametry regresji logistycznej przedstawionych w artykule modeli w prawie wszystkich analizowanych przypadkach.

Słowa kluczowe: pozarolnicza działalność gospodarcza rolników, dofinansowanie gospodarstwa rolnego, regresja logistyczna

Accepted for print: 25.11.2015

For citation: Ostromęcki A., Zając D., Mantaj A. (2015). The importance of non-agricultural economic activity of farmers in the modernization process of farms. Acta Sci. Pol., Oeconomia, 14 (4), 83–92.

ACTA SCIENTIARUM POLONORUM
ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl
Oeconomia 14 (4) 2015, 93–102

THE IMPORTANCE OF TRANSPORT SYSTEM DEVELOPMENT IN CYPRUS

Maria Parlińska, Maryna Panchenko
Warsaw University of Life Sciences – SGGW

Abstract. The purpose of this study is to investigate and assess the economic conditions and policy priorities for Cyprus transport policy. The main aspects of transportation in Cyprus and the relative position of the region as compared to a benchmark (EU countries) are discussed. The main aim is to give a more detailed indication of the strengths and weaknesses of the transport system in the country and to address areas for future intervention. Where relevant this accompanied by recommendations with respect to the overall transport policy of the country.

Key words: transport policy, motorways, maritime transport, air transport

INTRODUCTION

The goal of the study is to describe the current transport situation and policy in Cyprus. After a brief introduction on the geographical and economic characteristics of the country, it is described the situation of transport in comparison to other European countries. The analysis of the current situation is summarized in a SWOT analyze on the main strengths and weaknesses, opportunities and threats. The assessment of the transport system is followed by an analysis of the key transport policy issues in Cyprus. All comparative numerical data was taken from European statistical web-site.

DISCUSSION

The economy of Cyprus is classified by the World Bank as a high-income economy and was included by the International Monetary Fund in its list of advanced economies in 2001 [World Bank 2011]. The reasonable question to ask is how a small open economy

Corresponding author: Maria Parlińska, Warsaw University of Life Sciences – SGGW, Faculty of Economic Sciences, Nowoursynowska 166, 02-787 Warszawa, Poland,
e-mail: maria_parlinska@sggw.pl

– poor in natural resources – managed to grow so fast and rebound from the catastrophe brought about by the Turkish invasion of 1974. In fact, the growth can be explained by the proper utilization of the country's available resources and comparative advantages, such as the "sun and sea" concept, which supported the growth of tourism, and its geographic location, which enabled the island to establish itself as a regional financial center. On the other hand, colonialism also left a legacy of a relatively good infrastructure, a satisfactory institutional framework and skilled human resources, all of which constituted the necessary initial conditions for subsequent economic growth. The existence of initial conditions plays a decisive role in a country's growth process. However, none of these would have been possible without the rational use of human capital.

Before its independence in 1960, the Cyprus economy was primarily based on agriculture and export minerals. It is the most easterly agricultural land in Mediterranean – for citrus plantings along the sea, grapes and olives as well cereals on the flat expanses of the plain. Cyprus has achieved substantial growth. Despite the political problems and the continuing occupation of the northern part of the island (approximately 37% of the country's territory), some periods showed very high rates of development (e.g. 35% in 1976–1977) and its economy got quickly adapted to the new global circumstances [Central Bank of Cyprus 2012]. Despite the 1974 events, the economy of Cyprus flourishes and before crisis in 2013 it was considered as one of the strongest economies in Europe.

Transport, which is vital to both the economic and social well-being of a country, experienced a parallel growth over the last 20 years. Transport in Cyprus constitutes an infrastructure sector covering a wide spectrum of different activities such as road, air and sea transport and services allied to transport, mainly provided by travel agencies and shipping offices. The contribution of the transport sector to gross domestic product (GDP) in Cyprus fluctuates at around 9%. The sector plays a significant role in development, particularly in tourism and the export of goods and other services. Tourism is one of the main economic-branches in Cyprus (in 2012 revenues from tourism represented 15.5% of the GDP. About 2.4 million tourists visit Cyprus each year (www.cyprus.gov.cy).

The domestically operating passenger transport sector in Cyprus is characterized by a majority of small and medium sized companies. In 2003 there were 1,870 buses and coaches operating in domestic passenger transport, the majority of which were comparatively old vehicles. Use of public transport has decreased from 14 million bus passengers per annum in 1980 to 3.5 million in 2002. This steady decline in the use of public transport may be caused by the rapid increase in car ownership, coupled with the poor service offered by the bus companies and the poor condition of the buses. The share of buses and coaches in passenger transport in Cyprus was about 2% of passenger-kilometers (2002). In order to shift passenger traffic from private cars to public transport, the Ministry of Communications and Works gives now (cyprus.gov.com.cy) particular emphasis to encouraging the use of intercity and rural-buses, and taxi's by:

- upgrading and modernizing the bus and taxi flee;
- encouragement of merging and expansion of the private bus companies;
- planning new bus stations at the outskirts of the urban areas;
- adoption of integrated ticketing.

The Government increased the share of public transport for its population from 2 to 10% in 2015 (cyprus.gov.com.cy).

The road network of Cyprus comprises about 12,118 km of roads of which 257 km motorways. About 2,178 km national and more than 8,973 km of paved and unpaved roads constitute the primary road network within Cyprus and link the towns and villages. Four lane motorways connect the capital Nicosia with the main coastal cities [Central Bank of Cyprus 2012]. During the decade 1990–2013 there has been increased in the total length of motorways in Cyprus from 120 to 257 km. The growth of motorways in Cyprus was the result of first 10 years (1990–2000) development, the next 10 years could be defined as "continuous sleeping": no investments, no projects fully implemented, no workings successfully finalized. The conditions of the road remained the same with small improvements.

RESULTS

Economic history and regional development of Cyprus are unique and cannot be compared with other developed countries as the territory's area, population and generally, usage of roads differ. Therefore, as an example of increasing length of motorways was taken the developing countries and one well-developed country with the smallest total area.

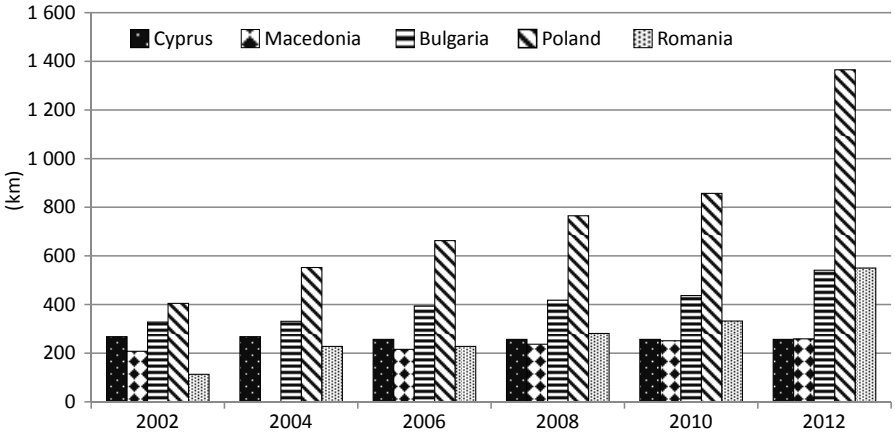

Fig. 1. Total length of motorways in selected years by country

Source: Eurostat, prepared by authors.

Poland is the largest country among the shown in Figure 1 (312,685 km^2) therefore the length of motorways is shown as the highest. On another hand, Luxembourg is the smallest country (2,586 km^2) with the lowest length of motorways. Comparison cannot be fair if only this data is considered. It is more reasonable to show the ratio of motorways as per total area of the country (Fig. 2).

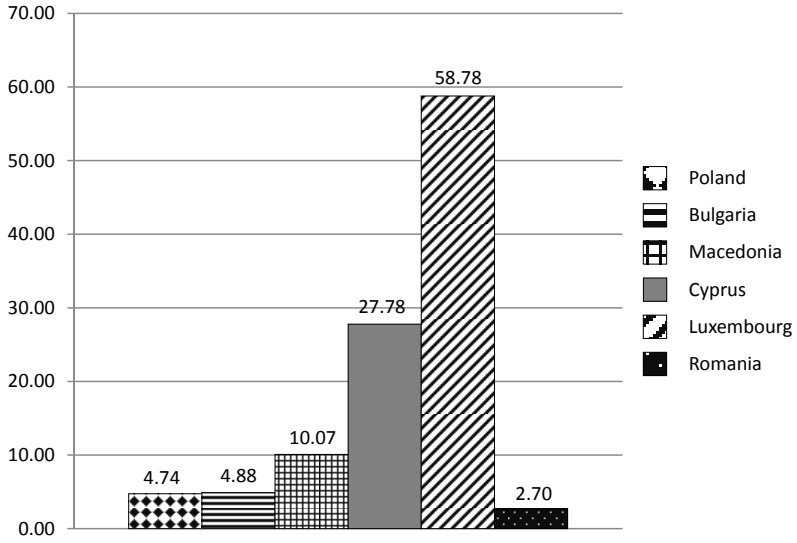

Fig. 2. Ratio of motorways as per total area of the country in selected countries
Source: Eurostat, prepared by authors.

Such ratio helps to investigate the positions of the country in road development. One of the smallest countries showed the highest ratio (58.78 km) of motorway length as per total area. As the result, Luxembourg has an effective road policy and more than 50% of its territory is covered by motorways. Cyprus has highways about on 30% of its territory. Such indicator is quite high for an island, taking into consideration that Cyprus received a relatively small amount of financial support for the development of roads than others members of the European Union, for example Italy. Italy built all its motorways due to investments by European Union funds. In fact, even the less developed region in Italy as Sicily has a highest length of motorways (Fig. 3).

Despite the limited extension that should virtually facilitate the access to terminal transports, the condition of the secondary roads network is not fully satisfactory and Cyprus can be classified as a problematic region in terms of connectivity. In road transportations, there is a lack of a satisfactory level of services in agricultural areas. Domestic goods are transported by road transport, since there is no railway or inland waterway infrastructure. The domestic road freight transport is about 43 million of tones, mostly crude and manufactured minerals. In international transport of goods about 15 millions of tones were transported by Cypriot vehicles. The main goods imported, exported and transported by road are fruits, vegetables and foodstuff.

The key feature of road transportation is the declining trend and the low level of services of public passenger transport in Cyprus, mainly due to the wide use of private transport means. Moreover, in major towns a large traffic congestion is observed, as well as high levels of pollution during rush hours. The lack of appropriate spaces, in combination with the high cost of land in urban centers, set serious limitations in improving or expanding the urban road networks.

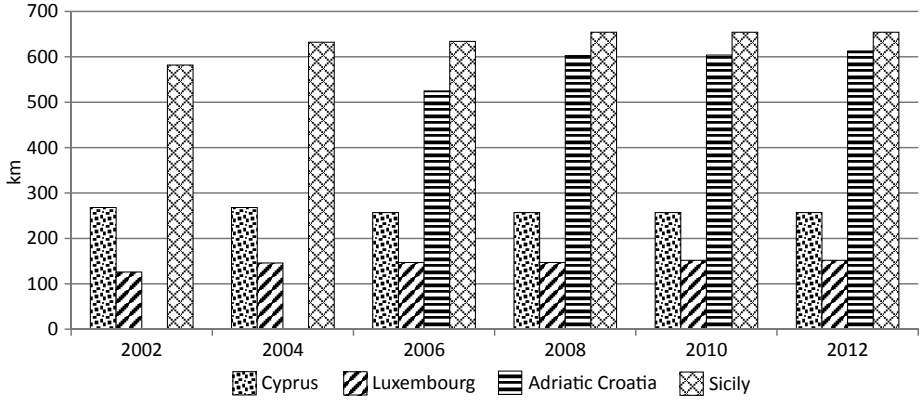

Fig. 3. Motorways network in regions in selected years

Source: Eurostat, prepared by authors.

Road safety is ranked among the highest priorities of the Government. The Ministry of Communications and Works has recently launched a 6-year Strategic Action Plan for Road Safety. The Cyprus Strategic Action Plan addresses to all three major road accident factors, i.e.: the human factor, the vehicles and the road environment (Fig. 4).

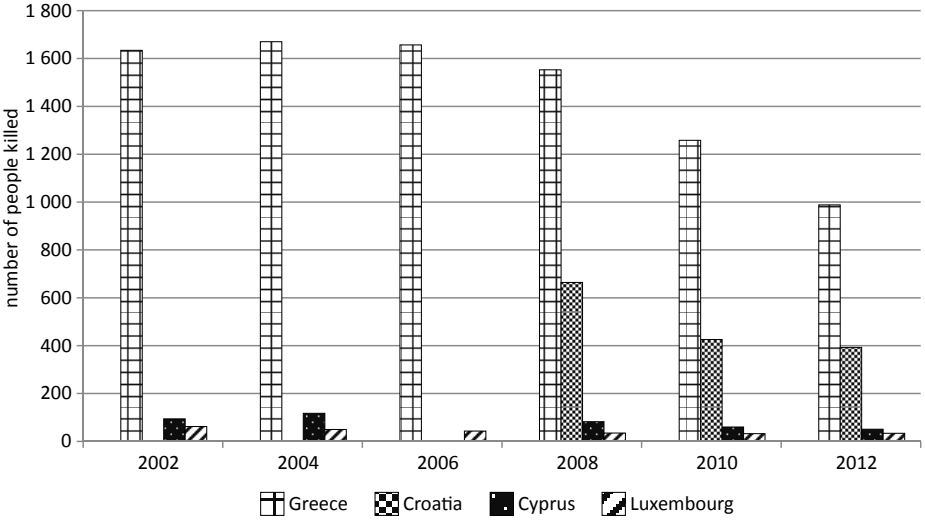

Fig. 4. Road accidents in selected years by countries

Source: Eurostat, prepared by authors.

The seaports (and airports) are important for the economy of Cyprus. Due to its excellent strategic location, it is very important for the country to maintain and improve its maritime links with the rest of the world. Cyprus has six commercial seaports with

Limassol and Larnaca as multipurpose ports and the major gateways for Cyprus to international shipping. Cyprus has also port facilities with the industrial port of Vasiliko and the oil terminals in Larnaka, Dhekelia and Moni (Fig. 5).

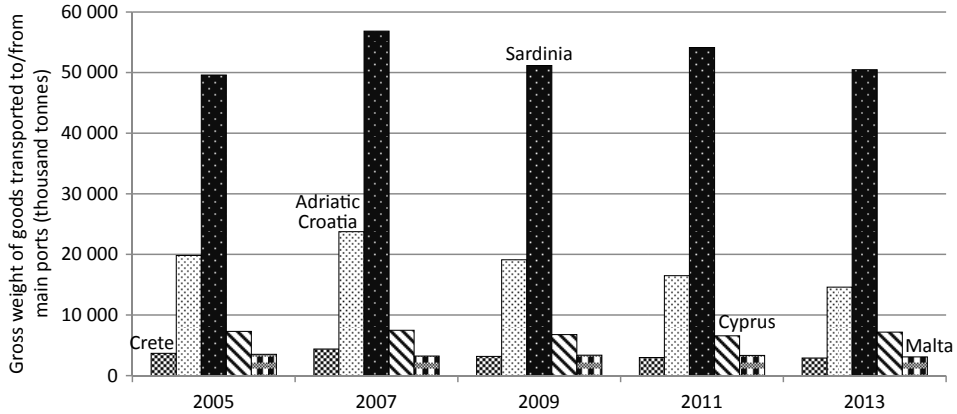

Fig. 5. Maritime transport of freight in regions of selected countries in selected years

Source: Eurostat, prepared by authors.

The Cyprus Ports Authority (CPA) is a semi-governmental organization and is the operator and regulator of the ports in Cyprus and owner of the multipurpose ports of Limassol and Larnaca. From being conventional handlers of the country's seaborne trade and passenger traffic exclusively, Cypriot ports became important cargo transshipment and cruise liner hubs. Limassol is one of the container ports in the Mediterranean Sea. Cyprus has one of the biggest merchant fleets within the EU. Most of the merchant ships flying under Cypriot flag (1,180) belonged to foreign owners (1,149) in 2004. Cyprus ports handle imported and exported cargo to and from the island, the transshipment of container traffic and passenger traffic, either as a port of call within a Mediterranean cruise or as a specialist "mini-cruise" for tourists visiting Cyprus. Concerning harbor infrastructures, the key ports are Lemesos and Larnaka, which play an important role in trade and especially in transit services. In recent years a significant effort has been made, mainly from the Cyprus Ports Authority, to upgrade and expand the harbor infrastructures, especially in the port of Lemesos. The main objective of the Cyprus Government is the development of Limassol port as a safe and efficient place for transporting goods (containers) and passengers within the framework of inter-European transport networks and the development of Larnaca port mainly for passengers. Port upgrading or transformation (in the case of Larnaca) is financed from private funds. Also the promotion of Cyprus as a base for international shipping activities is a main objective in shipping policy. Cyprus is well located to perform competitively against other regional ports as a container hub in the Eastern Mediterranean [CSIL 2005]. However, two obstacles require removal before Cyprus can consider competing in the container hub market: the Turkish embargo on vessels visiting Turkish ports with cargos from Cyprus; the labor practices in Cyprus ports, which prevent the promotion of transparent and predictable cargo handling costs, particularly affecting container vessels [Kotowska 2014].

Being an island country, passenger transport by sea is highly important for Cyprus. Passenger transportation by sea accommodates domestic mini cruise lines for tourists visiting Cyprus, as well as international Mediterranean passenger cruise between countries. Limassol is one of Europe's important cruise ports. The total arrivals and departures of passengers at the ports of Cyprus amounted to 509,000 passengers in 2004; a decrease of almost 50% compared to 2000. The port of Limassol handles about 455,000 passengers and the port of Larnaca about 54,000 passengers [Central Bank of Cyprus 2004].

Cyprus is actively participating in the priority project "Motorway of the Sea of South East Europe", connecting the Adriatic Sea to the Ionian Sea and the Eastern Mediterranean. It's the policy of the government to put its emphasis more on road network maintenance and less on new infrastructure projects. The motorway connections to the main seaports and air ports will be improved. The Ministry of Communications and Works is planning a study for design and implementation of intelligent transport system (ITS), to consider possibilities of electronic charging and real time traffic information. In view of the political pressure for a re-unification of the island and free movement of goods and people on the island, the government is considering to link the existing motorways in the northern and southern parts of the island.

For further development of Cyprus the East–West connections should be strengthened, so that the ports can be part of the Mediterranean network. The ports are the gateways for Cyprus to the world and connections should be made. Cyprus has taken part in Trans-European Networks Study of the European Union and has submitted its proposals for port development programs. Other infrastructure projects that are incorporated in the TEN-T network are: Larnaca and Paphos airports, Limassol and Larnaca ports, Limassol-Nicosia motorway, Limassol-Paphos motorway, Limassol-Larnaca motorway and Larnaca-Nicosia motorway [ECORYS 2006].

The growth of air transport in Cyprus is vitally important for the economy of Cyprus, because of its role in the tourism sector. The government plans to expand the terminal capacities of the two airports of Larnaca and Paphos to control the growth in air transport. The Government is in the process of a implementing a new air traffic management system that should contribute to the efficiency of the airport system. In the field of air transport a growth in activity has been observed, a fact that is directly connected with the increases in tourist traffic. The main problems in the infrastructures of these two airports are the insufficient building facilities and the quality of services in the existing facilities. Cyprus has a wide network of air routes connecting Cyprus with Europe, Africa and Asia. It has become a major international transit station, with excellent connections within the entire region. The main international airports in Cyprus are Larnaca and Paphos. Cyprus is one of the most important member states in terms of total passenger air transport. In 2004 a total number of 6.4 million passengers passed the international airports of Cyprus.

The Ministry of Communications and Works gives particular emphasis to encouraging the use of intercity- and rural-buses and taxis, by upgrading and modernizing of bus and taxi fleet and improving connections of the intercity and urban bus routes. These and many other measures should improve the quality of service in passenger transport and encourage a modal shift from cars to public transport.

CONCLUSIONS

Transport is a key element to the socioeconomic development of Cyprus. The main transport policy of the government for the next few years is the upgrading of the main transport infrastructure (airports, ports and roads) so that it will be effectively linked with the Trans-European Networks and the free flow of passenger and goods is safeguarded. Cyprus also started a regional program in 2004, with policy priorities in infrastructure measures for SMEs in the manufacturing and tourism sector (60%), around 20% in transport. In the meantime, transport has been identified as a major contributor to environmental pollution. Road transport, air traffic and the movement of hazardous goods pose great dangers to the environment.

In 2004 the Ministry of Communications and Works adopted some measures for the encouragement of the sustainable use of energy in the transport sector. Some of these measures were: a reduction of the excise duty for small and middle class volume engine vehicles, abolished excise duty and registration fees on electric cars as well dual propulsion cars (hybrids) were subject to half the registration and circulation fee etc.

Summarizing the aforesaid, the current situation of transport in Cyprus is not good enough for well-developed country. It needs a lot of governmental investments from sides as well as an implementation of European projects. The main points can be highlighted with SWOT analyze method.

The main issues in relation to weaknesses of transport system in Cyprus are:

- expansion of cities without a plan has resulted to limited space for road network and pedestrians;
- expansion of cities with low density obliges use of private cars;
- limited funds of local authorities;
- low share of public transport;
- ageing fleet of buses;
- many authorities responsible for road network and public transport;
- no land connection to EU;
- embargo from Turkey.

As threats to Cypriot transport system, the following factors can be mentioned:

- continuous urban sprawling limits available;
- space for the development of transport;
- infrastructures;
- increasing cost for battling accidents and traffic;
- congestion;
- big cost for upgrading public transportation and obtaining increased share in modal split;
- difficulty to change the mentality of the public;
- towards public transport use and road safety;
- development of competing hubs in the region.

Even with lots of weaknesses the Cyprus economy remains vital. The Cyprus economy achieved enviable progress in the 50 years since the country's independence. The traditional agricultural economy of the early 1960s was gradually transformed into an

economy characterized by a high standard of living and a strong transport system with following breakdowns:

- interurban road network mostly completed;
- area traffic management systems are implemented for traffic controlled junctions;
- small distances between cities;
- low costs of projects compared to other countries;
- geographical location appropriate for development of transport hub;
- well organized public administration.

The successful economic performance of Cyprus can be reached with the following opportunities:

- opportunity for funding of transport infrastructure;
- projects from EC funds;
- sensitivity of government and inhabitants to environmental issues and energy saving;
- implementation of intelligent transport system (ITS) to fight congestion and accidents;
- saving funds with appropriate training and reduction of accidents;
- priority for airports and ports.

Implementation of traffic safety actions is also of high priority and the government has presented a strategic plan for road safety in Cyprus. The plan focuses on the road environment, drivers' behavior, cars and incident management. Viable public transport networks should be a priority including networks for cycles and pedestrians in cities. Therefore the improvement of the urban infrastructure and measures to improve the quality of urban transport and services are necessary.

REFERENCES

Central Bank of Cyprus (2003). Annual Report 2002, Nicosia.

Central Bank of Cyprus (2004). Annual Report 2003, Nicosia.

Central Bank of Cyprus (2005). Annual Report 2004, Nicosia.

Central Bank of Cyprus (2012). The Cyprus Economy. Historical reviews. Prospects. Challenges. Nicosia.

CSIL – Centre for Industrial Studies – Milan (2005). Policy guidelines for regions falling under the new regional competitiveness and employment objective for the 2007–2013 period. Vol. II. Country Report. Cyprus.

ECORYS Nederland BV (2006). Study on Strategic Evaluation on Transport Investment Priorities under Structural and Cohesion funds for the Programming Period 2007–2013. Rotterdam.

Eurogroup signs off on bailout agreement reached by Cyprus and troika (on-line daily journal). Ekathimerini from 25.03.2013. Available at www.ekathimerini.com.

European Commission (2005). Trans-European Transport Networks. TEN-T Priority Axes and Projects 2005. Luxembourg: Office for Official Publications of the European Communities.

European Commission's report SWD (2015). 32 final. Commission Staff Working Document Country Report Cyprus 2015. Brussels.

European Union (2004). Decision No 884/2004/EC of the European Parliament and of the Council of 29 April 2004 amending Decision No 1692/EC on Community guidelines for the development of the trans-European transport network. Official Journal of the European Union L 201 (Corrigendum to L 167).
Kotowska, Z. (2014). The Competitiveness of Feeder Shipping Compared to Road Transport Journal of Maritime Research, XI, III, 21–26.
World Bank (2011). Country and Lending Groups. Retrieved from data.worldbank.org/about/country-and-lending-groups (accessed 02.08.2011).

ZNACZENIE ROZWOJU SYSTEMU TRANSPORTOWEGO NA CYPRZE

Streszczenie. Celem niniejszego opracowania jest zbadanie oraz ocena warunków ekonomicznych i priorytetów politycznych polityki transportowej Cypru. Omawiane są główne aspekty transportu na Cyprze i pozycja regionu w porównaniu do innych krajów UE. Wskazano silne i słabe strony systemu transportowego w kraju i wyszczególniono zasady dla przyszłych interwencji. Podano zalecenia w odniesieniu do ogólnej polityki transportowej kraju.

Słowa kluczowe: polityka transportowa, autostrady, transport morski, transport lotniczy

Accepted for print: 23.11.2015

For citation: Parlińska M., Panchenko M. (2015). The importance of transport system development in Cyprus. Acta Sci. Pol., Oeconomia, 14 (4), 93–102.

ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

ACTA SCIENTIARUM POLONORUM *Oeconomia 14 (4) 2015, 103–113*

DEBT OF COMMUNES IN THE LIGHT OF A NEW INDIVIDUAL DEBT RATIO

Łukasz Satoła
University of Agriculture in Krakow

Abstract. The article presents the impact of a new individual debt ratio on the communes' possibilities to incur obligations. It presents also a classification of restrictions used to limit self-government debt in the selected member states of the European Union. Changes caused by a new Act on public finance in the field of debt in the self-government sector were presented. All self-government units at the level of communes in Poland (2,479 entities) were analyzed. It was indicated that the financial position of communes is a key factor determining their possibilities to incur debt. Along with deterioration in the financial position, the number of communes showing the operating surplus was decreasing, which resulted in reduction in individual debt ratios. Upon introducing statutory amendments, the communes, when planning budgets, began to introduce corrective actions which were supposed to lead to increase the potential of incurring credit obligations.

Key words: budget, self-government debt, public finance, individual debt ratio (IDR), debt of communes

INTRODUCTION

Self-government units execute many public tasks that are assigned to them in relevant legal acts or taken over on the basis of an agreement with other public administration units [Milewska and Jóźwik 2014]. Both the execution of tasks aimed at regular functioning of a unit and taking of actions aimed at its development in the long run imply the necessity to incur expenses. Insufficient funds to cover the operating costs are most often indicated in the subject literature cause of self-governments using refundable funds both in Poland and in other states [Baran et al. 1998, Gonet 2006]. Reforms conducted in Poland, consisting in delegating an increasing number of tasks from the central level to

Corresponding author: Łukasz Satoła, University of Agriculture in Krakow, Institute of Economics and Business Management, Department of Economics and Corporate Finance, Mickiewicza 21, 31-120 Kraków, Poland, e-mail: lsatola@ar.krakow.pl

local governments, took place in most cases without ensuring an adequate level of financing [Gilowska and Misiąg 2000, Kopańska and Witkowski 2003, Zawora 2015]. It forced self-government units to incur debt to ensure the execution of tasks delegated by way of decentralization of public tasks at an appropriate level.

In accordance with the provisions of a new act on public finance, all self-government units were obliged to prepare budgets in a way that current expenses could not exceed their current income [Act on public finance 2009]. This situation means lack of possibility of the presence of deficit in the so-called current budget.

Statutory restrictions were supposed to reduce the scale of debt of self-governments, which was particularly important under the conditions of the crisis in public finance and danger to exceed the so-called second cautionary threshold (state public debt to GDP ratio). One of the actions aimed at reaching this goal was introduction of changes in limiting debt of self-governments. Instead of a general quantitative formula, individual debt ratio (IDR) was introduced, calculated for every unit separately and taking into account its financial position.

The purpose of the paper is an attempt to indicate how a new individual debt ratio influenced the communes' possibilities to use refundable sources of financing.

MATERIAL AND METHODS

The source of financial data for the conducted analyses were budget statements prepared by particular self-government units, for the purpose of assessment of their financial position by the Ministry of Finance, and data of the Local Data Bank of the Central Statistical Office (BDL GUS). The analysis covered data from budgets of 1,569 rural communes, 603 urban-rural communes and 307 urban communes. Among budget categories, the analysis covered such values as total income and current income, current expenses, sale of assets and debt service costs.

The time range of the conducted analyses covers the years 2007–2013, and it applies to an analysis of particular parameters determining the possibility to incur debt according to new principles, on the other hand, due to the ratio formula structure, the values of the ratio itself were calculated and presented for the period 2010–2014.

To calculate individual debt ratios for different communes, the following formula was used:

$$\left(\frac{R+O}{D}\right) \leq \frac{1}{3} \cdot \left(\frac{D_{b_{n-1}} + S_{m_{n-1}} - W_{b_{n-1}}}{D_{n-1}} + \frac{D_{b_{n-2}} + S_{m_{n-2}} - W_{b_{n-2}}}{D_{n-2}} + \frac{D_{b_{n-3}} + S_{m_{n-3}} - W_{b_{n-3}}}{D_{n-3}} \right)$$

where: R – planned for the budget year total amount under repayment of instalments of credits and loans and buy-out of issued securities;
O – planned for the budget year interest on credits and loans, interest and discount from issued securities and repayments of amounts resulting from granted sureties and guarantees;

D – total income in a given budget year;
D_b – current income;
S_m – income from sale of assets;
W_b – current expenses;
n – budget year for which the relation is fixed.

The assessment of particular elements comprising the possibilities to incur debt by local governments was made using budget ratios. For the purpose of analyses, mainly classic statistical measures (dispersion and variability) and grouping of objects were used. The results of the conducted calculations were presented in the tabular form.

RESULTS AND DISCUSSION

Access of self-government units to capital market, including the possibility of incurring loans and credits, is one of rights granted to local governments guaranteed in the European Charter of Self-Government [1994]. This privilege is supposed to support financial self-reliance of self-government, on the other hand, it should not be treated as a justification for incurring debt in any situation. Incurring debt is most often a competent and justified action in the event of conducting investment activities whose positive effects appear usually no sooner than after some time. A phenomenon improper from the point of view of local financial policy is, on the other hand, incurring debt for financing current needs which, in extreme cases, can lead to accumulation of the so-called debt loop and solvency problems [Dafflon 2002, Swianiewicz 2011].

Limiting debt of self-governments is used in many countries of Europe, however, there are no uniform solutions in this respect (Table 1). The purpose of limiting the possibilities to incur obligations by self-government units are legal, economic and organizational restrictions.

In Poland, statutory restrictions in self-governments' possibilities to incur debt in the public finance system were in place already in the period before the financial crisis. However, as a result of events on financial markets and their adverse effect on economy in the macroeconomic scale (slowdown in growth of GDP rate, recession, increase in the unemployment level, increase in the level of budget deficits, etc.), these regulations were amended, and as a result the self-government subsector began to function under changed financial conditions. The first amendment, binding from 2011, was the need to balance current budgets, which means that current expenses cannot exceed obtained current income. This assumption, which is rational and inhibits incurring debt for financing of current expenses, is applied also in many countries [Bitner 2013]. A certain exception from the rigorous application of this rule is to include, when fixing the limit of expenses, the amount of the so-called free funds from the previous year. This enables slightly more flexible approach to management of self-governments' budgets, which is positively stressed also in international experiences [Ashworth et al. 2005].

Another important limitation regarding the financial policy of self-government units was the introduction of individual debt ratio (IDR). The intention of introducing IDR was to consider diverse possibilities of repaying obligations incurred by particu-

Table 1. Limiting debt of self-government units in the European Union

Scope of applied restrictions	Solutions applied in EU member-states
Goal of debt	both current and investment goals: Czech Republic, Hungary, Finland (the necessity of balance in three-year planning period)
	only investment goals: Austria, Belgium, Denmark, Estonia, France, Spain, Netherlands, Ireland, Luxembourg, Germany, Slovakia, Sweden, UK, Italy
Consent to incurring credit or loan	required: Austria, Cyprus, Denmark, Spain, Ireland, Latvia, Malta, Germany, Slovenia
	not required: Czech Republic, Estonia, Hungary
Upper annual debt limit	35% of the annual income – Lithuania 40% of the annual income for long-term liabilities and 20% of the annual income – short-term liabilities – Cyprus 60% of the annual income – Estonia 60% of the annual current income in the previous budget year – Slovakia
	self-governments must comply with the individual upper debt limit determined on the annual basis by the supervisory authorities – UK The central authorities determine maximum debt limits corresponding to maximum percentage of annual income, budget expenses or general investments – Denmark Diverse, depending on land – Austria
Upper limit of annual debt service costs	5% of income in the previous budget year – Slovenia 12.5% of annual financial transfers in the current year or 10% of capital outlays in the previous year – Portugal 20% of the annual income – Estonia 25% of income in the previous budget year – Slovakia 25% of operating income – Spain 70% of current income – Hungary

Source: Prepared on the basis of Poniatowicz [2006] and Wiewióra [2009].

lar self-governments. It applies among others to increasing adequacy between statutory debt limit, and debt service capacity of self-government units [Swianiewicz 2011, Wiśniewski 2011, Galiński 2014]. The previously binding limit of 60% of debt in relation to total budget income for some entities (having considerable income potential – mainly strong urban centres) was a solution inhibiting their development, on the other hand, in extreme cases it enabled units characterized by low financial self-reliance to generate too high, difficult for effective service level of debt. The individual debt ratio introduced in a new Act on public finance was deprived of this defect, and its structure presented the special character of a budget of a given self-government unit.

In the structure of a new individual debt ratio, the possibility of incurring debt by self-government units was linked to generating operating surpluses in their budgets, which means earning higher current income in relation to current expenses.

Obtaining a positive result on operating activities of a self-government is an important aspect of the evaluation of its financial position, as it proves proper management of funds allocated for the fulfilment of current needs of local communities, which, in turn, is the main task of communes.

Changes in budget planning and execution introduced in connection with a new Act on public finance brought about increased pressure on self-governments with regard to generating operating surpluses. It was related both with a possibility of adoption of a correctly designed budget (not questioned by the Regional Financial Chamber), but also with shaping potential to incur obligations. Binding, starting from 2011, balancing of current budgets resulted in a clear growth in the number of communes with operating surplus (Table 2). A trend observed from 2008, concerning a decreasing number of communes whose current part of budgets were characterized by surplus was reversed in that year. It was not related with improvement in their financial position, but with the adaptation to new restrictions resulting from the amendment of the provisions of the Act on public finance [see Satoła 2015]. In the following years, a constant trend of increasing number of communes characterized by operating surplus could be noticed. It is worth emphasizing that the number of entities characterized by operating surplus in current budgets was increasing in any group of communes (rural, urban-rural and urban). During the last analysed year (2013), the number of communes characterized by operating surplus was greater than in each of previous years, including even greater than in the best from the point of view of economic situation 2007. This shows that self-governments adjusted respective budget items to new legal circumstances in which they were functioning.

Table 2. The number of communes with operating surplus in the years 2007–2013

Specification	2007	2008	2009	2010	2011	2012	2013
Communes total	2 415	2 420	2 302	2 066	2 309	2 392	2 450
Rural communes	1 536	1 541	1 498	1 362	1 469	1 533	1 557
Urban-rural communes	591	590	555	478	564	578	594
Urban communes	288	289	249	226	276	281	299

Source: Prepared by the author on the basis of BDL GUS.

The next budget item which was analysed was operating deficit as a negative difference between current income and current expenses. The presence of operating deficit informs about the presence of difficulties in financing current tasks, which, according to up-to-date legislative solutions, almost eliminates the possibilities to incur new obligations.

The accumulated value of operating deficit was increasing from 2007 to 2010 and dropped in the following years (Table 3). The greatest pace of growth was recorded in the years 2009–2010, which may be an effect of economic slowdown, and, as a consequence, restricting income potential of self-governments (mostly taxes and charges). From 2011, in connection with the effective date of the amended provisions of the Act on public finance concerning the need to separate current part and assets in self-government budgets, step limitation in operating deficit was recorded. Also the analysis of dynamics of other

Table 3. List of selected statistical characteristics describing operating deficit in budgets of the communes in the period 2007–2013 (PLN)

Specification	2007	2008	2009	2010	2011	2012	2013
Total amount	39 366.84	57 333.06	242 686.22	473 652.25	102 280.75	49 474.64	27 193.11
Arithmetic mean	615.11	971.75	1 371.11	1 146.86	601.65	568.67	937.69
Greatest value	5 996.02	11 334.82	24 629.24	25 463.24	6 621.39	3 818.05	5 254.88
Median	325.96	543.05	478.80	494.59	274.12	318.47	388.02

Source: Calculated by the author on the basis of data of BDL GUS.

statistical measures confirms the above described regularities. However, at this point it is worth emphasizing values of median and arithmetic mean of operating deficit growing at the end of the analysed period. This arrangement of statistical characteristics proves that the decreasing number of communes whose budgets were unbalanced in the current part was accompanied by presence of shrinking group of units with a relatively high lack of balance between current income and current expenses. This problem affected mostly cities with the rights of a district (in 2013 e.g. Świętochłowice – 5.25 million PLN, Piła – 4.18 million PLN, Bytom – 3.24 million PLN).

Financial result in the current budget is a basic element determining the possibility to incur debt by self-governments, in accordance with the introduced formula of fixing individual debt ratio (IDR). Another parameter that may affect potential to incur obligations are incomes from sale of assets. As it has been indicated, however, by the practice of functioning of self-governments, this kind of income is not a significant participation in the budget and actions of communes in the long run cannot be based on it. According to the formula set out in the Act on public finance IDR calculations were made for all self-government entities in Poland.

The calculated average values of individual debt ratio for all communes in Poland indicate reduction in their ability to incur obligations. At this point, it is worth emphasizing that limiting debt of local government units according to IDR has been effective in Poland since 2014, and nevertheless the conducted analyses gave the basis for claiming that if this ratio was effective before (e.g. 2010), the communes would have a greater possibility to incur debt (Table 4). This state of affairs could be explained by a better financial position of communes in the years 2007–2009, and thus the period (three years) from which data are used in order to calculate IDR for 2010. In subsequent years, the financial position of communes was deteriorated, which affected the debt incurrence possibility ratio. The lowest level of IDR was achieved in 2013, and thus when the parameters for its calculating were from the period 2010–2012, namely the period of worse situation in the economy and self-government finances [Zawora 2015]. The values calculated for 2014 are higher than in the years 2012–2013, which may be interpreted as authorities of communes undertaking real actions aimed to adapt to a new reality and such budget planning to allow also using external refundable sources of financing.

In the analysed period the diversity between the assessed self-government units was limited. The lowest values of the ratio clearly increased and maximum values definitely

Table 4. List of selected statistical characteristics for total individual debt ratio of communes in the years 2010–2014 (%)

Specification	2010	2011	2012	2013	2014
Arithmetic mean	11.539	9.708	7.786	7.134	8.022
Smallest value	–13.992	–15.988	–15.866	–10.790	–6.231
Greatest value	57.326	54.288	66.307	37.794	32.466
Median	11.102	9.298	7.266	6.743	7.558
Standard deviation	6.212	6.289	5.891	4.305	3.786
Volatility coefficient	0.538	0.648	0.757	0.603	0.472
1st quartile	7.489	5.674	4.039	4.228	5.542
3rd quartile	15.003	13.185	10.962	9.528	10.001

Source: Calculated by the author.

decreased, implying in consequence reduction in differences between the analysed entities. In order to conduct in-depth analysis of the analysed community detailed calculations of individual debt ratios for particular types of communes were conducted.

The trends observed in the population of urban communes (Table 5) were close to the described earlier for the whole community, nevertheless it is worth paying attention to slightly lower values of arithmetic mean in the final years of the analysis. Urban communes, on average, conducted in the years before investment activities on a slightly wider scale, often using external financing, which now makes it necessary to serve debt and sustain increased expenses for repayment of instalments and interest on credits or on buy-out of issued bonds. At this point, however, it is worth also noticing large internal diversity in this group. Higher values of IDR were typical of large, economically prosperous cities (often seats of present provinces, constituting regional centres of growth), on the other hand, lower values were recorded in cities grappling with economic problems, resulting from their peripheral location, demographic recourse or anachronistic structure of the local economy.

Table 5. List of selected statistical characteristics for individual debt ratio of urban communes in the years 2010–2014 (%)

Specification	2010	2011	2012	2013	2014
Arithmetic mean	11.697	9.794	7.887	6.476	6.584
Smallest value	–9.145	–15.041	–15.866	–9.504	–0.778
Greatest value	38.021	30.443	29.771	29.150	24.981
Median	11.745	9.924	7.620	6.062	6.128
Standard deviation	6.205	6.186	5.719	4.062	3.347
Volatility coefficient	0.530	0.632	0.725	0.627	0.508
1st quartile	8.226	6.081	4.284	3.930	4.270
3rd quartile	15.127	13.073	11.008	8.577	8.563

Source: Calculated by the author.

The average individual debt ratio calculated for a group of urban and rural communes at the beginning of the analysis was running on the highest level among all types of units (12.168%). In a later period, however, it dropped quite dynamically and achieved 7.537% in the last year of the analysis (Table 6).

Table 6. List of selected statistical characteristics for the individual debt ratio of urban and rural communes in the years 2010–2014 (%)

Specification	2010	2011	2012	2013	2014
Arithmetic mean	12.168	10.198	8.139	7.063	7.537
Smallest value	–3.986	–7.368	–11.362	–10.790	–6.231
Greatest value	38.006	32.270	31.899	32.973	22.566
Median	11.709	9.926	7.744	6.806	7.138
Standard deviation	6.441	6.115	5.760	4.254	3.523
Volatility coefficient	0.529	0.600	0.708	0.602	0.467
1st quartile	8.060	6.186	4.414	4.069	5.310
3rd quartile	11.709	9.926	7.744	6.806	7.138

Source: Calculated by the author.

The statistical data included in Table 6 do not reflect fully variability present in this group of communes. The analysis for the whole group indicates quite a large diversity of units (standard deviation, variability coefficient), nevertheless a more deepened assessment conducts to other conclusions. It turned out that other measure of dispersion, namely interquartile range, was at the lowest level throughout the analytical period. It should be interpreted as the presence of relatively smallest variability in this group of entities in the area of typical units. Owing to relatively large diversity in the whole group of urban and rural self-governments the greatest responsibility was attributed to units belonging to two extreme quartile groups.

The situation was completely different in the population of rural communes, among which diversity of objects was the largest (Table 7). It is confirmed only in part by basic statistical measures as standard deviation and variability coefficient. Both differences between the smallest and the largest values (range of characteristics) and interquartile range were running in this group at definitely the highest level. It is worth mentioning that values of interquartile range in each of the analysed years exceeded more than twice those calculated for the analysed before group of units with urban-rural status. This large diversity is, first of all, result of the most numerous groups of entities, and – which is most important – effect of a very large diversity of economic potential, and, as a consequence, also financial population of rural communes in Poland.

The trend of changes in the value of IDR in the group of rural communes was very similar to those presented and characterized before in other types of entities. The highest values were calculated for 2010 and later they were gradually decreasing until 2013, and grew in the subsequent year to 8.49%. Such results prove that during the recent two years of the analysis, self-governments of rural communes were characterized by a higher possibility to incur debt than entities with the urban and rural status. A more detailed analysis of the ratio value distribution indicates that it is right skewed, which means that calcu-

Table 7. List of selected statistical characteristics for the individual debt ratio of rural communes in the years 2010–2014 (%)

Specification	2010	2011	2012	2013	2014
Arithmetic mean	11.267	9.503	7.631	7.290	8.490
Smallest value	–13.992	–15.988	–12.343	–7.967	–4.461
Greatest value	57.326	54.288	66.307	37.794	32.466
Median	10.793	8.918	7.016	6.865	8.052
Standard deviation	6.108	6.368	5.971	4.360	3.871
Volatility coefficient	0.542	0.670	0.783	0.598	0.456
1st quartile	7.286	5.352	3.703	4.403	5.960
3rd quartile	14.583	12.984	10.728	9.628	10.399

Source: Calculated by the author.

lated for most units individual debt ratio is lower than the average for the whole group. At the same time, there is a relatively less numerous group of rural communes, which are characterized by a very high potential to incur and serve debt. These are entities whose favourable budget situation is a result of the location of valuable natural resources whose operation brings certain benefits. In this group are also included communes situated near big cities or important transport routes which benefit in this way from favourable location. Industrial and service companies have been established on their territory for a long time, creating jobs independently or in cooperating with them entities which contributed to dynamic local economic development. Functions assigned to the functioning of such business entities are functions of creating wealth of territorial units and their inhabitants.

CONCLUSIONS

Introduction of the individual debt ratio was aimed at limitation in dynamically growing debt in the self-government subsector. Possibility to incur subsequent obligations by the communes currently depend on capacity to serve those obligations, namely are mainly determined by obtaining operating surplus. A deficit in the current budget makes it impossible to use new credits and loans. This type of statutory restriction from external funding deserves a positive evaluation, because it counteracts the phenomenon of spiral of debt and accepting credit obligations a given self-government unit is unable to serve. On the other hand, certain critical comments can be presented in relation to the structure of ratio itself. It turns out that it responds with a significant delay to changes in the economic situation, and, as a consequence, financial position of self-government units.

The conducted analyses induce to the following conclusions:

1. The community of Polish communes is characterized by large diversity of possibilities to incur debt obligations justified by their current and past financial position.
2. The financial position of communes was affected largely by the macroeconomic situation and sustained substantial outlays related to starting investment activities (including co-financed from EU funds).

3. Introduction of the individual debt ratio limited the possibilities of self-government units to use refundable sources of financing, although this limitation was selective. The restrictions affected to the greatest extent communes with worse financial position, high share of current expenses and low income potential. It is easier to cope with a new limit for units characterized by significant financial self-reliance and certain and stable sources of own income.
4. The conducted analysis in category groups of communes did not give sufficient grounds to observe which units gain or lose most as a result of amendment of the debt incurrence principles. Each type of entities: rural, urban-rural or urban entities included both such to which the new ratio substantially reduced the possibility to incur obligations and such that, from the moment of its introduction, could make use of credits to a greater extent than before.
5. The values of a new debt ratio are strongly correlated with the past financial position of a self-government unit, which depends to a large extent on the pace of economic development on the macroeconomic scale. The crisis of public finance affected adversely the financial position of self-governments, reducing debt incurrence limits. In a further perspective, this may lead to restriction in development possibilities or at least delay in responding to positive changes in the economic situation.

REFERENCES

Ashworth, J., Geys, B., Heyndels, B. (2005). Government weakness and local public debt development in Flemish municipalities. International Tax and Public Finance, 12 (4), 395–422.

Baran, T., Smardzewski, K., Zawiła-Niedźwiecki, J. (1998). Obligacje komunalne w USA i krajach europejskich. Samorząd Terytorialny, 7–8, 138–147.

Bitner, M. (2013). Reguły fiskalne ograniczające zaciąganie długu przez jednostki samorządu terytorialnego w wybranych krajach OECD – analiza prawno-porównawcza. Samorząd Terytorialny, 1–2, 9–40.

Dafflon, B. (2002). The Theory of subnational balanced budget and debt control. [In:] B. Dafflon (Ed.), Local Public Finance in Europe: Balancing the Budget and Controlling Debt. Studies in Fiscal Federalism and State – Local Finances Series, Cheltenham-Northampton, Edward Elgar, 15–44.

Europejska Karta Samorządu Terytorialnego [European Charter of Self-Government] (Dz.U. 1994 nr 124, poz. 607).

Galiński, P. (2014). Możliwości finansowania inwestycji przez gminy w Polsce w latach 2010––2012. Zeszyty Naukowe Uniwersytetu Szczecińskiego. Finanse, Rynki Finansowe, Ubezpieczenia, 65, 71–82.

Gilowska, Z., Misiąg, W. (2000). Dostosowywanie dochodów jednostek samorządu terytorialnego do norm konstytucyjnych i standardów europejskich. Polska Regionów, 17, Instytut Badań nad Gospodarką Rynkową, Warszawa.

Gonet, W. (2006) Kredyty, pożyczki, obligacje w gospodarce finansowej samorządu terytorialnego. Monografie i Opracowania, 543, Szkoła Główna Handlowa w Warszawie – Oficyna Wydawnicza, Warszawa.

Kopańska, A., Witkowski, K. (2003). Zewnętrzne źródła finansowania inwestycji jednostek samorządu terytorialnego. Difin, Warszawa.

Milewska, A., Jóźwik, M. (2014). Organization and changes of local government finance system in view of implementation of participatory budgeting. Acta Sci. Pol., Oeconomia, 13 (4), 125–134.
Poniatowicz, M. (2006). Limitowanie zadłużenia jednostek samorządu terytorialnego w krajach członkowskich Unii Europejskiej. Zeszyty Naukowe Uniwersytetu Szczecińskiego, Ekonomiczne Problemy Usług, 426, 125–132.
Satoła, Ł. (2015). Kondycja finansowa gmin w warunkach zmiennej koniunktury gospodarczej. Journal of Agribusiness and Rural Development, 1 (35), 115–123.
Swianiewicz, P. (2011). Finanse samorządowe – koncepcje, realizacja, polityki lokalne. Municipium, Warszawa.
Ustawa z dnia 27 sierpnia 2009 r. o finansach publicznych [Act on public finance] (Dz.U. 2009 nr 157, poz. 1240 ze zm.).
Wiewióra, M. (2009). Prawne ograniczenia w zaciąganiu kredytów i pożyczek przez jednostki samorządu terytorialnego w Polsce na tle rozwiązań stosowanych w wybranych krajach europejskich. Materiały i Studia NBP, 239, 1–48.
Wiśniewski, M. (2011). Ocena zdolności kredytowej gmin. Difin, Warszawa.
Zawora, J. (2015). Uwarunkowania wykorzystania funduszy Unii Europejskiej wynikające z sytuacji finansowej jednostek samorządu terytorialnego. Finanse Komunalne, 1–2, 43–54.

ZADŁUŻENIE GMIN W ŚWIETLE NOWEGO INDYWIDUALNEGO WSKAŹNIKA ZADŁUŻENIA

Streszczenie. W artykule przedstawiono wpływ nowego indywidualnego wskaźnika zadłużenia na możliwości zaciągania zobowiązań przez gminy. Przedstawiona została także klasyfikacja ograniczeń stosowanych w limitowaniu samorządowego długu w wybranych państwach Unii Europejskiej. Wskazano zmiany, jakie w obszarze zadłużania się wywołała w sektorze samorządowym nowa ustawa o finansach publicznych. Analizie poddano wszystkie jednostki samorządu terytorialnego szczebla gminnego w Polsce (2479 podmiotów). Wskazano, że kondycja finansowa gmin jest kluczowym czynnikiem określającym ich możliwości do zaciągania długu. W miarę pogarszania się sytuacji finansowej malała liczba gmin wykazujących nadwyżkę operacyjną, co skutkowało spadkiem indywidualnych wskaźników zadłużenia. Z chwilą wprowadzenia nowelizacji ustawowych gminy, planując budżety, zaczęły wprowadzać działania korygujące, które w efekcie miały doprowadzić do zwiększenia potencjału zaciągania zobowiązań kredytowych.

Słowa kluczowe: budżet, dług samorządowy, finanse publiczne, indywidualny wskaźnik zadłużenia (IWZ), zadłużenie gmin

Accepted for print: 30.10.2015

For citation: Satoła Ł. (2015). Debt of communes in the light of a new individual debt ratio. Acta Sci. Pol., Oeconomia, 14 (4), 103–113.

ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

ACTA SCIENTIARUM POLONORUM *Oeconomia 14 (4) 2015, 115–125*

GENDER AND SUSTAINABILITY IN THE ECONOMIC DEVELOPMENT – EQUAL CHANCES FOR WOMEN AT THE LABOUR MARKET

Janina Sawicka, Joanna Łagoda
Warsaw University of Life Sciences – SGGW

Abstract. The article contains basic concepts of equal opportunity policy and gender issues. The economic dimension of equality policies were disused and evaluated. Assessment was done of the situation of women at national and European labour market. The reasons for lower participation and employment of women as well as their discrimination on the labour market were discussed. Statistical studies confirm that both in Poland and in European Union countries there are important differences in wages. Comparison of such measures as GII, GEI and GPG shows a clear division between groups of countries: the developed ones (mainly Scandinavian) where differences by gender are not present or are minor, group of countries from the Mediterranean basin, where situation of women is more sensitive to the influence of stereotypes and traditional patterns, and a less developed countries from Central and Eastern Europe, where women still do not have equal opportunities in the labour market.

Key words: equal chances policy, labour market, gender pay gap, European Union, Poland

INTRODUCTION

Equality is an essential characteristic and indicator of democracy, which is why the goal of many modern societies is the desire to respect the principle of equal opportunities because undoubtedly translates into the quality of social, political and economic life of citizens, thus ensuring a more sustainable and balanced socio-economic development. In view of the fact that in every society groups are present in a particularly vulnerable to the unequal treatment which reduces the chances of improving the quality and conditions of life and welfare of the public, there is a more or less conscious need to undertake meas-

Corresponding author: Janina Sawicka, Warsaw University of Life Sciences – SGGW, Faculty of Economic Sciences, Department of European Policy, Public Finance and Marketing, Nowoursynowska 166, 02-787 Warszawa, Poland, e-mail: janina_sawicka@sggw.pl

ures aimed at balancing opportunities for people exposed to discrimination for any reason. Objectives, instruments, actions and measures aim of doing so are referred to the notion of equality policy, having central importance for sustainable development at all levels of the economy and society. Discrimination can occur both on grounds of gender, age, race, nationality, disability, religion, sexual orientation, etc. Many places in the discussions as well as activities engaged themes of gender, which leads to perverse misunderstandings and ideological disputes, which we have seen in Poland, unheard of in other countries, scale. The article attempts to address these disputes but focusing mainly on the comparison and the description of objective scientific facts mainly using the Central Statistical Office and Eurostat statistics and reports from Polish and foreign scientific research. This made it possible to confirm that the situation of women in the labour market is more difficult compared to the opportunities that of men.

RESULTS

Biological sex and gender

In English, there are two equivalents of defining the concept of gender is sex understood as biological sex and gender understood as gender. Biological sex is a set of physical characteristics that differentiate women and men. These features are universal and unchanging. Conversely, the term gender in science appeared in the late 1960s of the twentieth century to show expectations of women and men in a given culture. Differentiating element is that gender is socially constructed, and therefore has the characteristics of variables. The perception of gender is subject to constant evolution as a result of changes taking place in society and is not devoid of stereotypes, which often lead to discrimination [Firlit-Fesnak and Szylko-Skoczny 2007, Matysiak 2012] Walter Lippmann [1922] in *Public Opinion*, work published in 1922, defined the concept of stereotype as "simplistic and inaccurate as a result of socially transmitted rather than personal experience, resistant to change, imagination reality, the images in our head". Define gender stereotypes so generalized beliefs about women and men, simplified descriptions of "man's man" and "femine woman". Pankowska [2005] writes that femininity is associated with the sphere of domestic life, family and motherhood and masculinity associated with work, power and public activity. That is why so much importance in efforts to equal opportunities plays a struggle against stereotypes, with simplified descriptions, which in many cases lead to discrimination. There are various forms and types of discrimination. Discrimination can occur either due to gender, but also due to age, race, nationality, disability, religion, ethnic origin, religion or sexual orientation. In the context of gender studies there is the concept of "gender socialization" as a list of the standards and practices of which the individual is subjected in society in different periods of life [Majewska and Rutkowska 2008]. Knowledge of these processes allows to explore and predict the behaviour of social groups and aware of the differences and similarities in the roles performed by women and men. The gender perspective free from emotions, in this study where research is concentrated on the labour market topics, is therefore both necessary and beneficial for cognitive and practical purposes.

The economic importance of the equality policy

The perception of the needs of equal opportunities by gender is important in economic terms. It is noted that the relationship between higher levels of economic growth and respect for the rights of equality, since higher level of development leads to progress in areas such as education, culture and health care. The higher the activation of women in the labour market, the greater the growth of the domestic product by using larger labour force in qualitative and quantitative terms. Gender equality brings economic benefits, and its absence compounded losses. Equal opportunities between women and men contribute to enhancing the competitiveness of the economy and better economic performance. Awareness of equality leads to positive change in society. It helps to overcome stereotypes and improve the quality of life. Gender equality has a positive impact on the economic result of the whole economy. This is expressed through the ability to achieve higher GDP, alignment still existing pay gap which is not justified by objective reasons. The equal chances in addition to the quantitative aspects has also the qualitative aspects. It brings increasing women's participation in the labour market, namely the aspect of diversity. The incorporation of gender mainstreaming in all areas of activity and policies of the EU and member states also add arguments for improving economic efficiency.

Discrimination based on sex brings the decrease in efficiency. A situation in which the economic role of individuals is determined by the sex and not their abilities and skills, leads to inefficiency. In order to eliminate discrimination and segregation can be achieved growth of the labour force with different skills and thus improve the process of organization of work. The participation of women in the economy on an equal base as men can also have positive effects on family life, if the interests of women will be supported by a policy of promoting a balance between family and work roles [Parlament Europejski 2007].

The principle of equality is one of the main objectives of the European Union. Records relating to equal opportunities for women and men are in the Amsterdam Treaty and European Council regulations governing the implementation of the European Social Fund in all EU countries.

On the labour market are some phenomena and processes related to the discrimination relating to gender, which operate under the lapidary names, they are: *glass ceiling*, *glass walls*, *sticky floors*, *tokenism*. As the glass ceiling is determined "obstacles faced by women having managerial functions and it symbolizes the visibility of promotion while its incomprehensibility". The result is that women are rarely represented in top positions and rarely reach the areas associated with power. Glass wall is a term relating to the situation in which women often work in peripheral, secondary positions with the poor prospects for promotion. Sticky floor is the term that describes a situation of women dominance in low-income occupations and prestige, where opportunities for promotion are limited (e.g. secretaries, hairdressers, etc). Tokenism – the term for the situation, where the presence of very few women in groups or in positions dominated by men and it gives incorrect illusion of existing gender equality and thus "releases" with responsibility for the maintenance of discriminatory attitudes and behaviour [Sawicka 2009, 2013].

Equal opportunities for women on the labour market – assessment of the situation

Gender is one of the main characteristics to be included in the statistics of the labour market. Many of the issues in this area presented are divided into groups of men and women. Individual capabilities, predisposition and the decisions of workers and persons seeking employment are varied depending on gender [*Kobiety i mężczyźni na rynku pracy* 2014]. Promoting the principle of gender equality in employment is considered to be an essential element of economic and social development and is a key mechanism to fight against unemployment and poverty. It is also an important factor contributing to the increase of the economic independence of women. Working women bring their contribution to the household resources, which cause the greater economic independence and empowerment of women [United Nations Economic Commission for Europe 2015]. Despite this unequal gender participation, especially of women, still represents an obstacle to sustainable development.

Human Development Report 2010 introduced the index of gender inequality index (GII), which illustrates the inequality between women and man in the following dimensions: health, participation in society and the labour market. The indicator can range from 0 to 1, and when closer to 1 the disparities between the sexes are greater. Analysis of data shows that women are often discriminated in such dimensions as: health, education or the labour market, which in turn leads to restrict their freedom. There is a great diversity between regions: from Slovenia 0.021 to 0.320 in Romania. Large imbalances in the position of the sexes take place in the countries of Central and Eastern Europe, to contribute to this low participation of women in representative bodies, including the Parliament, and a lower percentage of women in the labour force. Gender inequality index for Poland was 0.139. In developed countries is noted greater equality between women and men in terms of education and their position on the labour market. However, many Member States have problems with the proportional representation of women in the public institutions including the Parliament [*Human Development Report* 2013] (Fig. 1).

Another indicator which shows gender equality is gender equity index (GEI), which measures the level of inequality of women and men in different areas of life and includes several indicators representing three dimensions, which measure differences between women and men in three key areas, i.e. education, participation in the economy and gender equality (empowerment). A country in which women and men have equal access to education is a value of 100 points on the index. The maximum number of points does not mean that the quality for example, in education in both cases is identical. A similar situation occurs in the other two dimensions. The value of the GEI is the arithmetic mean of these dimensions. Gender equity index in the various EU Member States ranges from 0.63 in Malta to 0.88 in Finland. Also in this case there are differences between the countries of Central and Eastern Europe, and the rest of the UE, especially Scandinavian countries. Poland with a score of 0.76 is in the middle. The lowest level of inequality between women and men exists in the Nordic countries, where GEI achieved the highest values (Fig. 2).

Another indicator for measuring gender equality is gender equality index. This indicator is based on the following domains: jobs, money, knowledge, power, health, time. An indicator of Gender Equality Index can take values from 1 to 100, where 100

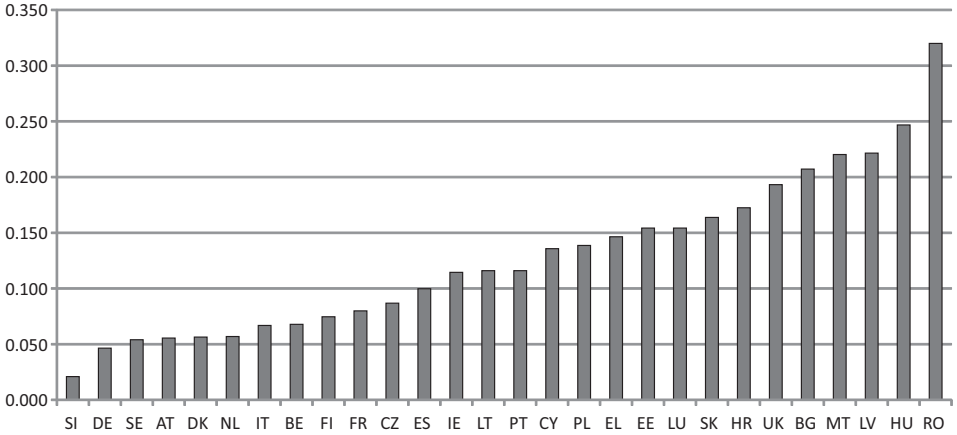

Fig. 1. Gender inequality index (GII) in the 2013 (countries codes according to UE Inter-institutional style quide)

Source: Own calculations based on retrieved from on-line report of UN Development Programme retrieved from http://hdr.undp.org/en/content/table-4-gender-inequality-index.

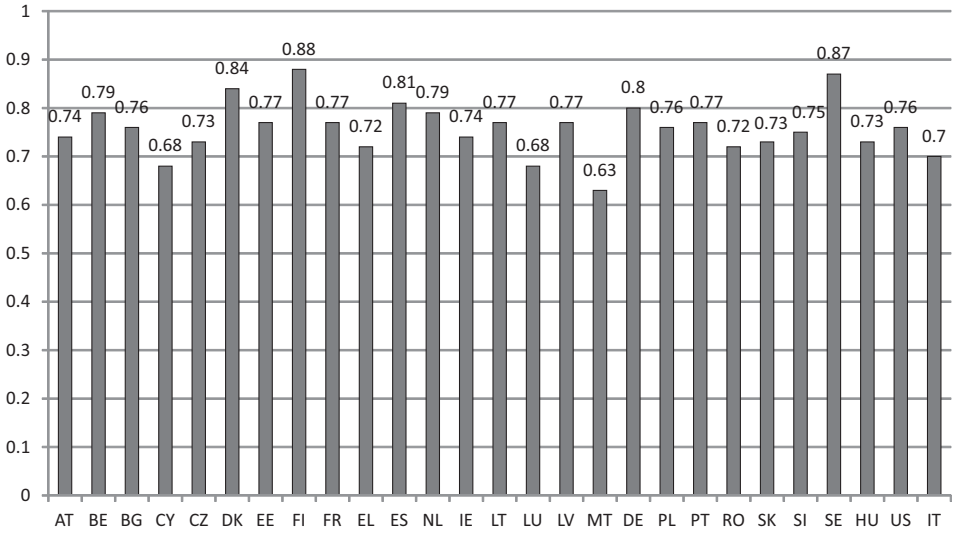

Fig. 2. Gender equity index (GEI) in the 2012

Source: Own calculations based on on-line Social Watch report retrieved from http://www.socialwatch.org/node/14367.

means the best of the situation. Also analysis of this indicator shows that there are differences between EU countries from a gender perspective. The average score for the EU countries stands at 53 points, which is far from accepted gender equality. There is a big discrepancy between Member States: from 33.7 points in Romania to 74.2 in Sweden. Four Member States again achieve results that far exceed the average of the EU:

Sweden, Finland, Denmark and the Netherlands. Poland takes 9th position from the end. As in the case of previous measures, as well as the Gender Equality Index reaches the highest values in the Nordic countries. The low value is in the Mediterranean countries (Fig. 3).

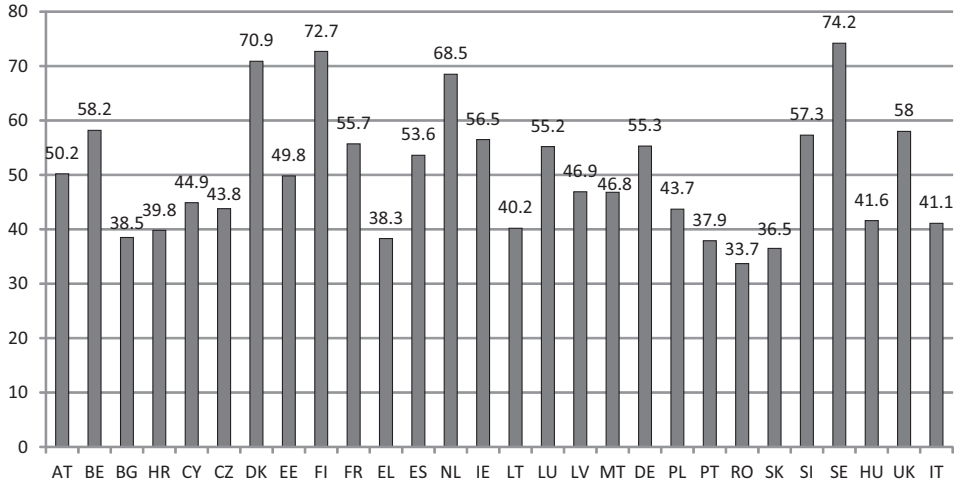

Fig. 3. Gender equality index in the 2012

Source: Own calculations based on European Institute for Gender Equality [2015].

In the European Union the strategic objective is adopted in the perspective of 2020 to have 75% the employment rate both in women and men groups. Despite the fact that the employment rate for women rose to 63% of it, still it is lower in comparison with the rate of employment of men, which was 75%. To improve the situation of women in the labour market has contributed to a certain extent the financing of the EU funds: in the years 2007–2013 investments in childcare facilities and to promote the participation of women in the labour market is endowed with the estimated amount of 3.2 billion EUR from the structural funds, which caused a considerable multiplier effect [*Równość płci: stały postęp dzięki działaniom UE* 2014].

A major problem of the modern world there are disparities in the pay gap between women and men, called the pay gap. This phenomenon is international in nature and occurs around the world, both in Europe and in Poland. Numerous surveys confirm the existence of this phenomenon. For these comparisons to be used is the gender pay gap (GPG) referred to as the difference in percentage points between the level of the average gross wage per hour of work for men and women, expressed as a percentage in relation to the wages of men. According to Eurostat, in 2013 in the EU as a whole, the women's earnings were on average 16% lower than men's. GPG indicator was varied and amounted to, from 3.2% in Slovenia to 30% in Estonia (Fig. 4).

The size of the GPG ratio varies considerably between Member States. The cause of the differences in the remuneration of women and men are not objective phenomena, because formally women are better educated than men, the differences were rather as

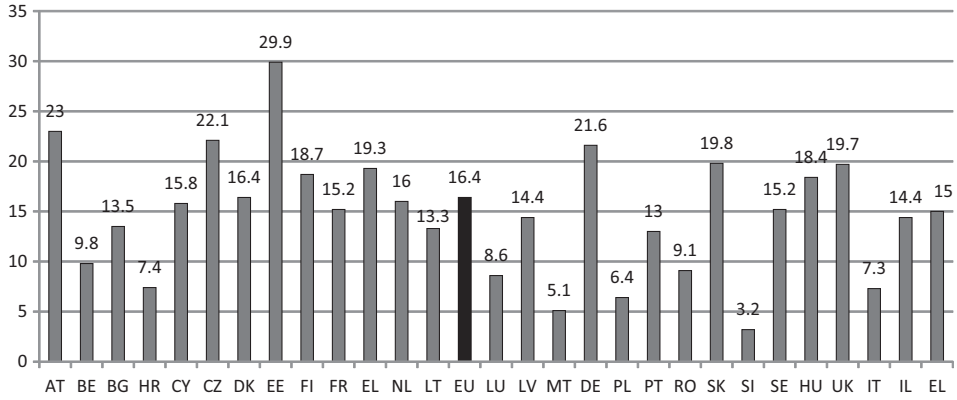

Fig. 4. Gender pay gap (GPG) in the UE Member States, 2013 (%)

Source: Own calculations based on Eurostat newsrelease from 5 March 2015. Retrieved from http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tsdsc340&plugin=1.

the result of historical discrimination and the underestimation of women's competences and skills. Work which women do still is seen as less valuable, and women's remuneration for tasks requiring from a man of similar qualifications or experience are generally lower. Differences also arise from segregation in the labour market, prevailing gender stereotypes and the obligation to reconcile working life with family life, which mostly affects women. Occupations in which women predominate are generally worse paid, and in management positions well paid, are dominated by men.

In 2014, the average participation of women on the boards of large listed companies in the EU amounted to 20%. The highest level of representation of women was taking place in such countries as France and Latvia (32%), Finland (30%) and Sweden (28%). In Slovenia, Belgium, Denmark, Italy and Germany on the boards of listed companies were at least 20% of women. In the Netherlands, every fifth woman participates in committees of listed companies. The lowest level of representation of women was in Malta, the Czech Republic, Estonia, Greece, Cyprus and Portugal. In Poland, this level was 15%, which means that it is below the EU average (Fig. 5).

The role of women is seen very stereotypically, then she should resign from professional work to raise children. As a result of which women are more likely to forgo work and not keep coming back to it full time after the birth of a child.

The difference in the distribution of domestic and family responsibilities is one of the main factors contributing to the formation of the pay gap and women lower rate employment. The existence of the pay gap and a shorter time to women's work means that, in future, they will receive a lower pension as compared to men.

According to the European Commission, the difference in the amount of pensions for women and men is 39 p.p. [*Równość płci: stały postęp dzięki działaniom UE* 2014]. The consequences of unequal wages can be seen earlier than retirement. In sociological sciences you will encounter the concept of the feminization of poverty, which means

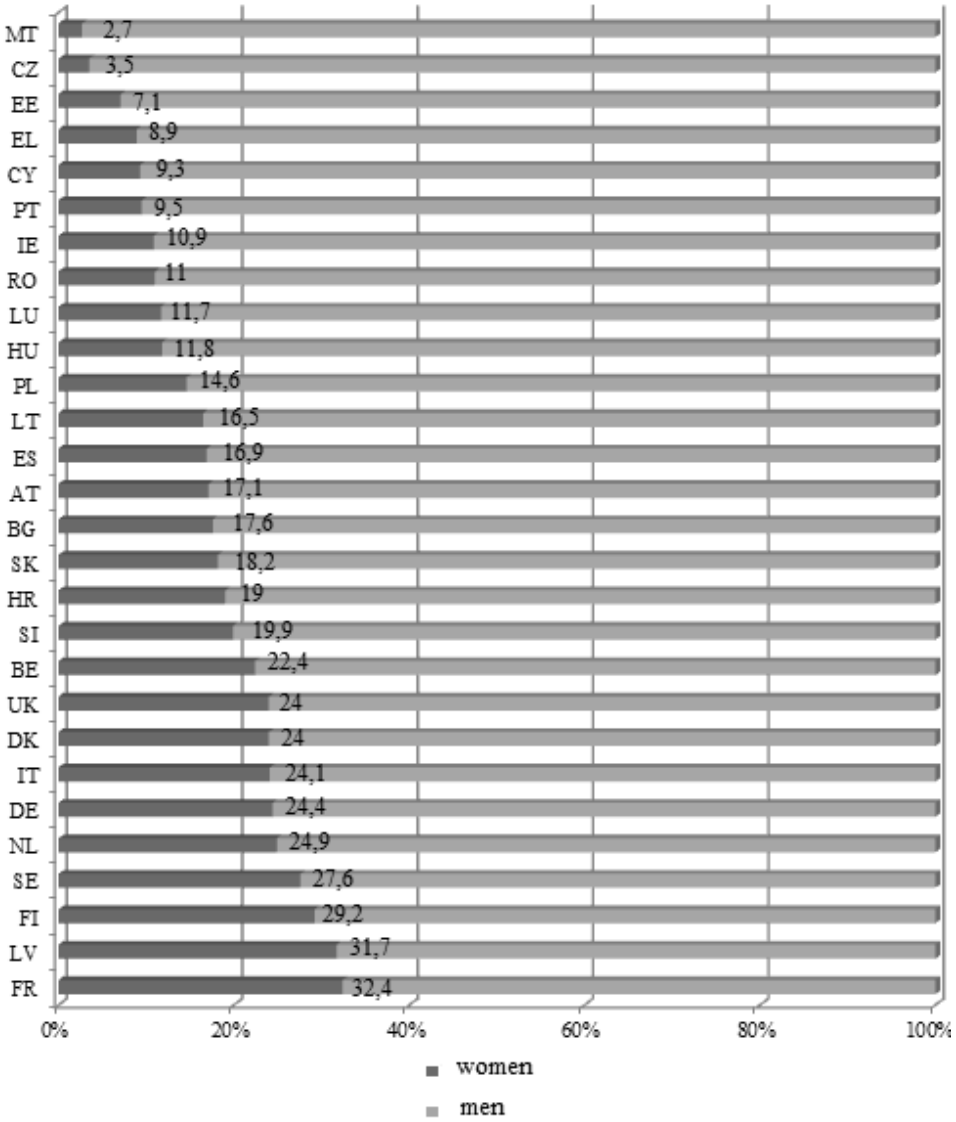

Fig. 5. Representation of women and men on the boards of large listed companies in the EU, October 2014

Source: Own calculations based on European Commission [2015].

that women and their children more often are exposed to poverty and social exclusion. Besides women as opposed to men have lower self-esteem and lower expectations. Are less likely to negotiate the salaries because they believe that will have a negative effect on the employment decision. Significant change is needed also in the mentality of the workers. Break with the commonly perceived stereotype perceptions women as mothers and

wives, and only later as an employee. The participation of women in the labour market is increasing in most countries, but still remains lower compared to men. The most common causes of this include: inflexible working hours, which are not compatible with the obligations of the mother, the inability to work part-time, the unequal distribution of family responsibilities associated with home work and the care of children, gender roles, stereotypes and attitudes related to gender, difficulties in entering the labour market after the birth of a child. It has been reported that women who do not have children attain higher employment compared with women who are raising children [United Nations Economic Commission for Europe 2015].

The situation of women on the labour market in Poland

Over the years 2010–2013, the share of economically active women increased by 1 p.p. and accounted for 49% of the labour force ratio for comparison, men accounted for 64% of the vote. This means that the level of participation of women is still lower than that of men. In 2013, per 1,000 active population men, there were 554 inactive, while the active population per 1,000 women fell to 1,060 inactive. A group of passive population working for the most part are women, which is 61% of the population. Therefore, you can talk about feminization of passive population. By analyzing the ratio of professional activity by age, it turns out that this distribution is slightly different among women and men. The highest percentage of women in the economically active age 40–44 years, whereas among men aged 35–39 years, the highest level of women's professional activity is visible in the case of women with higher education, close it is to the index for men, the difference in this case was less than 5 p.p. while for other levels of education ranges from 15 to 23 p.p. [*Kobiety i mężczyźni i na rynku pracy* 2014].

The level of unemployment was higher for women than men. In the years 2010–2014 the rate of unemployment among women and men decreased by 0.8 p.p., and in 2014 amounted to 9.3% for women and 7.4% for men. The structure of unemployment in the various age groups is identical to that in the population of men and women. This means that the highest rate of unemployment in the case of the youngest. The number of people out of work is definitely lower in the case of women and men representing higher education [*Kobiety i mężczyźni i na rynku pracy* 2014].

Compared to men, more women working in the public sector, i.e. up 18% for men and 33% for women. Women predominate as employed persons, the small proportion of women as employers and self-employed persons. The most feminized section of the national economy include: health care, social welfare and education, in which women were about 8 out of 10. The largest group, both women and men, carries out work for 40–49 hours a week. There are not seen significant differences in this respect between women and men. Analyzing the employment of women and men employment shows that the highest proportion of women work in services, while men dominate especially in industry and agriculture. Women as often as men are employed on the basis of contracts for an indefinite period, however, there are differences according to age. In a group of younger workers, i.e. 15–24 years, the proportion of men having a contract for an indefinite period is 7 p.p. higher than women's [*Kobiety i mężczyźni i na rynku pracy* 2014].

CONCLUSIONS

In the study there was presented the economic and social dimension of inequality of the population of women in the labour market. For this purpose, it were used the comparisons from different European Union countries. It was noted a correlation between higher levels of economic development of the country and the existence of democratic rights in the area of gender equality. This applies to the equal opportunities for women on the labour market, but also the presence of them in the sphere of culture or education.

On the labour market are some phenomena and processes related to the discrimination relating to gender, which operate under the lapidary names, they are: *glass ceiling*, *glass walls*, *sticky floors*, *tokenism*.

The population of women in comparison with men's reaches lower indicators of labour and employment, in turn, the higher is the level of women unemployment. Statistics show more difficult situation of women in the labour market. The causes of women inequality is to be found much often in less developed economies. The lack and scarcity of the institutional care of children and other dependents is influencing women professional activity much more than men, especially for women returning to the labour market after a longer break (maternity live).

Another indicator of the infer position of women in the labour market is undervaluing their work through what women in comparison to men receive lower wages.

REFERENCES

Firlit-Fesnak, G., Szylko-Skoczny, M. (2007). Polityka społeczna. Podręcznik akademicki. Wydawnictwo Naukowe PWN, Warszawa.

Gender balance on corporate boards (2015). Europe is cracking the glass ceiling. European Commission, January.

Gender Equality Index (2015). European Institute for Gender Equality.

Human Development Report (2013). The Rise of the South: Human Progress in a Diverse World. New York.

Kobiety i mężczyźni i na rynku pracy (2014). GUS, Warszawa.

Lippmann, W. (1922). Public Opinion. Merchant Books, New York.

Majewska, E., Rutkowska, E. (2008). Równa szkoła – edukacja wolna od dyskryminacji. Poradnik dla nauczycieli i nauczycielek. Dom Współpracy Polsko-Niemieckiej, Gliwice.

Matysiak, I. (2012). Rola sołtysów we współczesnych społecznościach wiejskich. Płeć jako czynnik różnicujący kapitał społeczny. manuscript of Ph.D. thesis in library of Institute of Sociology in Warsaw University, Warszawa.

Pankowska, D. (2005). Wychowanie a role płciowe. GWP, Gdańsk.

Parlament Europejski. Dyrekcja Generalna ds. polityk wewnętrznych, PE 379.206, 22.05.2007. Uwzględnianie problematyki płci (gender mainstreaming) przy wykorzystywaniu funduszy strukturalnych.

Równość płci: stały postęp dzięki działaniom UE (2014). Press release from 14.03.2014. Bruksela.

Sawicka, J. (2009). Sytuacja kobiet wiejskich na rynku pracy i w rolnictwie. [In:] J. Piotrowska, A. Grzybek (Eds). Raport. Kongres kobiet Polskich. Kobiety dla Polski. Polska dla Kobiet. 20 lat transformacji 1989–2009. Fundacja Feminoteka, Warszawa.

Sawicka, J. (2013). Makroekonomiczne i społeczne uwarunkowania zmian na rynku pracy z perspektywy gender. [In:] J. Sawicka (Ed.). Rynek pracy na obszarach wiejskich Mazowsza – perspektywa gender. Wyd. SGGW, Warszawa.

United Nations Economic Commission for Europe (2015). Indicators of gender equality. New York and Geneva.

PŁEĆ A ZRÓWNOWAŻONY ROZWÓJ GOSPODARCZY – RÓWNOŚĆ SZANS KOBIET NA RYNKU PRACY

Streszczenie. Artykuł zawiera podstawowe kwestie polityki równości szans i równości płci. Dyskutuje się i ocenia ekonomiczny wymiar polityki równościowej. Dokonano oceny sytuacji kobiet na krajowym i europejskim rynku pracy. Przyczyny mniejszego udziału i zatrudnienia kobiet, jak i ich dyskryminacji na rynku pracy zostały omówione. Badania statystyczne potwierdzają, że zarówno w Polsce, jak i w krajach Unii Europejskiej istnieją istotne różnice w poziomie płac (rozpiętość w wynagrodzeniu według płci). Zestawienie takich mierników jak GII, GEI i GPG wskazuje na wyraźny podział na grupy krajów: kraje rozwinięte (w tym głównie skandynawskie), gdzie różnice według płci nie występują lub są nieznaczne, grupa krajów z basenu Morza Śródziemnego, gdzie sytuacja kobiet jest bardziej wrażliwa na wpływ stereotypów i tradycyjnych wzorów, oraz słabiej rozwiniętych krajów z Europy Środkowej i Wschodniej, gdzie kobiety wciąż nie mają równych szans na rynku pracy.

Słowa kluczowe: polityka równości szans, rynek pracy, różnice w wynagrodzeniu kobiet i mężczyzn, Unia Europejska, Polska

Accepted for print: 22.11.2015

For citation: Sawicka J., Łagoda J. (2015). Gender and sustainability in the economic development – equal chances for women at the labour market. Acta Sci. Pol., Oeconomia, 14 (4), 115–125.

ACTA SCIENTIARUM POLONORUM
ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl
Oeconomia 14 (4) 2015, 127–138

THE CHARACTERISTICS OF EXPORTERS AMONG HIGH-TECHNOLOGY MANUFACTURERS BASED IN WARSAW

Agnieszka Skala, Katarzyna Rostek
Warsaw University of Technology

Abstract. The goal of presented study was to identify and describe the high-tech manufacturing sector (HT) in Warsaw and to indicate the part having the highest market potential. Based on the results of previously executed studies, the sub-sector of HT-exporters (HTME) was identified as the most promising group of companies in the high-technology sector. In the article, the description of this sub-sector is presented and its specifics are discussed. Their legal status is more frequently corporate, their size is larger (in terms of the number of employed), as well as the scope of their cooperation with regard to science and the self-assessment of innovativeness. The assumption that the exporters of high-technology products are elite among HT manufacturers has been confirmed.

Key words: entrepreneurship, high-technology, exporters, manufacturing, identification criteria

INTRODUCTION

The basic classification of the industry, in terms of its technology level, divides it into four categories: high-technology, medium-high technology, medium-low technology, and low-technology [OECD 1995]. The high-technology group is important to the economy and has a significant impact on the nature and pace of economic growth in developed countries. The major distinction splits the HT sector into two groups: manufacturers and service providers. However, the HT-services group is not the subject of this study, which is focused exclusively on the high-tech manufacturing branches, which are electronics, pharmaceuticals, aviation and spacecraft.

Corresponding author: Agnieszka Skala, Warsaw University of Technology, Faculty of Transport, Koszykowa 75, 00-662 Warszawa, Poland, e-mail: askala@wt.pw.edu.pl

Although the statistics and research is conducted on the high-tech sector, the definition of this term continues to be rather ambiguous [Steenhuis and de Bruijn 2006, O'Regan and Sims 2008]. As many as 19 definitions of tech-company have counted Grinstein and Goldman analyzing literature only until 2000 [Grinstein and Goldman 2006]. This ambiguity makes the companies included in the HT sector being drawn as a rather homogeneous group gathering similar entities, when in fact it can be very varied and uneven in terms of market potential and development stage. The boundaries between sectors in the economy gradually disappear in the process of "the industry convergence", which also affects one of the most important HT industries: pharmaceuticals [Gierszewska 2012]. Is an ongoing debate around the question of the criteria under which companies can be considered as belonging to the high-technology industry, and which cannot.

Classification into the high-technology industry may be done on the basis of affiliation to a sector of the economy (the sectorial approach) or goods produced by them (the product approach) [Skala 2014]. According to the sectorial approach, high-tech production category now includes companies, which declares their main activity in any of three kinds of production: pharmaceuticals, electronics, and air- and spacecraft. On the other hand, in the product approach there are nine groups of goods being the result of the production processes: aerospace computers and office machines, electronics/ /telecommunications, pharmacy, scientific instruments, electrical machinery, chemistry, non-electrical machinery and armament.

Given the above, the scope of this study is to explore the criteria that distinguish the HT-sector companies which have a positive impact on the economy.

There are factors characterising the high-tech sector that are mentioned in literature. Among them the high level of the innovativeness of processes or final products is highlighted as well as the fact of creation of the stable well-paid jobs for highly skilled workforce [Stuart 2000, Christensen and Raynor 2003]. These are highly productive and competitive companies [O'Regan and Sims 2008, Zakrzewska-Bielawska 2011], that raise the technological level throughout the entire economy [Nelson 2014] usually having extremely short product lifecycles [Steenhuis and de Bruijn 2006] and cooperating with science. The high market and investment risk in the sector is compensated by a potential profit from successful investment and a long-term benefit for the market and economy [O'Regan and Sims 2008, Olsson and Schuller 2012]. Moreover, irrespectively of the selection criteria used, the HT companies provide an excellent space for research on the latest trends in technologies, management, and marketing [Zakrzewska-Bielawska 2012].

While searching for the criteria distinguishing high-tech companies, the high propensity to export appears often in the research results [Filatotchev et al. 2009]. A popular argument is that firms that export grow faster and stronger. Studies confirm the positive relationship between the export activity and the high productivity [Mostafa et al. 2005, Hessels and van Stel 2011] as well as the share of employees with higher education in total employment and the level of expenditures on R&D [Cieślik et al. 2014]. Simultaneously, all three features: high productivity, raised share of employees with higher education and a high level of R&D expenditure are characteristic of HT companies.

Therefore, the main objective of the present research was to indicate the characteristics of the part having the highest market potential. The realization of this goal required the development of the characteristics of the research group, which was the population of Warsaw's high-tech manufacturers. This analysis was used also to search for new, atypical and specific characteristics distinguishing leading companies in the study group. The result is a characterization of the high-tech Warsaw with particular emphasis on the role and importance of exports.

METHODOLOGY

The initial purpose of the research was to provide material for the description of the Warsaw high-tech sector. However, it revealed a major difficulty in identifying the HT entities. Therefore, the first step was to identify HT companies from amongst other business entities registered in Warsaw. The basic criterion for qualifying companies as high-tech, which is based on the PKD declared by the companies, was recognized as not reliable. Therefore, a need arose to define a new method that would provide an unequivocal answer to the question about which companies should, and which should not, be regarded as high-tech. A hybrid method was proposed, which combined the data from GUS, ZUS, and information available online [Rostek and Skala 2014a, Skala 2014]. The second step was aimed at characterizing the HT sector (137 entities) using analytical methods enriched by the data obtained from the companies' websites [Rostek and Skala 2014b]. The goal of the third step was to differentiate it from other sectors, and to find the features that create its special nature [Rostek and Skala 2014c]. In the course of the research, the fact that being an exporter company was indicated as one of the strongest features characterizing the population of the high-technology group of companies. The fourth stage of the research was dedicated to exporters.

At this stage of the research, in addition to the sources of information previously used, a new source of data was used. Analytical Centre of Customs Office (CAAC) has provided the information on exporters among Warsaw companies in 2012. Nine new attributes supplied the information about the range of export value, the main destination of exports, and the number and directions of export destinations. The classification of attributes used in the study follows the structure shown in Table 1.

The first operation to do was to identify the research group of the HTME. The Warsaw population of 137 HT manufacturers was compiled with the population of exporters (16,241 entities) operating in Warsaw as well. It appeared that 110 of the 137 HT entities selected were amongst the companies that showed exports in the period considered. Among them, 61 (55%) have a "Z" value and have been considered as inactive exporters. The type of exported products in the remaining group of 49 companies has been verified and 12 of them did not export any HT products. Hereby, the final population of firms being simultaneously HT manufacturers and HT exporters has been identified in a number of 37. The group of the selected 37 HTME is the subject of this study. The algorithm, which led to the identification of HTME group, is shown at Figure 1.

Table 1. Classification attributes of HTME within all datasets

Used at the number of research stage	Attribute		Data source
	name	description	
1, 2, 3, 4	REGON	REGON number; set identifier	GUS[a]
	HiTech	PKD[b] group	GUS
2, 3, 4	FP	specific legal form	GUS
	FZ	share of foreign capital	GUS
	EMPLN	number of employees (ranges)	GUS
1, 2, 3, 4	WA	activity indicator	ZUS[c]
2, 3, 4	B2B	type of sale: B2B	website_1study
	B2C	type of sale: B2C	website_1study
	CERT	certificates	website_1study
	ACTIV	assessment of activity	website_1study
	LANG	website in foreign language	website_1study
	SCIENCE	cooperation with science centres	website_1study
	PATENT	patents	website_1study
	EMPL	searching for new employees	website_1study
	SOCIAL	social networking service account	website_1study
	EXPORT	export activity	website_1study
	INNO	self-assessment of innovative nature	website_1study
4	EXPORT_12	range of export value in 2012	CAAC[d]
	EXPORT_C	main destination of export in 2012 (country)	CAAC
	E_C/E %	% of the export value to the main destination	CAAC
	E_EU/E %	destination to EU as % of total exports	CAAC
	N_EU	number of exports destinations in EU (countries)	CAAC
	N_nEU	number of exports destinations outside EU (countries)	CAAC
	N_All	number of all exports destinations	CAAC
	HT_G	group of high-tech products exported	CAAC
	E_HT/E %	high-tech products export value as % of total export value	CAAC
	Research-oriented	based on research centre, having laboratory, established by scientists etc.	website_2study
	Successor	the company is continuing activity of ormer state institution or company	website_2study

[a] GUS – National Office of Statistics; [b] PKD – Polish Classification of (business) Activity (NACE codes); [c] ZUS – Social Insurance Institution; [d] CAAC – Analytical Centre of Customs Office.

Source: The authors' research.

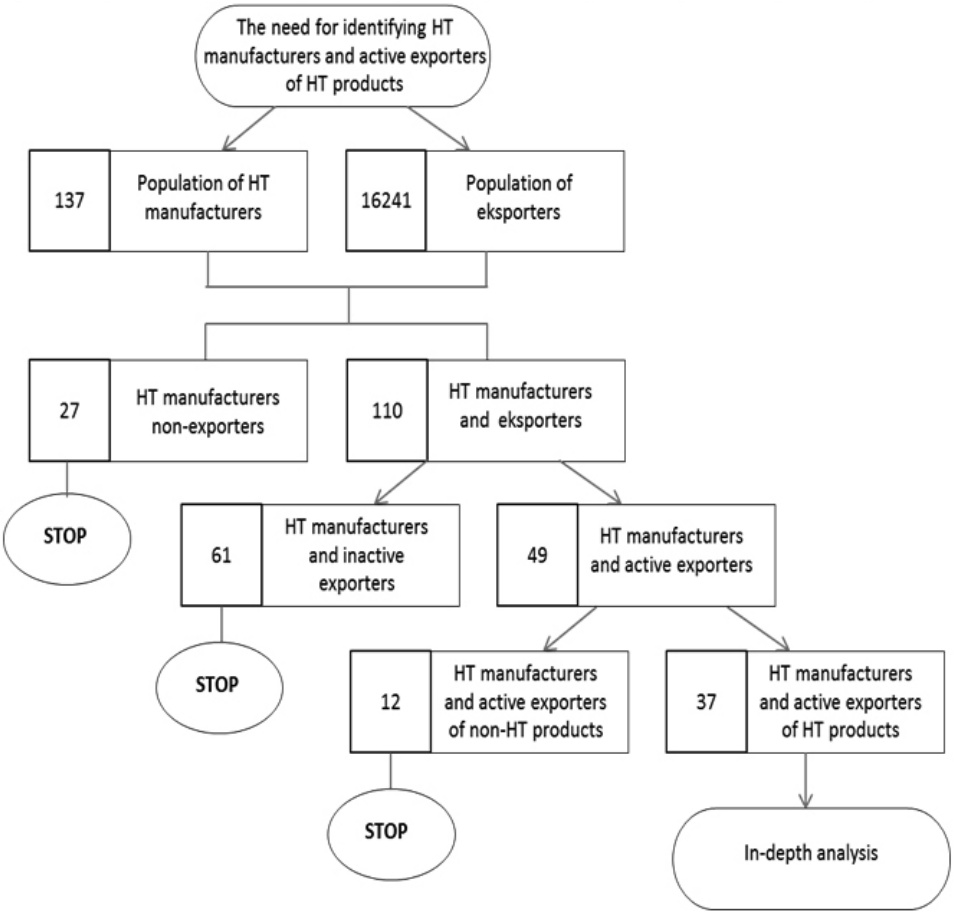

Fig. 1. The algorithm that led to the identification of HTME

Source: The authors' research.

RESULTS AND CHARACTERISTIC OF HTME

The analysis of the HTME group will be divided into parts corresponding to the sources of data. The results of the first part of the analysis, which was based on information from GUS and ZUS are shown (Table 2).

There are four types of businesses that dominate among the HTME entities. These are manufacturers of instruments and appliances for measuring, testing and navigation (nine entities), manufactures of computers and peripheral equipment, manufacturers of pharmaceutical preparations, and manufacturers of electronic components.

This structure is similar to that which occurs in the whole group of HT manufacturers, although it is worth noting the total lack of aircraft and aerospace industries in the HTME group. As many as 26 out of 37 (70%) HTME entities have chosen the legal

Table 2. Attributes distribution characterizing HTME (within GUS/ZUS datasets)

Attribute		Distribution of value		
name (REGON)	description (REGON number; set identifier)	value (Individual number)	quantity	% of population
HiTech	PKD group, main activity executed	2,110 manufacture of basis pharmaceutical substances	3	8.1
		2,120 manufacture of medicines and other pharmaceutical products	5	13.5
		2,611 manufacture of electronic components	4	10.8
		2,612 manufacture of electronic printed circuits	2	5.4
		2,620 manufacture of computer and periferal equipment	5	13.5
		2,630 manufacture of telecommunication equipment	3	8.1
		2,640 manufacture of consumer electronic equipment	2	5.4
		2,651 manufacture of measuring control and navigational instruments and equipment	9	24.3
		2,660 manufacture of radiating equipment, electromedical and electrotherapeutical equipment	2	5.4
		2,670 manufacture of optical instruments and photografic equipment	2	5.4
		2,680 manufacture of inrecorded magnetic and optical media	0	0
		3,030 manufacture of aircrafts, spacecrafts and similar machinery	0	0
FP	Specific legal form	16 joint-stock company	10	27
		17 limited liability company	16	43.2
		18 general partnership	3	8.1
		19 civil law partnership	1	2.7
		99 one-man business	7	18.9
FZ	Share of foreign capital	0	34	91.9
		1	3	8.1
EMPLN	Number of employees (ranges)	0–9	14	37.8
		10–49	11	29.7
		50–249	7	18.9
		250–999	3	8.1
		> 999	2	5.4
WA	Activity indicator	0	0	0
		1	37	100

Source: The authors' research.

form of a corporation (stock corp. or limited liability company), while in the HT group, this share is also high, but reaches only 50%. Only three companies in the HTME population have foreign equity participation (two pharmaceutical companies and one electronics manufacturer), which is similar for the entire group of HT also dominated by Polish capital.

Information about the size of employment in HTME indicates values greater than the average, but the data is not very reliable, because it refers to the situation at the time of registration of the company. All surveyed companies pay contributions to ZUS, which means that they are active and that they employ workers.

The results of the second part of the analysis, which is based on information from the first screening of the companies' websites_1study, are shown in Figure 2.

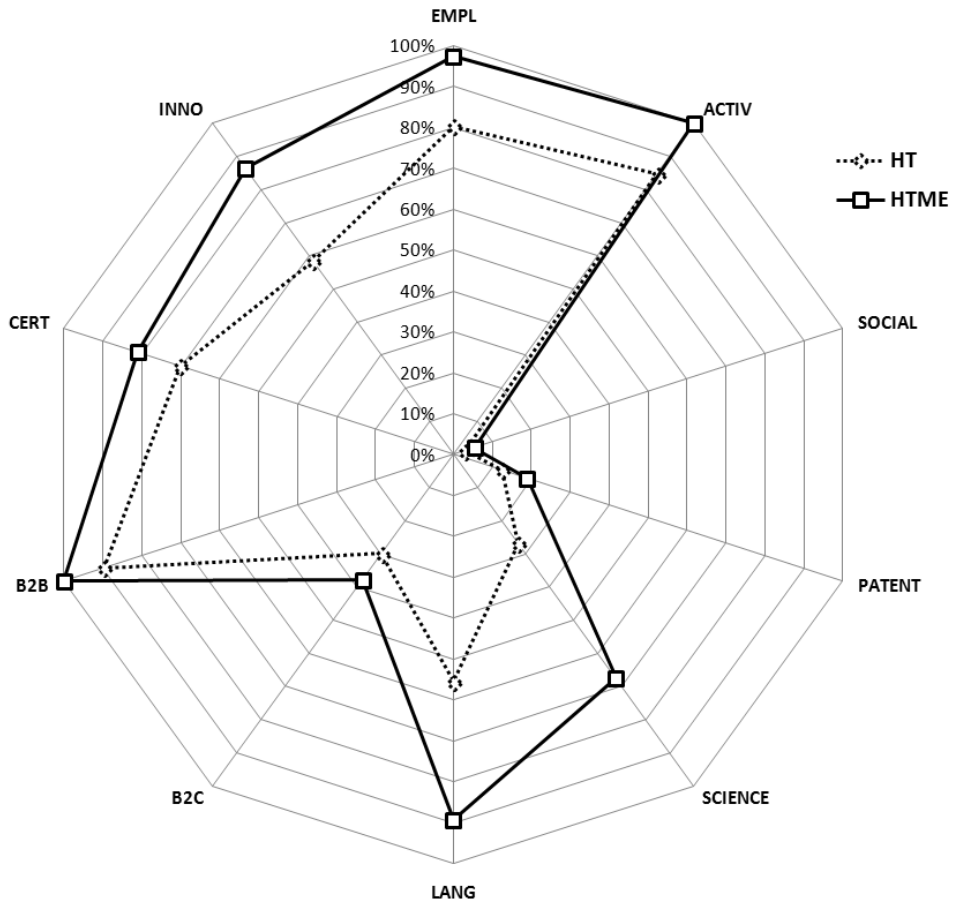

Fig. 2. A comparison of the HT and HTME groups in terms of attributes obtained from the first websites screening

Source: The authors' research.

All HTME have active websites and lead sales in the B2B model. Only in one case, the website was not clear that the company is looking for and employ new workers. The vast majority has certificates (81.1% of the population), defines itself as innovative (86.5% of the population), and also maintains a website in a foreign language (89.2% of the population).

All of the HTME companies have active websites and are selling in the B2B model. Only in one case was the website information unclear as to whether or not the company employed workers. The vast majority of firms have different types of certificates, self-define themselves as innovative, and conduct their website a in a foreign language. The HTME companies outperformed the HT group in terms of holding patents and, remarkably, in cooperation with science. The share of firms holding patents has increased from 12 (HT) to 19% (HTME) and, respectively, from 27 to 70% in the second discussed. It shows that cooperation with science, defined as running a research laboratory, having an R&D department, or hiring scientists, is an important distinctive factor for companies that build their competitive advantage in foreign markets. This kind of cooperation may be related as well to the possession of the certificates, which have up to 80% HTME (compared to 58% in the HT group). A comparison of the HT and HTME groups in terms of attributes obtained from the first websites screening is shown in Figure 2. It indicates better performance of HTME compared to HT group, which justifies further, in-depth studies of this subgroup.

The results of the third part of the analysis, which is based on exports information from the CAAC, are shown in Table 3. Among the HT products exported by HTME companies, four products clearly dominate with regard to distribution of value: electronics and telecommunications equipment, scientific instruments, and pharmaceuticals. With regard to the value of the exports, the population has been divided evenly between exporters who sold abroad goods worth up to 1 million PLN in 2012 (19 companies) and those who exceeded this value (18 companies). No HTME company sold HT products for more than 128 million PLN.

The attribute EEPORT_C means a country where the largest share of a company's exports is sold. During this research, 23 countries were identified, of which four countries were indicated by more than one firm. Results indicated Germany: twice times, UK: three times, and Russia and the Ukraine: five times each. This means that in the HTME population there is a significant group of companies (10 entities), whose primary foreign trade partners are Russia or the Ukraine. Other 10 entities indicated EU countries as the primary destinations for their exports. On the other hand, 22 companies (60%) did not export to the EU at all. With regards to the number of countries being export destinations, 22 companies exported to up to 10 countries, but the record holder showed as many as 57 countries as destinations (the company sells industrial measurement and control equipment). The last indicator (E_HT/E %) reflects the percentage of HT products in the total value of export. For 12 firms (1/3 of HTME) HT products represented 100% of the exports. For 2/3 of them, HT products represented at least 50% of the export value.

While screening HTME websites, two additional attributes of the group were identified (Table 4). The first concerns the cooperation with science. The attribute Research-oriented characterizes companies that were established based on scientific institutes

Table 3. Attributes distribution characterizing HTME (CAAC datasets)

Attribute		Distribution of value		
name	description	value	quantity	% of population
EXPORT_12	range of export value in 2012 (million PLN)	< 1	**19**	**51.4**
		1–8	7	18.9
		8–64	8	21.6
		> 64	3	8.1
EXPORT_C	Main destination of export in 2012 (country)	Russia	**5**	**13.5**
		Ukraine	**5**	**13.5**
		Great Britain	3	8.1
		USA	3	8.1
		Germany	2	5.4
		Lithuania	2	5.4
		other (12 countries)	1 each	2.7 (× 17)
E_C/Exp %	% of the export value to the main destination	**1–50**	**16**	**43.2**
		51–99	14	37.8
		100	7	18.9
E_EU/E %	destination to EU as % of total exports	0	**22**	**59.5**
		1–50	6	16.2
		51–100	9	24.3
N_EU	number of exports destinations in EU (countries)	0	**22**	**59.5**
		1–10	6	16.2
		11–20	8	21.6
		> 20	1	2.7
N_nEU	number of exports destinations outside EU (countries)	1–10	**30**	**81.1**
		11–20	4	10.8
		> 20	3	8.1
N_All	number of all exports destinations	1	7	18.9
		2–10	**15**	**40.5**
		11–20	8	21.6
		> 20	7	18.9
HT_G	group of high-tech products exported	1 – aerospace	1	2.7
		2 – computers	2	5.4
		3 – electronics / telecommunications	**13**	**35.1**
		4 – pharmacy	**8**	**21.6**
		5 – scientific instruments	**10**	**27**
		6 – electrical machinery	2	5.4
		7 – chemistry	1	2.7
		8 – non-electrical machinery	0	0
		9 – armement	0	0
E_HT/E %	high-tech products export value as % of total export value	< 25	10	27.0
		25–49	3	8.1
		50–74	1	2.7
		75–100	**23**	**62.2**

Source: The authors' research.

Table 4. Attributes distribution characterizing HTME (within website_2study datasets)

Name of attribute	Description of attribute	Distribution of value		
		value	quantity	% of population
Research-oriented	based on research centre, having laboratory, established by scientists etc.	1	22	59.5
		0 or ?	15	40.5
Successor	based on research centre, having laboratory, established by scientists etc.	1	9	24.3
		0	28	75.7

Source: The authors' research.

cooperating with them, running their own scientific labs, or entities founded by (former) scientists. The second attribute Successor, characterizes entities that continue the tradition of the former state companies or institutions, established long before the Polish economy transformation in 1989. The analysis shows that the so-defined HTME subgroup is relatively significant and particularly interesting.

The results of the last part of the study showed that 59% of the HTME companies have close relationships with the world of science, and every fourth entity was founded on the basis of the old state-owned enterprises or institutes.

CONCLUSIONS

To sum up the findings of the study, we must conclude that the high-tech manufacturers and exporters based in Warsaw are mainly producers of pharmaceuticals, electronics and electronic components, subsequently. They sell exclusively to other business entities (B2B type of transaction). Their legal status is more frequently corporate, their size is larger (in terms of the employment). They show strong cooperation with science, including certificates or patent holdings. It is worth noting that their export destination to the East is more popular than to the West, and this tendency includes the highest value exports as well. HTME companies export their products to EU countries uncommonly.

A particularly interesting result noted was that one in four analyzed HTME companies was founded on the basis of the old state-owned enterprises or research institutes. Four of them dealt with the pharmaceutical industry and five with electronics. All of them have their own laboratories, and all are commercial companies with a status of being at least a medium-sized firm (in terms of employment). These companies are continuing the old tradition of the Polish R&D and manufacturing units (like Warsaw Pharmaceutical Works, "OMIG" Radio Components Plant, "Polfa" Tarchomin Pharmaceutical Company, "Cemat," a State Company, Polish Optical Company, "FARUM" X-ray Apparatus and Medical Equipment State Company).

The research are another approximation the problems distinguishing characteristics of Polish high-tech companies after presentations in the articles Rostek and Skala [2014a, b,

c]. Further research should focus on the latter group of companies for which a rich history is likely to be important in the process of building their market position. They can help to find answers to the question of how to effectively operate in the market and flexibly adapt to changes in the environment inevitably following the economic, social and political life. This is particularly important due to the current concentration of European production financing in these areas.

ACKNOWLEDGEMENT

It is a part of the European Project entitled *Stołeczne Forum Przedsiębiorczości* (*Warsaw Entrepreneurship Forum*) – *Development, promotion and pilot implementation of new methods of collaboration between the Warsaw authorities and businesses in order to ensure efficient management of economic change*. Co-funded by the EU under the European Social Fund, agreement UDA-POKL.08.01.02-14-137/11.

REFERENCES

Christensen, C., Raynor, M. (2003). The Innovators Solution: Creating and Sustaining Successful Growth. Harvard Business School Press, Boston.

Cieślik, A., Michałek, J.J., Michałek, A. (2014). Charakterystyki firm a ich zaangażowanie w działalność eksportową. Badanie dla krajów Europy Środkowo-Wschodniej. Zeszyty Naukowe Uniwersytetu Szczecińskiego. Współczesne Problemy Ekonomiczne, 8, 31–41.

Filatotchev, I., Liu, X., Buck, T., Wright, M. (2009). The export orientation and export performance of high-technology SMEs in emerging markets: The effects of knowledge transfer by returnee entrepreneurs. Journal of International Business Studies, 40 (6), 1005–1021.

Gierszewska, G. (2012). The Japanese Model of Knowledge Management. Foundations of Management, 4 (1), 7–16.

Grinstein, A., Goldman, A. (2006). Characterizing the technology firm: An exploratory study. Research Policy, 35 (1), 121–143.

Hessels, J., Stel van, A. (2011). Entrepreneurship, export orientation, and economic growth. Small Business Economics, 37 (2), 255–268.

Mostafa, R.H., Wheeler, C., Jones, M.V. (2005). Entrepreneurial orientation, commitment to the Internet and export performance in small and medium sized exporting firms. Journal of International Entrepreneurship, 3 (4), 291–302.

Nelson, A.J. (2014). From the ivory tower to the startup garage: Organizational context and commercialization processes. Research Policy, 43 (7), 1144–1156.

Olsson, M., Schuller, B.J. (2012). Living standard, quality of life, globalization and competitiveness in the EU and the neighbour countries – an empirical analysis. Acta Sci. Pol., Oeconomia, 11 (2), 5–21.

O'Regan, N., Sims, M.A. (2008). Identifying high technology small firms: A sectoral analysis. Technovation, 28 (7), 408–423.

OECD (1995). Classification of High-technology Products and Industries. DSTI/EAS/IND/STP (95) 1.

Rostek K., Skala A. (2014a). In search of high-tech entrepreneurship: an algorithm for differentiation of business entities operating within the high-tech sector as illustrated by the example of Warsaw. [In:] J. Świątek, L. Borzemski, A. Grzech, Z. Wilimowska (Eds). Information

Systems Architecture and Technology. The Use of IT Technologies to Support Organizational Management in Risky Environment. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław, 185–195.
Rostek, K., Skala, A. (2014b). A profile of the high-technology manufacturing sector in Warsaw. [In:] I. Koładkiewicz, J. Cieślik (Eds). Shaping local business communities. Proceedings of International Conference "Entrepreneurial Cities". Stołeczne Forum Przedsiębiorczości, Akademia Leona Koźmińskiego, Warszawa, 31–46.
Rostek, K., Skala, A. (2014c). Differentiating criteria for high-tech companies. Management and Production Engineering Review, 5 (4), 46–52.
Skala, A. (2014). Nowa metoda identyfikacji przedsiębiorstw wysokiej technologii na przykładzie Warszawy. Modern Management Review, 21 (4).
Steenhuis, H.J., Bruijn de, E.J. (2006). Technology geography: studying the relationships between technology, location and productivity. International Journal of Technology Transfer and Commercialisation, 5 (3), 195–207.
Stuart, T. (2000). Interorganizational alliances and the performance of firms: a study of growth and innovation rates in a high-technology industry. Strategic Management Journal, 21 (8), 791–811.
Zakrzewska-Bielawska, A. (2011). Relacje między strategią a strukturą organizacyjną w przedsiębiorstwach sektora wysokich technologii. Zeszyty Naukowe Politechniki Łódzkiej, 1095.
Zakrzewska-Bielawska, A. (2012). The strategic dilemmas of innovative enterprises: proposals for high-technology sectors. R&D Management, 42 (4), 303–314.

CHARAKTERYSTYKA GRUPY EKSPORTERÓW NA PRZYKŁADZIE WARSZAWSKICH PRODUCENTÓW WYROBÓW HIGH-TECH

Streszczenie: Celem prezentowanych badań było wyselekcjonowanie i opisanie przedstawicieli warszawskich producentów high-tech (HT) oraz zidentyfikowanie ich wewnętrznej podgrupy o największym potencjale rynkowym. Na podstawie wyników badań wskazano eksporterów wyrobów HT (HTME) jako najbardziej obiecującą podgrupę w zakresie zdefiniowanego celu. W artykule zamieszczono szczegółową jej charakterystykę oraz określono jej specyfikę na tle wszystkich HT. Firmy te dominują zarówno pod względem obowiązującej formy prawnej, jak i liczby osób zatrudnionych. Istotne jest, że znacznie częściej i w większym zakresie współpracują z ośrodkami naukowo-badawczymi, a w swojej ocenie są innowacyjne. Wstępna hipoteza, że eksporterzy produktów HT są elitą wśród producentów HT, została potwierdzona w toku prowadzonych badań.

Słowa kluczowe: przedsiębiorczość, high-tech, eksporterzy, produkcja, kryteria identyfikacji

Accepted for print: 23.10.2015

For citation, Skala A., Rostek K. (2015). The characteristics of exporters among high-technology manufacturers based in Warsaw. Acta Sci. Pol., Oeconomia, 14 (4), 127–138.

ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

ACTA SCIENTIARUM POLONORUM *Oeconomia 14 (4) 2015, 139–147*

PRODUCTION DIVESTMENTS ON FARMS – ESSENCE, SCOPE, CONSEQUENCES

Tomasz Wojewodzic, Aleksandra Płonka
University of Agriculture in Krakow

Abstract. The purpose of the paper is to identify changes occurring on farms in relation to the limitation of their production activities. Considerable attention was paid to changes affecting the scale and organization of livestock production in regard of which recessive phenomena have been particularly visible in recent years. Observed at the beginning of the 21st century process of withdrawing Polish farmers from agricultural production should be considered a sign of structural change in agriculture. Farmers' abandonment of livestock production can be both a transitional stage of resigning from agricultural activities (palliative divestments) as well an initial stage for the farm's re-organization (repositioning, reconcentration).

Key words: divestments, farms, economic decline

INTRODUCTION

Processes of periodical limitation of production as well as liquidating business entities (including farms) constitute an integral element of economic processes described in, among other things, a theory of business cycles [Estey 1959, Snowdon 1998, Płonka and Musiał 2012]. However, intensification of the phenomenon of permanent withdrawal by farms from agricultural activities observed in Poland in the first decade of the 21st century should be considered as an important manifestation of structural changes in agriculture. Restructuring of agriculture is currently determined by three major global trends [Gołaś and Kozera 2003]:

- the relative and absolute decrease of production potential engaged in the production of food, disparaging social and economic importance of agriculture in the national economy;

Corresponding author: Tomasz Wojewodzic, University of Agriculture in Krakow, Institute of Economic and Social Sciences, Department of Agricultural Economic and Organization, Mickiewicza 21, 31-120 Kraków, Poland, e-mail: rrtwojew@cyf-kr.edu.pl

- a constant pressure to concentrate a volume of production factors and changes in their structure, forcing the implementation of cost strategies and at the same time the increase of effectiveness and competitiveness;
- social and economic changes of the functioning of production units in agriculture leading to the marginalization of natural and subsistence forms of the organization of production to the benefit of commodity farming, farmer agriculture and agribusiness.

Changes of the agrarian structure are unavoidable; however, given the conditions of the considerable fragmentation of the Polish agriculture it is important that the processes of limiting agricultural activities and closing farms should not be dominated by forced economic collapses without any alternatives. Transformation processes should be conducted in a planned manner, helping improve living conditions of village inhabitants. Only then they will become a decent basis for the permanent development of agriculture as an important sector of the Polish economy.

The intensification of the processes of limiting the production in the first decade of the 21st century by a numerous group of farms in Poland is favorable to increased interest in theories describing recessive behaviors of business entities, including the theory of divestments. The purpose of the paper is to identify changes occurring on farms in relation to the limitation of their production activities. Considerable attention was paid to changes affecting the scale and organization of livestock production in regard of which recessive phenomena have been particularly visible in recent years.

MATERIAL AND METHODS

Many years of observations of farms in the southern and eastern Poland contributed to adapting, for descriptive purpose, occurring processes as part of a concept of a divestment. More on the topic can be found in studies by: Lovejoy [1971], Boddewyn [1976], Osbert-Pociecha [1998] and Wojewodzic [2011], which is familiar in economics of enterprises and management theory processes. Divestments on farms should be interpreted as processes involving "planned and deliberate limitation of agricultural production and/or allocation of resources of a farmer's household to the farm's production activity that leads to the release of resources of land, labor and capital which may be utilized as part of a different agricultural or non-agricultural activity" [Wojewodzic 2010]. The divestments can be both related to resources (limiting the resources of land, labor and capital used for farming) and/or production (the extensification of production, resigning from selected production activities, limiting or discontinuing production). In extreme circumstances divestments may involve farm liquidation through tenancy, sale or acquisition by a more powerful entity in economic terms.

As part of the research conducted in 2011–2013 a few research methods were used simultaneously: studies of reference books and secondary materials, including mass statistics data: the Central Statistical Office (GUS), the Agency for Restructuring and Modernization of Agriculture (ARiMR) and the Farm Accountancy Data Network (FADN), interviews (175 farms) and participant observations (among farms with owners personally known to researchers). The interviews were conducted on farms of the

Małopolska and Pogórze macroregion (The Małopolskie, Podkarpackie, Śląskie and Świętokrzyskie Voivodeships)[1].

RESULTS AND DISCUSSION

Over a short period of time the scale and structure of production on commodity farms have been determined by two major factors: market demand and farm's resources. In the long run the importance of signals from the market was decisive. The process of withdrawing from certain production activities by farms may be either temporary or permanent in nature. If the changes are planned and permanent and are assumed to help improve the economic standing of a farming family, they can be classified as production divestments. The improvement of the economic situation of the farming family results from the improvement of the farm's financial performance or the increase of out-of-farm income. Hence the divestment's indirect purpose can be:

- resigning from an activity that generates a negative direct surplus, without engaging the released resources in a different activity;
- reallocating the resources within the farm (from an activity characterized by lower economic effectiveness to that of higher effectiveness);
- withdrawing the resources from production on a farm and engaging them outside the farm [Wojewodzic and Mikołajczyk 2011];
- resigning from agricultural activity and preparing the resources or the entire farm for the change in ownership (or winding-up).

The divestments can take the form of anticipatory measures which help improve the effectiveness of the operations of a business entity (anticipatory divestments) or can become indirect stages leading to its liquidation (palliative divestments). The former very frequently become a part of the repositioning or re-concentration process. As indicated by Decker and van der Valden [2006], repositioning involves the change of core activities, whereas re-concentration consists in resignation from peripheral activities to the benefit of core activities (Fig. 1).

Thanks to the production potential the Polish agriculture ranks in the lead among European countries. Poland (in 2010) is one of the greatest producers of rye (the 2nd position), oat (the 3rd position), apples (the 5th position), potatoes (the 7th position) and sugar beet (the 7th position) in the world. Despite a considerable regress as regards the stock of animals, it produces 1.3% of meat (the 15th position) and 2% of milk (the 12th position) in the world [GUS 2013]. In 2010 farms in Poland utilized more than 15 million ha of agricultural land and more than 4 million people were engaged in farming, including nearly 2.3 million employed solely or mainly in agriculture [GUS 2012]. Over the last decade structural transformations have been clearly visible in agriculture. On the one hand, the process of the withdrawal of owners of small- and medium-sized farms from agricultural activities has accelerated. On the other hand, the current form of the European Union's agricultural policy, including area payments, prevents the real transfer of land between

[1] Selection of the farms (sample of farms) was determined by the scope of the research and financial possibilities.

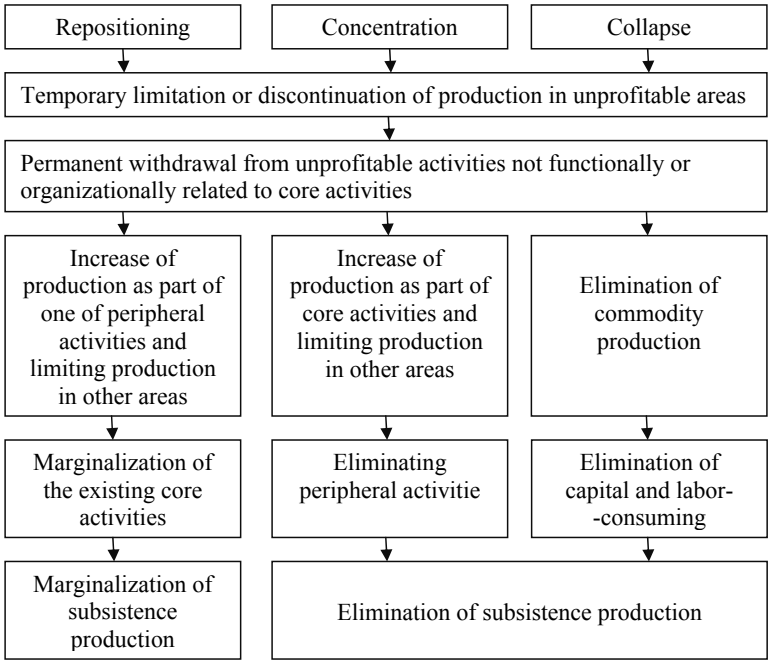

Fig. 1. Processes of eliminating production activities on a commodity farm
Source: Wojewodzic and Mikołajczyk 2011.

farms, contributing to the existence of informal sales of land in the form of rent-free lending for use or tenancy without a written agreement (area payments are frequently kept by the owner and the user does not have to pay the rent under tenancy). As a result the processes of concentrating the production occur faster than concentration of land. In 2002–2010 the number of farms in Poland dropped to 2.3 m (a decline by 22.4%). Additionally 17% of farms taking part in the agricultural census (2010) were not engaged in agricultural activities and 37.1% of farms were only engaged in plant production. Despite such changes, the average area of a farm engaged in agricultural activity is still very small, totaling nearly 8 ha of arable land.

The change of economic conditions of farming and enhanced sanitary conditions (along with milk production limits) contributed to the liquidation of small herds of animals to the greatest extent with regard to which the compliance with new requirements was frequently unreasonable in economic terms. Moreover, the phenomenon of dual-occupation of land owners common in regions with a fragmented agrarian structure made it more difficult to combine working on a farm with outside farm work. The 2010 agricultural census showed that from the perspective of the preceding eight years, the number of agricultural farms engaged in raising livestock decreased by 408 (28.1%). Share of 43.8% of farms keeping cattle resigned from raising it whereas 48.1% resigned from raising dairy cows. At the same time the concentration of milk production on larger farms occurred which strengthened the process of the increase of dairy cows' effectiveness.

The process of withdrawing from livestock production was also clearly noticeable in the case of other species. The number of farms keeping horses declined by 49.9% and the number of farms keeping sheep by 28.6%. Also in this case the decrease of the stock of farm animals occurred slower than the decline of the number of herds which implies the present process of production concentration [Wojewodzic 2011].

The processes of the withdrawal from livestock production by owners of farms are also noticeable in the group of commodity farms. The analysis of the production of farms functioning in the Polish FADN in 2004–2009 uninterruptedly showed that the group of farms keeping sheep declined by nearly 1/3. A higher percentage of farms resigning from a given activity was recorded only in the case of poultry – this activity was discontinued by 48% of farms. Milk production was discontinued by every sixth farm (17.3%) and swine was no longer raised by every fourth farm (24.4%). Due to resigning from keeping the livestock by subsequent farms, the share of farms without animal production in the surveyed sample rose from 13.7% in 2004 to 18.6% in 2009 [Wojewodzic and Mikołajczyk 2011].

Statistical data prevent the identification of reasons and consequences of production limitation processes. To evaluate the process, the interviews and participant observations were applied. The surveyed farms' structure area was dominated by entities of a small area, an average size of the farm totaled 6.9 ha, and only every sixth farm's area exceeded 10 ha of own land. Regarding the structure of the surveyed farms, typically of that area the largest group consisted of farms for which agricultural income is only a supplement to the incomes earned from other sources (Table 1).

The research showed that the processes of withdrawing from agricultural production in the surveyed population of farms intensified. The importance of incomes earned from agriculture continues to decline. In 2000 the incomes from agriculture were regarded as a major or only source of incomes by 44% of farms, however, in 2011 the above was true only with regard to 28% of farms. On farms which earned their incomes mostly from outside farm work, much fewer investments were made in tractors, agricultural machinery and buildings for agricultural production whereas the investments related to families' living conditions occurred more frequently (e.g. garages, shelters). In the entire surveyed population only two storage rooms, one barn, three warehouses and one drying room were erected. The investments related to agricultural activity mostly pertain to farms that see their future in agriculture and for whom incomes from agriculture constitute an important source of incomes.

Reasons for owners' declining interest in continuing to be engaged in agricultural activity can be mostly ascribed to economic and cultural factors which is also confirmed by respondents' opinions (respondents could indicate three most important reasons in his/her opinion): a low production profitability (71.2%), absence of successors (75%), difficulties with reconciling working in agriculture with employment outside a farm (30.4%).

The entities with non-agricultural sources of incomes withdraw from agricultural activities in the first place (Table 2) – for them work on a farm is very frequently an alternative cost to working outside the farm. More and more frequently the nature of work outside farms (seasonal work, work outside the place of residence etc.) conflicts with agricultural activities where individual works and procedures must be performer at an appropriate time of the day and year.

Table 1. Changes in the resources of means of production of the surveyed population of farms

Items	Households for which agriculture in 2000 accounted for				Total
	100%	50–99%	10–50%	<10%	
	of incomes				
The structure of surveyed farms (%)	22.3	21.7	40.0	16.0	100.0
An average area of own land on a farm in 2000 (ha)	8.7	8.1	6.0	4.7	6.9
The share of farms increasing the resources of own land after 2000 (%)	31.3	21.1	11.4	14.3	18.9
The share of farms decreasing the resources of own land after 2000 (%)	7..7	34.2	27.1	10.7	21.7
The share of farms engaged in construction investments[a] after 2000 (%)	12.8	18.4	7.1	32.1	14.9
The share of farms converting farm buildings for non-farm purposes after 2000 (%)	23.1	13.2	22.9	7.1	18.3
The share of farms converting farm buildings for farm purposes after 2000 (%)	33.3	18.4	8.6	0.0	15.4
The share of farms without a farm tractor in 2011 (%)	2.6	0.0	17.1	39.3	13.1
The share of farms with a farm tractor manufactured after 2000 (%)	38.5	31.6	11.4	3.6	20.6
The share of farms with machinery manufactured after 2000 (%)	66.7	47.4	25.7	21.4	38.9

[a]Excluding residential buildings.
Source: Own study.

Table 2. Changes in the production scale in 2000–2011

Item	Households for which agriculture in 2000 accounted for				Total
	100%	50–99%	10–50%	<10%	
	of incomes				
The share of farms without livestock production[a] in 2000 (%)	10.3	15.8	18.6	17.9	16.0
The share of farms performing anticipatory divestments as part of livestock production[b] (%)	41.0	23.7	12.9	0.0	19.4
The share of farms resigning from livestock production[c] after 2000 (%)	12.8	18.4	41.4	53.6	32.6
The share of farms resigning from agricultural production[d] after 2000 (%)	2.6	7.9	15.7	28.6	13.1

[a]The animal stock below 0.1 of livestock unit (LU); [b]liquidation of swine or cattle and increase of the stock in an alternative group; [c]resigning from livestock production or limiting livestock production below 0.1 of livestock unit (LU); [d]the crop area below 0.2 ha and livestock below 0.1 of livestock unit (LU).

Source: Own study.

A definite majority of respondents (about 80%) regarded the decision to discontinue agricultural activities as the right one, the others have difficulties with a clear evaluation of the circumstances. Major benefits which the respondents listed in relation to limiting agricultural production to plant production and complete resignation from agricultural activities included:

- more time for other ventures (leisure time, for families, for work outside farms);
- the improved looks of the environment, getting rid of unpleasant smells;
- improved material conditions in relation to the reallocation of labor force resources;
- reduced emotional (stress) and physical effort (improved health);
- increased mobility, the possibility of going away on a holiday or to work abroad;
- better life quality.

Sporadically elements were indicated which the respondents regretted such as:

- wasting accomplishments of many generations working hard on a farm;
- abandoning family traditions;
- the loss of opportunities for earning an additional income and area payments;
- limited access to own healthy food and necessity of shopping for food of unknown origin.

Anticipatory divestments with regard to livestock production should be regarded as a symptom of production specialization, therefore, they mostly relate to farms which see their future in continuing agricultural production. The main reasons for resigning from raising cattle or swine included: the reallocation of resources from a less profitable activity to a more profitable one, improving work organization, the necessity of complying with sanitary requirements in the area of the production in progress.

CONCLUSIONS

Farmers' abandonment of livestock production can be both a transitional stage of resigning from agricultural activities (palliative divestments) as well an initial stage for the farm's re-organization (repositioning, re-concentration). The research conducted shows great intensification of the processes of owners of land in Poland abandoning agricultural activities in the first decade of the 21st century. The above-mentioned phenomenon is supported by both mass statistics data (GUS) and the presented research results.

The phenomenon characteristic of a major portion of farms is withdrawing from raising animals. The main reasons behind such divestments performed by farmers are undoubtedly economic factors resulting from deteriorating production profitability, especially with regard to the production in small herds. Also labor consumption and the necessity of daily provision of such work as part of the production play an important role as they make it difficult to work outside the farms. There are reasons based on which it could be said that the scale of the phenomenon of the withdrawal from agricultural activities by land owners, including raising livestock, could be higher had it not been for area payments, farm families' attachment to tradition and healthy food.

ACKNOWLEDGEMENT

Paper was prepared as a part of the project entitled *Divestments on farms – essence, scope, consequences* issue 3913/B/H03/2011/40, financed by the National Science Center of Poland.

REFERENCES

Boddewyn, J.J. (1976). International Divestment. A Survey of Corporate Experience. Business International of Corporate Experience, New York.

Decker, C., van der Velden, R. (2006). Desinvestition von Unternehmensteilen aus der Sicht des Ressourcen- und Kompetenzansatzes. Neue Perspektiven des Strategischen Kompetenz-managements. Hrsg. C. Burmann, J. Freiling, M. Hülsmann Wiesbaden, 221–242.

Estey, J.A. (1959). Cycles economic. PWG, Warszawa.

Gołaś, Z., Kozera, M. 2003. Economic and social conditions of changes of income structure of individual farms. Annals of the Poznań University of Life Sciences, 358.

Lovejoy, F.A. (1971). Divestment for Profit. Financial Executives Research Foundation, New York.

Osbert-Pociecha, G. (1998). Dywestycje w przedsiębiorstwie (Divestments in the enterprise). Prace Naukowe AE we Wrocławiu, 794.

Płonka, A., Musiał, W. (2012). Reakcje dostosowawcze gospodarstw drobnotowarowych w okresie dekoniunktury gospodarczej na przykładzie woj. Małopolskiego (Streamlining small farm operations towards the economic changes on example of Małopolska region). Roczniki Naukowe SERiA, 14, 8, 292–296.

Snowdon, B. (1998). Współczesne nurty teorii makroekonomii (Modern trends in macroeconomic theory). PWN Warszawa.

Central Statistical Office – GUS (2013). Agriculture Statistical Annals 2011. Warszawa.

Central Statistical Office – GUS, (2012). Report on results. The 2010 common agricultural census. Warszawa.

Wojewodzic, T. (2010). Divestments on farms – essence, definitions, division. Wieś i Rolnictwo, 147 (2).

Wojewodzic, T. (2011). Processes of concentration and atomization of livestock production in the Małopolska and Pogórze Region. In Small commodity farms before a new planning and settlement period in the European Union – 2011–2014 Multi-year Program series. IERiGŻ-PIB,Warszawa.

Wojewodzic, T., Mikołajczyk, J. (2011). Production divestments on commodity farms. Zagadnienia Ekonomiki Rolnej, 4.

DYWESTYCJE PRODUKCYJNE W GOSPODARSTWACH ROLNICZYCH – ISTOTA, ZAKRES, KONSEKWENCJE

Streszczenie. Celem opracowania jest identyfikacja zmian zachodzących w gospodarstwach rolniczych w związku z ograniczaniem ich aktywności produkcyjnej. Dużą uwagę poświęcono zmianom w skali i organizacji produkcji zwierzęcej, w której zjawiska recesywne są w ostatnich latach szczególnie widoczne. Obserwowane na początku XXI wieku procesy wycofywania się rolników w Polsce z produkcji rolniczej należy uznać za przejaw zmian strukturalnych w rolnictwie. Odchodzenie rolników od prowadzenia produkcji zwierzęcej może być zarówno etapem pośrednim rezygnacji z działalności rolniczej (dywestycji paliatywnych), jak również etapem wstępnym reorganizacji gospodarstwa (repozycjonowanie, rekoncentracja).

Słowa kluczowe: dywestycje, gospodarstwo rolnicze, upadek ekonomiczny

Accepted for print: 17.11.2015

For citation: Wojewodzic T., Płonka A. (2015). Production divestments on farms – essence, scope, consequences. Acta Sci. Pol., Oeconomia, 14 (4), 139–147.

ISSN 1644-0757
eISSN 2450-4602
http://acta_oeconomia.sggw.pl

ACTA SCIENTIARUM POLONORUM *Oeconomia 14 (4) 2015, 149–157*

THE SIGNIFICANCE OF EDUCATION IN PROMOTING THE IDEA OF SUSTAINABLE DEVELOPMENT AND SOCIAL RESPONSIBILITY IN AGRICULTURE IN THE POMERANIAN VOIVODESHIP

Dagmara K. Zuzek
University of Agriculture in Kraków

Izabela Wielewska
University of Technology and Life Sciences in Bydgoszcz

Abstract. At present, agricultural production is required not only to meet goals related to producing food, but also to observing the laws of environmental protection. Farmers should be aware that agricultural production is part of the environment and farming cannot destroy the natural world. Therefore, it becomes necessary to implement the principles of sustainable development and social responsibility in agriculture through developing the environmental awareness of farmers. The aim of the study was to identify and evaluate the significance of education for sustainable development and social responsibility in agriculture in the opinion of farmers themselves. The poll included 386 respondents from the Pomeranian Voivodeship. The study showed that farmers are not particularly interested in the problems of sustainable development and social responsibility in agriculture, and they have little knowledge about the subject, which means that there is an urgent need for a constant transfer of knowledge to farmers, with the most significant role played by school education as well as training and workshops ran by Agricultural Advisory Centres.

Key words: education, corporate social responsibility, sustainable development

Corresponding author: Dagmara K. Zuzek, University of Agriculture in Krakow, Faculty of Agriculture and Economics, Mickiewicza 21, 31-120 Kraków, Poland, e-mail: dagzuz@gmail.com

INTRODUCTION

For the last several years, there has been a noticeable increase of interest in management based not only on achieving profits and effectiveness, but also broadly defined social and environmental interests. This stems from increasingly larger awareness of businesses about the significance of the principles of sustainable development and from the common belief that taking voluntary initiative with regard to corporate social responsibility can contribute to a better attractiveness and credibility of companies on the national and international markets, where good business practices are highly valued.

Responsible business is a new approach to conducting business where it is not only money that counts, but also the company's activities for the benefit of the environment, which are difficult to appraise [Zuzek 2012].

The aim of this study was to identify the significance of education for sustainable development and social responsibility in agriculture in the opinions of farmers from the Pomeranian Voivodeship, whose dominant economic activity was conventional farming. The questionnaire included closed and semi-open questions. 500 questionnaires were sent out, with 386 respondents from 19 *powiat* (counties) of the analysed Voivodeship sending in their responses before the deadline set by the authors. This means that on average questionnaires from 20 farmers from each *powiat* were received. The obtained data underwent a statistical analysis. A Microsoft Excel spreadsheet was used to prepare the calculations.

SUSTAINABLE DEVELOPMENT AND CORPORATE SOCIAL RESPONSIBILITY

Sustainable development stainable development, although a widely used phrase and idea, has many different meanings and therefore provokes many different responses. In broad terms, the concept of sustainable development is an attempt to combine growing concerns about a range of environmental issues with socio-economic issues [Hopwood et al. 2005]. A similar point of view have or Giddings et al. [2002] or Dobson [2007].

Due to the diversity and multitude of factors which impact the natural environment, three important areas have been identified which should be focused on in order to achieve sustainable development. The first area is environmental protection and rational management of natural resources (such as protection of endangered species of animals and plants; limiting environmental pollution; promoting renewable energy sources). The second area is economic growth and the resultant fair division of profits (changing irrational consumption and production models, financing development; facilitating access to markets, etc.). The third area concerns social development (health protection, combating poverty, access to education, environmental education) [Kozłowski 2002]. Socio-economic development cannot be separated from the natural environment, and ecological (environmental) education should play a key role along with modifying the dominant system of values: changing people's way of thinking from the point of view of conqueror to the position of a partner of the natural environment [Pawul and Sobczyk 2011].

The concept of sustainable development is in accordance with the model of corporate social responsibility (CSR), which is defined as an obligation to conduct business activity in an ethical and transparent way in accordance with the principles of sustainable development, according to the law and norms of behaviours, and consequently striving for social welfare taking into consideration the expectations of the stakeholders [Adamczyk 2009]. More broadly, social responsibility is "an organisation's responsibility for the impact of its decisions and actions on the environment and society, through transparent and ethical behaviours, which contributes to sustainable development, health, and social welfare; takes into consideration the expectations of the stakeholders; is in accordance with the applicable law and consistent with international behaviours; is implemented in the entire organisation, and practiced in its activities within its sphere of influence" [Olejniczak 2013]. The concept of CSR therefore means both complying with work standards, environmental protection, obeying the principles of human rights, counteracting corruption, as well as voluntary socially useful activities [Chlebicka 2010].

The high ranking of corporate social responsibility (CSR) on research agendas [Maignan and Ralston 2002, Greenfield 2004, Pearce and Doh 2005, McWilliams et al. 2006] appears to be reflected in theoretical and managerial discussions. Model of CSR can also be defined as an effective process of management which contributes to an increased competitiveness of the company by responding to the expectations of the stakeholders of the company (farm) while ensuring the sustainable development of the company. It is essential that the two overlapping conceptions (of sustainable development and of corporate social responsibility) should be implemented in practice. However, a low level of awareness of the interrelations between economy, society, and the environment is the basic obstacle to sustainable development [Klamecka-Roszkowska and Muczyński 2011].

Education plays a key role with regard to removing gaps in the environmental awareness and social responsibility in agriculture of inhabitants of rural areas. Environmental education should be of particular concern in the implementation of the state's environmental policy [Sobczyk 2007]. One of the main assumptions of the new directions of this policy is departure from a traditional, narrowly defined environmental protection towards sustainable development, i.e. subordinating the needs and aspirations of the society and state to the possibilities offered by the environment at our disposal [Alberski et al. 2002]. The framework of this policy assumes that respecting the principle of sustainable development is of primary importance, which means far-sighted management of natural resources due to their limited nature, harmonising economic, social, and environmental development goals, a long-term approach to analysing, planning, and implementing development objectives and wide-scale environmental education [Lorens 2003].

In order to effectively develop education for sustainable development and social responsibility in agriculture, all available educational means, both public and private, should be fully taken advantage of, such as: school systems, non-school education, agricultural and environmental counselling, and other forms of multilateral information transfer. The basic objectives of education in this regard should include:

- building the sense of responsibility for natural goods, developing environmentally friendly behaviours;
- teaching the basics of a sustainable use of the natural environment and ways of its protection;
- building the ability to see a connection between the state of the environment and agricultural activity, the quality of an individual's and an entire society's life, preparing for interdisciplinary thinking;
- implementing the need to observe the norms and bans in the behaviour of both individuals and social groups, as well as whole communities significant from the point of view of environmental protection, and opposing behaviours which threaten nature;
- building the ability to cultivate crops and farm animals while using natural resources sparingly and protecting them as much as possible;
- building an attitude of international solidarity with regard to environmental protection in rural areas [Domka 2001].

The specificity of education for sustainable development and social responsibility in agriculture can be characterised by several factors: transfer of knowledge and skills, inseparability of implemented objectives, integration, complementary contents. This education should impact farmers' awareness with regard to environmental protection and create a dynamic structure of three interrelated and mutually conditioning elements:

- knowledge about man's (society's) impact on the natural world and interdependencies in ecosystems;
- rules, norms of behaviour, system of values;
- the ability to predict environmental consequences of the undertaken actions [Domka 2001].

These actions are all highly useful, necessary, and beneficial in the policy of sustainable development and social responsibility in agriculture.

STUDY RESULTS

The idea of sustainable development, which constitutes a system of values and political conceptions facilitating harmonious socio-economic growth that take into consideration the protection of natural resources, requires promoting knowledge about the environment as well as developing sensitivity to environmental reality and modelling attitudes that protect it.

A tool for implementing the above tasks is broadly defined environmental education, which leads to an increased environmental awareness and developing correct behaviours between man and the environment, and thus strengthens the hope that the biodiversity of life on Earth can be preserved [Wiąckowski 2001].

In the opinion of 33.2% of the respondents, the knowledge of the principles of sustainable development and social responsibility in agriculture is definitely poor, and according to 42.2% it is rather poor. Only 7.8% of farmers stated that they have definitely good knowledge of sustainable development and social responsibility in agriculture, and 15.3% of the respondents admitted that they had rather good knowledge of the subject matter (Table 1).

Table 1. Knowledge of the principles of sustainable development and social responsibility in agriculture in the opinion of the respondents

Specification	Number	%
Definitely good knowledge	30	7.8
Rather good knowledge	59	15.3
Difficult to say	6	1.5
Rather poor knowledge	163	42.2
Definitely poor knowledge	128	33.2
Total	386	100.0

Source: Own research.

Farmers, especially older ones, did not tend to show high interest in the problems of sustainable development. Almost 60% of the respondents admitted that their interest in the idea is rather low, and almost 20% stated that it was definitely low. Some farmers (16.9%) stated that they were interested in the subject matter. Share of 5.4% of the respondents did not choose a specific response (Table 2).

Table 2. Interest in farmers' knowledge about sustainable development and social responsibility for agriculture

Specification	Number	%
Definitely high interest	23	6.0
Rather high interest	42	10.9
Difficult to say	21	5.4
Rather low interest	223	57.8
Definitely low interest	77	19.9
Total	386	100.0

Source: Own research.

The need to transfer knowledge about sustainable development and social responsibility in agriculture to farmers is noticed increasingly more. This is also confirmed by the study. According to the respondents, the demand is definitely high (54.7%) or rather high (28.5%). 7.8% of the polled farmers stated that it was rather low, and 9% did not have an opinion on the matter (Table 3).

Aiming to introduce the farmer to the principles of sustainable development and social responsibility for agriculture, education should:

- develop a responsible attitude to the problems of life and work in rural areas, conditioned by a solid knowledge based on respect for nature and its inalienable rights;
- make changes in the system of farmers' values contributing to respect for nature and responsibility for the environment;
- develop and strengthen motivation for cultivating plants and farming animals in accordance with the model of social responsibility.

Table 3. The need for knowledge transfer to farmers about sustainable development and social responsibility in agriculture

Specification	Number	%
Definitely high demand	211	54.7
Rather high demand	110	28.5
Difficult to say	35	9.0
Rather low demand	30	7.8
Definitely low demand	–	–
Total	386	100.0

Source: Own research.

What is also needed is providing farmers with a system of knowledge about the causes and effects of cultivating land, and teaching them to respect the natural environment and cultivating crops and farming animals in a sensible way. The most beneficial methods of education concerning sustainable development and social responsibility in agriculture are highly diverse. First of all, it should be provided by schools; this was the opinion of 91% of the respondents. The respondents also consider the work of advisors as a good method of education, since advisory services are one of the most beneficial methods of teaching sustainable development and social responsibility in agriculture, as confirmed by 88.6% of the respondents. The respondents also considered workshops and trainings as a good method of knowledge transfer (almost 68%). Additionally, what is important for acquiring knowledge about sustainable development and social responsibility in agriculture is non-school education (58.5%) and brochures and informational materials (53.9%), which farmers can read at home (Table 4).

Table 4. The most advantageous methods of education about sustainable development and social responsibility in agriculture

Specification	Number	%
School education	351	91.0
Non-school education	226	58.5
Mass-media (press, radio, TV, the Internet)	178	46.1
Advisory (agriculture and environment advisors)	342	88.6
Workshops, trainings	261	67.6
Brochures, leaflets, etc.	208	53.9

Source: Own research.

Education for sustainable development and social responsibility in agriculture should lead not only to the development of a clear system of knowledge, but also some values which the farmer will apply in cultivating crops and farming animals (Table 5).

Table 5. The importance of education about sustainable development and social responsibility in agriculture for farmers, in the farmers' opinion

Specification	Number	%
Definitely high	196	50.8
Rather high	169	43.8
Difficult to say	21	5.4
Rather low	–	–
Definitely low	–	–
Total	386	100.0

Source: Own research.

For this reason, the respondents considered the significance of education concerning sustainable development and social responsibility in agriculture to be definitely high (50.8%) and rather high (43.8%).

The result of introducing these educational measures should be the education (through the process of building environmental awareness) of a generation of farmers who will manage their farms in accordance with the principles of sustainable development and social responsibility in agriculture.

CONCLUSIONS

Dangers to the environment are usually unintentional, side-effect of human activity, including agricultural activity. Management harmful to the natural environment led to the necessity to implement the principles of sustainable development and social responsibility. The following conclusions have been drawn from the study:

1. The polled farmers admitted that their knowledge of and interest in the problems of sustainable development and social responsibility in agriculture is not considerable and that a constant transfer of knowledge to this group of producers is needed.
2. In order to effectively develop education for sustainable development and social responsibility in agriculture all educational methods, both public and private, should be used. The polled farmers considered school education and trainings and workshops ran by Agricultural Advisory Centres to be the most important.
3. The significance of education concerning sustainable development and social responsibility in agriculture should be regarded as high, since it helps to shape a system of farmers' knowledge about the functioning of nature, interdependencies between the natural world and civilisation, and a sense of responsibility for the environment.

REFERENCES

Adamczyk, J. (2009). Społeczna odpowiedzialność przedsiębiorstw. Teoria i praktyka. Wyd. Naukowe PWE, Warszawa.

Alberski, R., Lisicka, H., Sommer, J. (2002). Polityka ochrony środowiska. Wyd. Uniwersytetu Wrocławskiego, Wrocław.

Chlebicka, A. (2010). Koncepcja społecznej odpowiedzialności; wkład do debaty nad przyszłością Wspólnej Polityki Rolnej. Problemy Rolnictwa Światowego, 10, 4, 5–11.

Dobson, A. (2007). Environmental citizenship: towards sustainable development. Sustainable Development, 15 (5), 276–285.

Domka, L. (2001). Dialog z przyrodą w edukacji dla ekorozwoju. Wyd. Naukowe PWN, Warszawa-Poznań.

Giddings, B., Hopwood, B., O'Brien, G. (2002). Environment, economy and society: fitting them together into sustainable development. Sustainable Development, 10 (4), 187–196.

Greenfield, W.M. (2004). In the name of corporate social responsibility. Business Horizons, 47, 19–28.

Hopwood, B., Mellor, M., O'Brien, G. (2005). Sustainable development: mapping different approaches. Sustainable Development, 13 (1), 38–52.

Klamecka-Roszkowska. G., Muczyński. M. (2011). Społeczna odpowiedzialność jako atrybut współczesnego przedsiębiorstwa, „Equilibrium" Zeszyty Naukowe Wyższej Szkoły Ekonomicznej w Białymstoku, Białystok, 2, 103–132.

Kozłowski, S. (2002). Ekorozwój. Wyzwanie XXI wieku. Wyd. Naukowe PWN, Warszawa.

Lorens, P. (2003). Zrównoważony rozwój, a polityka przestrzenna. [In:] T. Borys (Ed.). Zarządzanie zrównoważonym rozwojem. Agenda 21 w Polsce – 10 lat po Rio. Wyd. Ekonomia i Środowisko, Białystok, 130–152.

McWilliams, A., Siegel, D.S., Wright, P.M. (2006). Corporate social responsibility: strategic implications. Journal of Management Studies, 43, 1–18.

Maignan, I., Ralston, D. (2002). Corporate social responsibility in Europe and the U.S.: insights from businesses'self-presentations. Journal of International Business Studies, 33, 497––514

Olejniczak, K. (2013). Wpływ wybranych czynników ekologicznego aspektu CSR na przewagę konkurencyjną przedsiębiorstw działających na terenie województwa śląskiego. Rocznik Ochrona Środowiska, 15, 2840–2849.

Pearce, J.A., Doh, J.P. (2005). High-impact collaborative social initiatives. MIT Sloan Management Review, 46, 30–39.

Pawul, M., Sobczyk, W. (2011). Edukacja ekologiczna w zakresie gospodarki odpadami jako narzędzie realizacji zrównoważonego rozwoju. Problems of Sustainable Development, 6, 1, 147–156.

Sobczyk, W. (2007). Jakość środowiska a ekologia socjalna w opinii studiującej młodzieży ze środowisk wiejskich. Ochrona Środowiska i Zasobów Naturalnych, 33, 156–161.

Wiąckowski, S.K. (2001). Zagrożenia XXI wieku wyzwaniem dla edukacji ekologicznej. [In:] J. Dębowski (Ed.). Edukacja ekologiczna wobec wyzwań XXI wieku. Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego, Olsztyn, 132.

Zuzek, D. (2012). Koncepcja społecznej odpowiedzialności biznesu szansą konkurencyjności małych i średnich przedsiębiorstw, Handel Wewnętrzny, Instytut Badań Rynku, Konsumpcji i Koniunktur, 1, 298–307.

ZNACZENIE EDUKACJI W PROPAGOWANIU IDEI ZRÓWNOWAŻONEGO ROZWOJU I SPOŁECZNEJ ODPOWIEDZIALNOŚCI ROLNICTWA W WOJEWÓDZTWIE POMORSKIM

Streszczenie. Obecnie od produkcji rolniczej wymaga się realizacji nie tylko celów związanych z wytwarzaniem żywności, ale także przestrzegania praw ochrony środowiska naturalnego. Rolnicy powinni zdawać sobie sprawę z tego, że jest częścią tego środowiska a praca na roli nie może niszczyć przyrody, dlatego niezbędne staje się wdrażanie zasad zrównoważonego rozwoju oraz społecznej odpowiedzialności w rolnictwie poprzez kształtowanie świadomości ekologicznej rolników. Celem badań było wskazanie i ocena znaczenia edukacji na rzecz zrównoważonego rozwoju i społecznej odpowiedzialności rolnictwa w opinii samych rolników. Badaniu sondażowemu poddano 386 respondentów z województwa pomorskiego. Badania wykazały, że rolnicy nie są specjalnie zainteresowani problematyką zrównoważonego rozwoju i społecznej odpowiedzialności wobec rolnictwa, ich wiedza w tym zakresie jest niewielka, stąd też istnieje pilna potrzeba ciągłego transferu wiedzy do rolników, a najbardziej znaczącą jest edukacja szkolna oraz prowadzone przez Ośrodki Doradztwa Rolniczego szkolenia i warsztaty.

Słowa kluczowe: edukacja, społeczna odpowiedzialność, zrównoważony rozwój

Accepted for print: 17.11.2015

For citation: Zuzek D.K., Wielewska I. (2015). The significance of education in promoting the idea of sustainable development and social responsibility in agriculture in the Pomeranian Voivodeship. Acta Sci. Pol., Oeconomia, 14 (4), 149–157.

CONTENTS
SPIS TREŚCI

WSKAZÓWKI DLA AUTORÓW

Na łamach *Acta Scientiarum Polonorum* zamieszczane są oryginalne prace naukowe. Wszystkie prace są recenzowane przez specjalistów spoza jednostki macierzystej autorów z zachowaniem zasady wzajemnej anonimowości, tzw. double-blind review process. Prace proponowane do druku w poszczególnych seriach należy przesyłać na adres odpowiednich wydawnictw uczelnianych lub na adresy ze stron internetowych poszczególnych serii.

Wymogi ogólne i techniczne przygotowania prac:

1. **Objętość pracy** wraz z tabelami, rysunkami i fotografiami nie powinna przekraczać 12 stron formatu A-4.
2. **Materiały do publikacji** w *Acta Sci. Pol.* powinny być przygotowane zgodnie z zasadami procesu wydawniczego obowiązującego w redakcji danej serii.
3. **Styl dokumentów** – tekst pracy należy pisać czcionką typu TNR 12 pkt, 1 1/2 odstępu między wierszami, dopuszcza się stosowanie wyróżnień w tekście, np. kursywę i pogrubienie tekstu, ale bez podkreślania liter, wyrazów i zdań.
4. **Wielkość tabel i rysunków** nie może przekraczać formatu B-5 (12,5 × 19,5 cm); rozszerzenie tabel – doc. lub rtf.

Obowiązuje następujący układ pracy:

1. **Tytuł artykułu** w języku polskim (lub angielskim, jeżeli cała praca jest w języku angielskim; to samo dotyczy streszczenia i słów kluczowych).
2. **Imię i nazwisko** autora (-ów).
3. **Afiliacja** wszystkich autorów.
4. **Streszczenie strukturalne** pracy (600–1000 znaków).
5. **Słowa kluczowe** – do 6 słów pomocnych przy indeksacji i wyszukiwaniu, układ (od ogólnych do szczegółowych).
6. **Tekst główny** pracy naukowej powinien obejmować: wstęp z celami i hipotezami badawczymi, materiał i metody, wyniki, dyskusję, wnioski (lub podsumowanie) i piśmiennictwo.
7. **Tytuł, abstract** (600–1000 znaków) jako tłumaczenie streszczenia i słowa kluczowe w języku angielskim (lub polskim, jeśli cała praca jest w języku angielskim).
8. **Adres do korespondencji** – pocztowy i internetowy.

Tytuły tabel oraz ich treść, a także podpisy rysunków i legendy muszą być podane w języku polskim i angielskim, a numery tabel i rysunków – cyframi arabskimi.

Jednostki i pisownia – obowiązuje międzynarodowy układ SI, a jednostki powinny być zapisane np: $g \cdot dm^{-3}$ (a nie g/dm^3).

Piśmiennictwo – przy powoływaniu się w tekście pracy na publikacje innych autorów podajemy w nawiasie nazwisko i rok, w układzie chronologicznym [Kowalski i Lewandowski 2000, Lewandowski 2001, Zalewski i in. 2001] lub ...zdaniem Kowalskiego [2000].

Wykaz piśmiennictwa należy zestawić w porządku alfabetycznym. Gdy w danym roku jest wydanych więcej prac tego samego autora, po roku należy oznaczyć poszczególne pozycje a, b, c itd., np.:

Chełkowski, Z. (1966). Introdukcja troci do rzeki Gowienicy. Gosp. Ryb., 1(2), 18–19.

Greń, J., Kowalski, Z. (1972). Statystyka matematyczna. PWN, Warszawa.

Pisulewski, P., Strzetelski, J., Antoniewicz, A. (2009). Podstawowe założenia IZ PIB-INRA norm żywienia przeżuwaczy. [W:] J. Strzetelski (red.), IZ PIB-INRA. Normy żywienia przeżuwaczy. Wartość pokarmowa francuskich i krajowych pasz dla przeżuwaczy. Wyd. IZ PIB, Kraków, 11–20.

Patkowska, E., Konopiński, M. (2008a). Pathogenicity of selected soil-borne microorganisms for scorzonera seedlings (*Scorzonera hispanica* L.). Folia Horticul., 20(1), 31–42.

Patkowska, E., Konopiński, M. (2008b). Pathogenicity of selected soil-borne fungi for seedlings of root chicory (*Cichorium intybus* L. var. *sativum* Bisch.). Veg. Crops Res. Bull., 69, 81–92.

Turski, W. (1972). Projektowanie oprogramowania systemów liczących. Mat. konf. Projektowanie maszyn i systemów cyfrowych. Warszawa 2–5 czerwca 1971. PWN, Warszawa, 132–139.

Autor przesyła do redakcji tekst pracy w 2 egzemplarzach. Po otrzymaniu recenzji Autor przesyła do redakcji egzemplarz redakcyjny z uwagami recenzenta, poprawiony egzemplarz pracy wraz z nośnikiem elektronicznym (dyskietka, CD lub e-mail) i ustosunkowaniem się do uwag recenzenta i redaktora. Część główną publikacji (streszczenie, właściwy tekst artykułu oraz piśmiennictwo) należy zapisać w jednym pliku. Tabele, rysunki i inne załączniki winny być włączone do tego pliku i dodatkowo znaleźć się w oddzielnych plikach. Redakcja zastrzega sobie prawo dokonywania skrótów i poprawek, a także proponowania zmian i uzupełnień merytorycznych uzgodnionych z autorem. Materiał graficzny (rysunki, schematy, wykresy) powinien być opracowany i przysłany jako osobny zapis elektroniczny (pliki źródłowe) w programach pracujących w środowisku Windows (np. w programach Excel, Corel Draw, Photoshop itp.).

Autor publikowanej pracy zobowiązany jest przenieść swe prawa autorskie na wydawcę i złożyć oświadczenie, że praca nie była publikowana w innym czasopiśmie **Autorzy prac partycypują w kosztach ich wydania**. Informacja o opłatach i dodatkowe informacje dla autorów znajdują się na stronach internetowych

www.acta.media.pl; acta_oeconomia.sggw.pl

INSTRUCTIONS TO AUTHORS

The journal *Acta Scientiarum Polonorum Oeconomia* features original scientific articles related to all aspects of economy, for example: food economy, European consumer goods market, sustainable regional development, development of culture environment, post crises political and social processes, human and social capital, labour market – gender perspective, public finances, rural development and entrepreneurship, social and innovative entrepreneurship, tourist economy.

General and technical requirements for the elaboration of papers:

1. **Size of the research paper** including tables, figures and photographs should not exceed 12 pages of A-4 format.
2. **Materials to be published** in *Acta Sci. Pol.* should be prepared in accordance with the rules of the publishing process binding at the publishing office of a given series of the Journal.
3. **Style of documents** – the text of the paper should be typed with TNR font 12 points, 1 1/2 of space between the lines, setting parts of the text in special typeface is allowed, e.g. italic or bold, but without underlining letters, words and sentences.
4. **Size of tables and figures** cannot exceed B-5 format (12.5 × 19.5 cm); descriptions of tables should be typed with TNR font 9 points, content of tables 8 points, single space, if possible without vertical lines, table format – doc. or rtf.

The following paper setting is binding:

1. **Title of the article** in Polish (or in English if the whole paper is in English; the same refers to the summary and key words).
2. **First name and surname** of the author (-s).
3. **Afiliation**.
4. **Paper abstract** (600–1000 characters).
5. **Key words** – up to 6 words useful when indexing and searching, from general to detail.
6. **The main text** of the research paper should include: introduction with the aim and research hypothesis, material and methods, results, discussion, conclusions (or summary) and references.
7. **Title, abstract** (600–1000 characters) as a translation of the summary and **key words** in English.
8. **Address** of the author's (authors') place of work – post and e-mail address.

Titles of tables and their content, and captions of figures and legends must be provided in English, while the numbers of tables and figures – with Arabic numerals.

Units and spelling – the international SI system is binding, e.g. $g \cdot dm^{-3}$ (and not g/dm^3).

References – when referring to the publications of other authors in the text of the paper, a surname and a year should be provided in brackets [Kowalski and Lewandowski 2000, Lewandowski 2001, Zalewski et al. 2001] or …according to Kowalski [2000]...

The list of references should be presented in the alphabetical order in the following way: author's (authors') surname, initials of first names; year of publishing if there is more than one paper of the same author published in a given year, after the year it is necessary to mark particular items a, b, c etc.; title of the paper, bibliographical abbreviation of the publishing house and place of publishing, numbers of volume, issue of periodic, book series, and pages, e.g.:

Chełkowski, Z. (1966). Introdukcja troci do rzeki Gowienicy. (Introduction of brown trout into the Gowienica river). Gosp. Ryb., 1(2), 18–19.

Greń, J., Kowalski, Z. (1972). Statystyka matematyczna. (Matematical statistics). PWN, Warszawa.

Pisulewski, P., Strzetelski, J., Antoniewicz, A. (2009). Podstawowe założenia IZ PIB-INRA norm żywienia przeżuwaczy (Basic objectives of nutritional standards for ruminants of the IZ PIB-INRA). [In:] J. Strzetelski (Ed.), IZ PIB-INRA. Normy żywienia przeżuwaczy. Wartość pokarmowa francuskich i krajowych pasz dla przeżuwaczy. Wyd. IZ PIB, Kraków, 11–20.

Patkowska, E., Konopiński, M. (2008a). Pathogenicity of selected soil-borne microorganisms for scorzonera seedlings (*Scorzonera hispanica* L.). Folia Horticul., 20(1), 31–42.

Patkowska, E., Konopiński, M. (2008b). Pathogenicity of selected soil-borne fungi for seedlings of root chicory (*Cichorium intybus* L. var. *sativum* Bisch.). Veg. Crops Res. Bull., 69, 81–92.

Turski, W. (1972). Projektowanie oprogramowania systemów liczących. (Software design of computing systems). Mat. konf. Projektowanie maszyn i systemów cyfrowych. Warszawa 2–5 czerwca 1971. PWN, Warszawa, 132–139.

The author sends the text of the paper in 2 copies to the editorial office. After he/she receives a review, the author sends an editorial copy to the editorial office including the reviewer's comments, a corrected copy of the paper including an electronic carrier (diskette, CD or e-mail) and a response to the reviewer's and editor's comments. The main part of the publication (abstract, the text of the article proper and references) should be saved in one file. The editorial office reserves a right to make cuts and corrections, and to suggest changes and substantive supplementations agreed with the author. The graphic material (figures, diagrams, charts) should be prepared and sent as a separate electronic file (source files) made in programs working in Windows environment (e.g. in Excel, Corel Draw, Photoshop etc.).

The author of the paper published is obliged to transfer his/her copyright to the publisher and submit a declaration that the paper has not been published in another journal.

The authors of the papers participate in the costs of their publishing. Information about fees and additional information for authors are available at the websites

www.acta.media.pl; acta_oeconomia.sggw.pl

Acta Scientiarum Polonorum – ogólnopolskie czasopismo naukowe polskich uczelni rolniczych, publikuje oryginalne prace w następujących seriach tematycznych:

Agricultura – Agronomia
Wydawnictwa Uczelniane Uniwersytetu Technologiczno-Przyrodniczego w Bydgoszczy
ul. Ks. A. Kordeckiego 20, 85-225 Bydgoszcz, tel. 52 374 94 36, fax 52 374 94 27

Biologia – Biologia
Wydawnictwo Uniwersytetu Przyrodniczo-Humanistycznego w Siedlcach
ul. Bema 1, 08-110 Siedlce, tel. 25 643 15 20

Biotechnologia – Biotechnologia
Geodesia et Descriptio Terrarum – Geodezja i Kartografia
Medicina Veterinaria – Weterynaria
Wydawnictwo Uniwersytetu Przyrodniczego we Wrocławiu
ul. Sopocka 23, 50-344 Wrocław, tel./fax 71 328 12 77

Technica Agraria – Inżynieria Rolnicza
Hortorum Cultus – Ogrodnictwo
Wydawnictwo Uniwersytetu Przyrodniczego w Lublinie
ul. Akademicka 13, 20-033 Lublin, tel. 81 445 67 11, fax 81 533 37 52

Piscaria – Rybactwo
Zootechnica – Zootechnika
Wydawnictwo Uczelniane Zachodniopomorskiego Uniwersytetu Technologicznego w Szczecinie
al. Piastów 50, 70-311 Szczecin, tel. 91 449 40 90, 91 449 41 39

Silvarum Colendarum Ratio et Industria Lignaria – Leśnictwo i Drzewnictwo
Technologia Alimentaria – Technologia Żywności i Żywienia
Wydawnictwo Uniwersytetu Przyrodniczego w Poznaniu
ul. Witosa 45, 61-693 Poznań, tel. 61 848 78 07, fax 61 848 78 08

Administratio Locorum – Gospodarka Przestrzenna
Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego w Olsztynie
ul. Heweliusza 14, 10-724 Olsztyn, tel. 89 523 36 61, fax 89 523 34 38

Architectura – Budownictwo
Oeconomia – Ekonomia
Wydawnictwo Szkoły Głównej Gospodarstwa Wiejskiego w Warszawie
ul. Nowoursynowska 166, 02-787 Warszawa, tel. 22 593 55 20, fax 22 593 55 21

Formatio Circumiectus – Kształtowanie Środowiska
Wydawnictwo Uniwersytetu Rolniczego w Krakowie
al. 29 Listopada 46, 31-425 Kraków, tel. 12 662 51 57, 12 662 51 59

ISSN 1644-0757
1644 0757