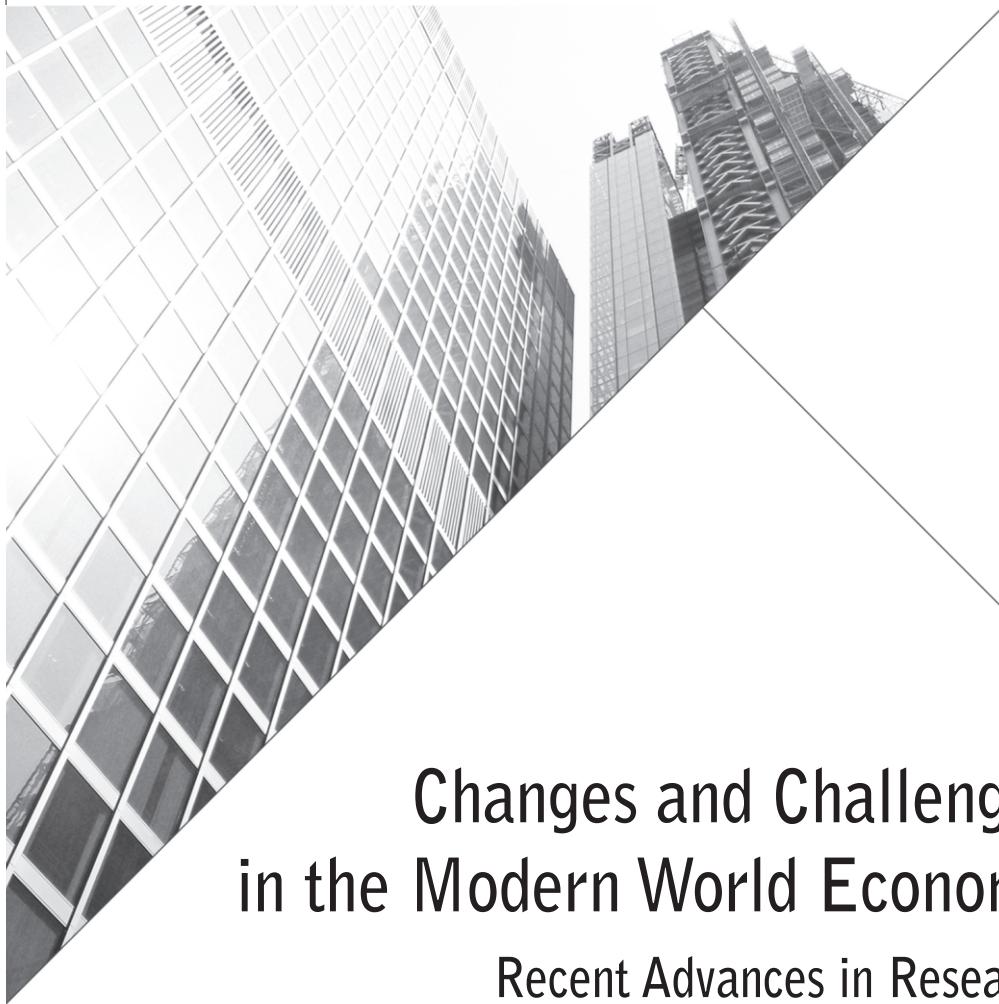


# Changes and Challenges in the Modern World Economy





# Changes and Challenges in the Modern World Economy

## Recent Advances in Research on International Economics & Business

Edited by  
Tomasz Rynarzewski, Maciej Szymczak

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## Introduction

The book was prepared by the academics and doctoral students of the Faculty of International Business and Economics of the Poznań University of Economics and Business to celebrate the 90th anniversary of the University and the 10th anniversary of the Faculty itself.

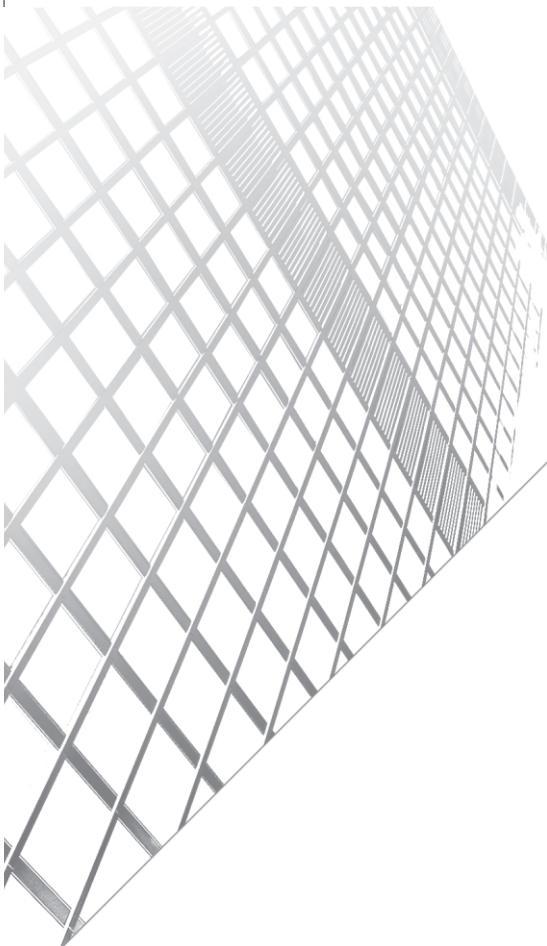
The subject of this Volume reflects the variety of issues that are researched by academics from all departments of the Faculty. The rationale for publishing this Volume was to signal current work and research progress in the area of international economics, business and management. As the title of the Volume suggests, we need to anticipate changes and implement a new approach to face the challenges in the world economy for it is transforming in an unprecedented way now, at a fast pace, and the global economic map is constantly redrawing. Papers published in this Volume are written by individual authors and workgroups. They are results of research conducted in departments and have been assigned to eight chapters discussing crucial aspects of the world economy. The deliberations are held on a micro- and macroeconomic level in both theoretical and empirical terms.

We hope that the contents of individual papers will inspire both readers and authors themselves to make further studies, to carry out follow-up research, to network with one another in order to find answers to the most important problems of the world economy and international business.

*Tomasz Rynarzewski  
Maciej Szymczak*







# The Advances in Theoretical and Methodological Concepts



Marian Gorynia<sup>1</sup>

## On the interdisciplinary nature of international business<sup>2</sup>

### Introduction

International Business (IB) is a sub-discipline<sup>3</sup> within economic sciences, which deals with the research on economic activity on an international level. Progress in practicing the science on the one hand gives rise to an implication for deepening the specialization among researchers, on the other hand, the question arises of the danger of isolating the results of individual studies and inability to integrate and synthesize them in the broader theoretical concepts. This integration and synthesis are not possible as a rule without interdisciplinary and multidisciplinary research. While the trend towards specialization is widely noticeable and accepted, these threats are rarely the subject of reflection. The purpose of this paper is to indicate the peculiarities of including IB in economics, to make diagnosis of the condition and the degree of its interdisciplinarity, and to outline possible scenarios for the evolution of the scope of the subject of research interest of this sub-discipline in terms of implementation of the demands of interdisciplinarity and multidisciplinary.

### 1. Introductory remarks – philosophy of science, theory, specialization, interdisciplinarity, multidisciplinary, transdisciplinarity

“Economy needs philosophy” [Hardt 2013, p. 9] – this quotation immediately calls for an elaboration. Economic sciences, social sciences, all sciences need philosophy.

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<sup>1</sup> Poznań University of Economics and Business, Faculty of International Business and Economics, Department of International Competitiveness.

<sup>2</sup> In preparing this article, reference was made to the previous study: [Gorynia 2012].

<sup>3</sup> The further sections of this article explain why the IB is treated as a sub-discipline, not a discipline in the branch of economic sciences.

Virtually every scientific discipline is based on some philosophical basis, in particular those concerning the relationship between studied reality and theory, which is a product of doing science. The order of the terms in the previous sentence is not accidental. The reality, which we study is primary, and both cognitive processes and their creations, namely knowledge, and in specific cases a theory, are secondary.

What exactly is theory and what is its relationship with the studied reality? In contemporary philosophy of science, the notion is often encountered that the optimum philosophical position contributing to the success of science is a position of philosophical realism, which can be summarized in three points [Hardt 2013 pp. 11–16; Bunge 1967, p. 291]:

- reality of the external world, or independence of the world observed from a subject learning it,
- the outside world, or reality has a multi-layered complex structure,
- the outside world is knowable.

The product of scientific research is scientific knowledge, often identified with a theory. Research should meet certain conditions, comprising the criterion of rationality. It should have an established objective, use the results eligibility criteria for scientific knowledge, use the methods deemed appropriate by specialists, and it should be formulated to respect the principles of editing scientific texts. A particular, advanced case of scientific knowledge is a theory. The definition of a theory proposed by Sztompka well describes the relations between the studied reality (the outside world) and the theory describing scientifically this reality [Sztompka 1985, pp. 12–13]. According to this author, theory involves three groups of statements (assumptions):

- general theoretical and methodological orientation, which consists of ontological theses (what is the nature of reality?), epistemological theses (what can be investigated?) and methodological directives (what are the desirable ways of studying reality?);
- conceptual model, which includes a set of associated analytical categories comprising a particular vision of the world, its structure and mechanisms of its functioning and change;
- empirical theory, which is a collection of interrelated statements about relationships between variable characteristics of the observed phenomena and processes.

The scientific activity commonly accepts an assumption that reality has a complex multi-layer structure, which has a hierarchical construction. This assumption has been included in the concept of general systems theory, which assumes that from a biological point of view, the universe is a hierarchy ranging from elementary particles to the supra-individual organizations [Bertalanffy 1984, p. 58]. The assumption of the hierarchical structure of the universe was then transferred per analogy from biology to other disciplines, including the social sciences, particularly economic sciences. Therefore, multilayer structure (multifacetedness) and extensive

hierarchical structure of reality make it increasingly complex in the conditions of successive scientific discoveries and overall progress in science.

The indicated complexity of the studied reality implies the need for specialization, and the interrelationship between the various elements and aspects of the studied reality make the research going beyond the boundaries of narrow, specialized and hermetic disciplines imperative [Gorynia and Kowalski 2013, p. 457]. Thus, on the one hand there is the paradox of the objective complexity of the studied world and specialization forced by these circumstances. On the other hand, we are in danger of atomising science and shredding it into increasingly detailed disciplines and sub-disciplines without ensuring the integration and synthesis of dispersed results. This circumstance, this paradox could, in extreme conditions, call into question the social utility and functionality of science.

One of the solutions to address the progressing<sup>4</sup> complexity of the studied reality is specialization. Specialization itself, however, is dangerous. Interdisciplinary and multidisciplinary research is needed. At this point, we will conclude that the IB as a sub-discipline of economics is also subject to the indicated tendencies.

## 2. Classification of science in Poland and the interdisciplinarity, multidisciplinary and transdisciplinarity of research

The official classification of scientific areas, branches and disciplines is primarily pragmatic, related to the operation of certain aspects of academic life (scientific promotions, organization of research institutions, university organization, market of research journals, etc.). The need for a possibly logical and transparent classification of scientific knowledge of economic activity sometimes raises concerns, which is difficult to agree with. This classification is necessary for many reasons:

- it serves organising research (which does not deny the postulate of conducting interdisciplinary research),
- it is useful in organizing the educational process,
- it is used to assess the scientific accomplishments of applicants for scientific promotion (doctoral degree, postdoctoral degree, the title of professor).

Most often, it is assumed that the criteria for the division of science into its component parts (branches, disciplines, specialties, etc.) are:

- research objects and science issues relating to them – subjective differences,

---

<sup>4</sup> The complexity of studied reality is its objective characteristic. The use of the term “progressive complexity” aims to draw attention to the fact that as more and more advanced research is conducted, there can appear an (illusory?) impression that indeed the reality is becoming increasingly complex.

- study methods and theories developed with their use – methodological differences,
- appropriate scientific languages – language differences [Cf. Pabis and Jaros (2009, p. 22)].

It must be added that these criteria must be met jointly. A somewhat simpler version just states that the fragments of science are isolated due to the subject matter and method. An interesting example of the delimitation of a discipline in the layer of theoretical approaches, research methods and conceptual grid is provided by Ruszkowski [2014].

The most commonly used division of science into component parts is a division applying three stages: branch of science, discipline of science and scientific specialties. These are defined as follows:

- “a branch of science is a coherent system of knowledge with common laws, theories and methods of its disciplines, used to create scientific knowledge in the branch,
- a discipline of science is a system of knowledge containing particularized laws, theories and methods used to resolve specific scientific problems and expanding knowledge in the branch which it belongs to,
- a scientific specialty is generated by its studied objects, and enables studying or designing with scientific methods of disciplines of a chosen type of mental or physical objects, whereby it may be part of one basic discipline, but can also belong to a number of disciplines” [Pabis and Jaros 2009, p. 22].

It should be noted that officially also a category broader than the above-mentioned is distinguished, namely areas of knowledge. The branch of economic sciences belongs to the area of social sciences (in addition to the branch of social sciences, and branch of legal sciences) (Regulation of the Minister of Science and Higher Education of 8 August 2011 on the areas of knowledge, branches of science and art, and scientific and artistic disciplines).

According to the cited regulation, the branch of economic sciences distinguishes four disciplines: economics, finance, management sciences, and commodity science.

It should also be noted that informal attempts are often made to propose further, more detailed description of the list of research interests, and the subject of research in the form of sub-disciplines distinguished within individual disciplines. For example, Fiedor [2013, p. 2] distinguished the following sub-disciplines within the discipline of economics: theory and methodology of economics; microeconomics; macroeconomics; mesoeconomics; international economic relations; economic history; economy and regional policy with spatial planning; economic geography; social policy; marketing-market studies; statistics, econometrics and operational research; agricultural and rural economics, labour economics and industrial relations; ecological and sustainable development economics. According to the same

author, it is possible to distinguish the following sub-disciplines in the discipline of finance: financial management of enterprises; public finances; personal finance, financial markets and accounting and financial reporting. In turn, management sciences include the following sub-disciplines: management methodology; management methods and instruments; strategic management; operational management; resource management and economic IT.

A commonly known and applied example of the division of economics discipline into components is a classification developed in the framework of the Journal of Economic Literature (<https://www.aeaweb.org/econlit/jelCodes.php?view=jel>). It is used to organize the scientific literature within that discipline. It distinguishes 20 general categories, which are further divided into specific categories. General categories include: General Economics and Teaching; History of Economic Thought, Methodology, and Heterodox Approaches; Mathematical and Quantitative Methods; Microeconomics; Macroeconomics and Monetary Economics; International Economics; Financial Economics; Public Economics; Health, Education, and Welfare; Labour and Demographic Economics; Law and Economics; Industrial Organization; Business Administration and Business Economics, Marketing, Accounting, Personnel Economics; Economic History; Economic Development, Innovation, Technological Change, and Growth; Economic Systems; Agricultural and Natural Resource Economics, Environmental and Ecological Economics; Urban, Rural, Regional, Real Estate, and Transportation Economics; Miscellaneous Categories; Other Special Topics.

As noted, an important premise for ordering areas, branches and disciplines are competence considerations in the assessment of applications for scientific promotions. The idea is that the achievements of a candidate for the degree or an academic title are assessed by a professional reviewer. The fulfilment of this demand does not exclude interdisciplinary, multidisciplinary or even transdisciplinary research with a view to preparing the promotion papers, it can, however, give rise to certain problems with the definition of a paper for a specific discipline. The aforementioned three possible relations (interdisciplinarity, multidisciplinary, transdisciplinarity) between related disciplines are often defined differently in the literature. The scope of these concepts is not clear and unambiguously recognised in the literature. In some approaches, the concept of interdisciplinarity is considered synonymous with the concept of multidisciplinary as well as with the concept of transdisciplinarity [Nowak-Far 2014, p. 106]. A different position is presented by Gagatek [2014, pp. 337–338]. In his view, multidisciplinary involves interaction of two or more disciplines. To speak about interdisciplinarity it is still necessary to fulfil the condition of integration and synthesis of approaches specific to each discipline. And “transdisciplinarity is no longer even integration or communication between disciplines as going beyond disciplines, a kind of transcendence of disciplines” [Gagatek 2014, p. 338].

In this study, it is assumed that the interdisciplinarity can be understood in at least four ways:

- studies conducted in a given discipline refer adjunctively to other disciplines located in another area of science (for example, references of economics and management sciences to the general systems theory having biological roots; another example is the reference of economics and management sciences to the theory of evolution – the evolutionary theory of enterprise);
- studies conducted in a given discipline refer adjunctively to other disciplines located in another branch of science, but belonging to the same area of science (for example, recognition of the company as part of the economic theory of property rights refers to the discipline of the “law” belonging to the branch of legal sciences; another example is reference of economics and management sciences to the concept of embeddedness known in sociology; another example is reaping the achievements of psychology by scientists engaged in finance, which led to the emergence of behavioural finance);
- studies conducted in a given discipline refer adjunctively to other disciplines located in the same branch (for example, enterprise theories developed within economics and management sciences often refer to the concepts developed by the discipline of finance);
- studies conducted in a given sub-discipline refer adjunctively to studies belonging to other sub-disciplines within a given discipline (this case of interdisciplinarity is easy to question from the position of pure logic, but it is sometimes respected by some).

It should be recalled that in fact the condition of interdisciplinarity in the strong version should assume that the reference to other disciplines at the same time relates to the object of research, methodology and language. Often, however, this condition is treated in a gentle, detachable way – then a relation to another discipline in any of the three planes is sufficient.

The issue of interdisciplinarity and multidisciplinary may also be perceived from the perspective of mutual, relative meaning, weight, or the role of disciplines entering research interactions. The mentioned varieties of interdisciplinarity assume that in conducting research, we deal with the main, or basic, or dominant, or leading discipline, and an additional, or supporting discipline, treated adjunctively. This understanding of interdisciplinarity on the one hand does not create barriers to research referring to theoretical approaches, research methods and conceptual models drawn from other disciplines, and on the other hand does not create problems in qualifying research to an area, branch and discipline, for example, in matters of promotion or allocation of funds for research.

Meanwhile, the concept of multidisciplinary may be associated with the research on a specific part of the reality from the cognitive perspectives of at least two disciplines, which in the research remain in mutual relation of relative equivalence.



Here, of course, one may also generate at least several types of multidisciplinary, depending on which branches and areas the discipline in question belongs to. A good example relating to two disciplines from one area and one branch is a strategic management [Gorynia, Jankowska and Owczarzak 2005]. This sub-discipline to a relatively similar, balanced extent derives both from economics and from management sciences. Econophysics is a different, but in many ways distinct example. Here we deal with a parallel emphasis on the concept of economics and physics.

### 3. Manifestations of interdisciplinarity and multidisciplinary in international business

International Business is certainly a sub-discipline belonging to the branch of economic sciences. As for the assignment of IB to the specific discipline of economics, there are considerable doubts. Under the current Polish classification of disciplines, IB is not a separate discipline within the branch of economic sciences. Relationships of IB with other disciplines outside the native branch and the native area of science are similarly ambiguous. Therefore, it seems that an in-depth reflection on this subject is warranted.

Tables 1 and 2 present possible relations between two attributes of the economics and management sciences disciplines<sup>5</sup>. These disciplines seem to be those institutionally distinguished parts of the branch of economic sciences, which include the issues forming IB as a sub-discipline of economics. These attributes are a level of analysis (the object of cognition) and the aspect of economic activity. As far as the level of analysis is concerned, the simplification was adopted that there are two levels of analysis: macro and micro. Moreover, two aspects of business were distinguished: national and international aspect. Separating these aspects in the internationalised and globalised world is only relevant analytically, but at the same time, many authors of studies in the field of IB emphasise the real, actual specificity of economic activities carried out on an international scale. Question marks in Table 2 are to raise awareness of an issue whether it is appropriate to relate the object of knowledge in management sciences also to the macro level.

Table 1. Economics – the matrix of levels and aspects

Level / Aspect	Macro	Micro
National	closed economy / macroeconomics of closed economy	company exclusively on the domestic market
International	open economy / macroeconomics of open economy	company on the international market

<sup>5</sup> This section of the article uses the fragments of the study by Gorynia [2012].

Table 2. Management sciences – the matrix of levels and aspects

Level / Aspect	Macro	Micro
National	management of closed domestic economy / economic policy in a closed economy?	management on the domestic market
International	management of an open domestic economy / economic policy in an open economy?	management on the international market international management

If we assume that it is possible to outline even an approximate boundary between economics and management sciences (as indicated above, this is not a universally shared view), then we can also imagine the separation of international economics and international business, which in this case would conventionally be an equivalent of international management<sup>6</sup>.

Therefore, we can propose a terminology convention, according to which international economics is part of economics, relating to international aspects of business, and international business is part of the management sciences concerning aspects of international business management (international management).

The following questions and concerns emerge with regard to the above proposal:

- if international economics is part of economics, does it include both macro and micro level?
- if international business is part of management sciences, does it include both macro and micro level?
- is it possible to suggest a common name for a sub-discipline covering jointly international economics and international business?

The answer to the first two questions may seem relatively simple, once we accept the earlier unequivocal findings regarding the content of Tables 1 and 2. In this case, the bottom row of Table 1 would mean international economics, and the bottom row of Table 2 would refer to international business. It turns out, however, that the confrontation of this conclusion with the practice of scientific research and teaching in various countries does not provide indubitable outcomes. In particular, it is not clear whether international economics refers to both levels, or only to the macro level. The reverse question concerns the management sciences in an international context – do they relate only to the micro level? It is therefore necessary to look at scopes of the concepts of international economics and international business encountered in the literature.

Following the proposal presented earlier, international economics is a part of economics, which refers to international aspects (bottom row in Table 1). Krugman and Obstfeld [2000, p. 2] note that international economics uses the same basic method of analysis as other areas of the economy, since the motives and behaviour of consumers and businesses are the same in international trade, as in

<sup>6</sup> J. Rymarczyk [2012, p. 23] notes that the Polish equivalent of international business is sometimes considered “international entrepreneurship”, but points out that the term is less commonly used.

transactions within countries. The specificity of international economics stems from the fact that international trade and international investment take place between sovereign states. Substantively, a similar point of view on the essence and object of international economics is presented by Kjeldsen-Kragh [2002, p. 11]. In his view, international economics is traditionally divided into two sub-areas. The first deals with international trade and international investments, which together have an impact on the distribution of production between countries. The second sub-area refers to monetary issues and includes issues such as the balance of payments, exchange rates and the impact of macroeconomic policy. In both studies, we deal with the leading role of macroeconomic factors, but the micro variables are also present in the discussion.

The classic work by Root [1984] is titled *International Trade and Investment*, which at the name level overlaps with the first subarea of international economics mentioned by Kjeldsen-Kragh. The book is dominated by the macroeconomic point of view, with a smaller share of the micro aspects.

According to Salvatore [1998, p. 7] international economics deals with the economic interdependence between countries. The macroeconomic approach prevails in the paper, but some issues analysed are illustrated in the form of presentation of cases relating to the microeconomic level.

In light of the above presented views, it seems reasonable to repeat the question as to whether the object of interest for international economics is located at the macro or micro level, or refers to both levels simultaneously. In principle, analysis of the contents of the papers with titles including the term «international economics» clearly indicates that the main domain of interest of international economics is macroeconomic level with a relatively lower share of microeconomic aspects. With reference to Table 1, it can be stated that the research area of international economics does not apply equally to the entire bottom row, but is primarily concerned with the “Open economy/Macroeconomics in open economy” box. According to Żukrowska [2014, p. 127] economics is an interdisciplinary science by definition, which is clear from the differences between the perspective of the analysis of micro – and macroeconomics. If we agree with this view, it implies a conclusion that both studies within economics and international economics have an interdisciplinary character. Interdisciplinarity, in the specific meaning adopted by the cited author is closely connected with both macro – and microeconomic analyses.

According to the above proposal, international business is the part of management sciences concerning the international aspects of business management (the graphic illustration in Table 2 shows that the concept of international business can be referred to the entire bottom row of this table). We should recall the already asked question as to whether management sciences as such, in their international aspect relate only to the micro level or whether they also include macro level. The

following section will review the definition of “international business” and establish the meaning of this term for further discussion.

Based on the literature and intuition, it seems that the concept of international business in the broad sense of the word may identify all types of economic activity, provided that they take place between countries, regardless of whether the relations refer to states as a whole, industries, sectors, regions, businesses, consumers, entrepreneurs, and regardless of whether they are relations of a real or regulatory nature. The proposed definition of international business will be juxtaposed with other definitions appearing in the literature. At the beginning, it should be noted that in many basic studies in the field of international business authors do not touch upon the definition of the term [Tayeb 2000; Czinkota, Rivoli and Ronkainen 1989]. One might hypothesise about the grounds for this situation. The first interpretation might suggest that the definition of international business is so obvious that it is quite enough to perceive and understand it intuitively. The second possibility is that the authors deliberately avoid definitional meandering, realizing the difficulty of precise defining that category. It seems that neither the one nor the other approach is appropriate. Conscious and possibly precise definition of the basic concepts is in fact an elementary requirement of practicing science.

Rugman and Hodgetts [2000, p. 5] define the international business as a discipline dedicated to the study of transactions taking place across national borders in order to meet the needs of individuals and organizations. Shenkar and Luo [2004, pp. 9–10] believe that international business refers to the business, which involves the transfer of resources, goods, services, knowledge, skills and information across national borders. International business consists of international transactions, among which international trade and foreign investment come to the fore. Daniels and Radebaugh [1989, p. 6] claim that international business is all business transactions, which involve at least two countries. According to Griffin and Pustay [1995, p. 8] international business consists of transactions, whose characteristic is that the parties are entities from at least two countries. The significant features of international business distinguishing it from domestic business include: the use of different currencies, validity of different legal systems, cultural differences. Ball and McCulloch [1990, pp. 13–14] emphasise an important circumstance of conducting international business. Namely, they point out that a company operating across borders has to cope with and operate in three environments – in a domestic environment of the country of origin, in a foreign environment of an expansion country and in the international environment.

The above quoted definitions seem to confirm the adequacy of the definition of international business proposed at the beginning of this subsection.

In light of the above views, it is reasonable to repeat the question of whether the object of interest for international business is located at the macro – or micro-level or whether it refers to both levels simultaneously. The discussion indicates that

the dominant level of analysis in the context of international business is micro-level, with the presence of macroeconomic aspects. With reference to the view by Żukrowska cited earlier, it must therefore be concluded that international business is a sub-discipline with hallmarks of interdisciplinarity.

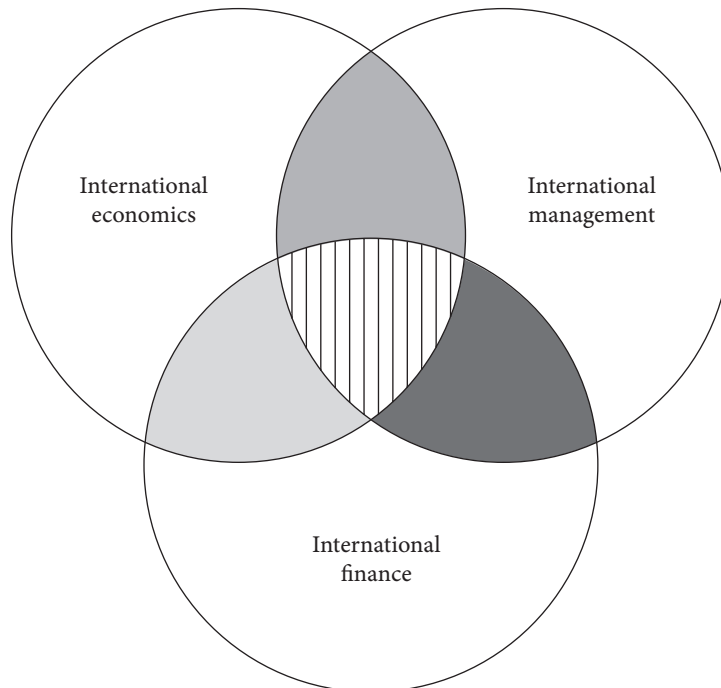
Being aware of the simplicity, one might still conclude that the primary domain of interest of international economics is the level of national economies (macro), and the primary domain of interest of international business is the level of companies engaged in international business (micro level). Meanwhile, from the perspective discussed herein, another observation is most crucial – even if attempts are made to separate international business and international economics, it is not disputed that, in researching international transactions representing the domain explored by IB, one should always take into account the context of those transactions, associated with international economics. The fact that the individual business relations take place in an environment co-created by the relations on the interstate level results directly in the need to consider the wider international macroeconomic environment in terms of research conducted by specialists in IB. In this sense, the interdisciplinarity of IB in relation to economics seems clear.

However, interdisciplinarity of IB should not be limited only to the issue of relations with the discipline of economics. Important manifestations of interdisciplinarity of IB are also relations of the sub-discipline with the discipline of finance. IB is always associated with contractual obligations (supply of goods/services), which correspond to the mutual primarily having the character of financial flows. Therefore, the issues emerge regarding cost of capital, cost of financing transactions, methods and techniques of accounting, credit, foreign currency exchange, exchange rate risk, insurance, leasing, etc. or all that can be described jointly as financial aspects of international transactions.

To illustrate better the interdisciplinarity of IB, at this point we should articulate again the assumption of diversity of economic activity in domestic and foreign (international) terms. The adoption of this assumption makes it possible to separate international economics as part of economics, international management as part of management sciences and international finance as a component of finance. Interdisciplinarity of IB, associated most often with international management can then be displayed graphically, where three circles represent three (sub)disciplines (separated due to the explored aspect of business – domestic, foreign) – international management, international economics, international finance.

Each pair of these sub-disciplines has a specific common field: international economics and international finance – the oval marked in orange; international management and international finance – the oval marked in red; international management and international economics – the oval marked in blue. Additionally, attention must be drawn to the common field for all three circles marked with vertical black lines. The field marked in blue, the field marked red and the field marked

with vertical black lines represent a graphic illustration of the interdisciplinarity of IB (international management), with the first two fields referring to a single interdisciplinarity (IB enters into an interdisciplinary relation with one discipline), and the last being a double interdisciplinarity (IB remains here in interdisciplinary relations with two other sub-disciplines).



Graphical presentation of the relations between the scopes of three (sub)disciplines

Considering the scope of research conducted within IB, it is also worth noting that one of the most important journals dedicated to IB – Journal of International Business Studies (JIBS) indicates that six sub-domains<sup>7</sup> of study stand out within this sub-discipline:

- the activities, strategies, structures and decision-making process of multinational enterprises;
- interactions between multinational enterprises and other actors, organizations, institutions, and markets;
- cross-border activities of firms (e.g., intrafirm trade, finance, investment, technology transfers, offshore services);

<sup>7</sup> The term sub-domains should not be linked with the areas of knowledge present in the Polish classification of scientific activity.

- how the international environment (e.g., cultural, economic, legal, political) affects the activities, strategies, structures and decision-making processes of firms;
- the international dimensions of organizational forms (e.g., strategic alliances, mergers and acquisitions) and activities (e.g., entrepreneurship, knowledge-based competition, corporate governance);
- cross-country comparative studies of businesses, business processes and organizational behaviour in different countries and environments [Journal of International Business Studies 2015].

Furthermore, there is also some significance in the declaration of the JIBS editorial team that as an interdisciplinary journal, JIBS expects publication submissions from the representatives of business disciplines, such as accounting, finance, management, marketing, as well as from other disciplines, for example, economics or political science. It is also emphasised that the interdisciplinary articles are particularly desirable in the journal.

These types of clear evidence of interdisciplinarity of international business are aplenty. It is also worth mentioning that each time, annually defined groups of issues (conference tracks) during the conferences of organizations such as the Academy of International Business or the European International Business Academy are interdisciplinary in nature.

## Conclusions

The discussion provides a conclusion that the interdisciplinary nature of the IB sub-discipline originates primarily from the peculiarities of this part of economic reality, which is of interest to IB. If we look at IB from the ontological perspective, we notice that the studied and analysed reality in principle consists of international transactions, in particular those aspects of them, which are associated with effectiveness and efficiency. Therefore, the question is what are the determinants of effectiveness and efficiency of international transactions? The list of these determinants is certainly long: supply, demand, prices, resources, technology, innovation, human resources, tax, insurance, credit, financial, accounting considerations, etc. These are the most characteristic determinants, evocative of economics and management. Nevertheless, the list should be developed to include the issues of qualifications of employees, in particular, managers, legal considerations, issues of cultural differences, psychological determinants, sociological variables, issues of political science, economic geography, regional, international relations etc. It is worth noting that some of these aggregate variables are the focus of disciplines and sub-disciplines other than international economics, international finance and IB. However, their inclusion in the analyses of international transactions is nec-

essary from a purely pragmatic perspectives – the transactions take place in the real economic world, which is inherently complex, multi-layered and therefore by definition interdisciplinary.

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## Evaluation of the company internationalisation process: traditional and network perspective

### Introduction

More and more companies internationalise their business. Companies engaging in operations outside the local market become a natural stage of development of the company, or more often the beginning of its operation [Reinventing 2015]. The universality of the phenomenon of internationalisation and, therefore, its great importance in the operation of enterprises, make many researchers undertake in-depth studies of the internationalisation process of a company.

The internationalisation of a company can be an important stage in the development of the company and the decision to go beyond the local market is mostly exploring further possibilities of success. In practice, the initiative to set up the company and start commercial activities may be related to the belief that only the company's entry to foreign markets in the initial phase of development will contribute to its market success.

Regardless of the time of internationalisation of the company, its internationalisation is to affect to a greater or lesser extent the success of the company. Not every company's internationalisation ends successfully, however. Also, the assumed level of implementation of the market objectives of the company is different with respect to various studied companies. Hence the question of the determinants of success of a company internationalising its business. Most often the literature stresses the importance of "hard" evidence of success such as product or distribution. The authors' intention is to look at the process of internationalisation as the source of the market success or failure of the company through the prism of its relationships with environment.

The aim of this article is to review the existing methods for measuring the internationalisation of the company and indicate their use in determining the impact of the internationalisation process of the company on its performance. Against the

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background of the diagnosis of a variety of methods to assess the internationalisation process, an approach will be presented which, according to the authors, allows a slightly different approach to the issue discussed, namely from the perspective of network approach. This perspective, based on the proposed concept of maturity of company in terms of internationalisation means the evaluation of the process of internationalisation of company in the context of its effectiveness (impact on company performance) based on the analysis of the overall relationship of a company with the environment.

The considerations presented in this paper are part of a longer three-year research project. Its first stage was aimed at developing the conceptual framework of company internationalisation maturity, based on the latest subject literature and supported by earlier research conducted by the present authors on company behaviour in the internationalisation process. The next stages focused on qualitative and quantitative research. The results of qualitative studies [Fonfara, Małys and Ratajczak-Mrozek 2015; Dymitrowski and Soniewicki 2015] as well as outcomes of the quantitative questionnaire survey (which has just been finished) support and confirm a cognitive value of the proposed concept of company internationalisation maturity<sup>2</sup>.

## 1. The process of internationalisation and a company's performance

According to the assumptions, the process of internationalisation in this paper will be analysed in the context of the results achieved by a company.

The internationalisation of a company is most often analysed as a process taking place in a certain period of time. Hence, the process approach to internationalisation of a company taking into account the effect of time on its implementation is fully adequate with from both the learnt and practical point of view. Other perspectives, in particular behavioural, indirectly or directly take into account the changing behaviour of a company with the passage of time for the internationalisation of a company.

Studies of a company's success in the internationalisation process usually highlight the tangible set of factors that have a positive effect on company performance (increased sales, profits and market share). Particular emphasis is given to the importance of a perfect product, a recognized brand, unique distribution solutions etc. in developing a competitive advantage or, to put it simply, in achieving better

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company performance than this of the closest competitors [Hooley, Piercy and Nicoulaud 2008; Kotler and Keller 2012]. The impact of these factors on company performance in the process of internationalisation is indisputable. This has been demonstrated by numerous research results and case studies. In this situation, if a company is more adept than its closest rivals at tailoring a product or distribution system to meet overseas buyers' needs, this is a proof of its higher level of internationalisation maturity.

In addition to "tangible" sets of factors determining a company's success, we can identify other sets of determinants that have an impact on company performance. They usually have an intangible character and concern a company's relations with various foreign entities. In comparison with tangible factors, they are far less emphasised; in practice, it turns out that a company's operation as part of a business network is a significant factor in developing a competitive advantage [Berckhan 2015].

In the presented considerations the concepts of competitive advantage and business performance are used interchangeably. The literature commonly defines the competitive advantage of a company through the prism of the relative differences in the financial and non-financial effects of activities (performance differentials) compared to the achievements of the closest competitors [Ratajczak-Mrozek 2010, p. 46]. Therefore, the results of the company may be measures of competitive advantage when they are seen in relation to the nearest competitors [Fonfara 2007]. They are, in this case, like the competitive advantage, relative (not absolute) and they are always compared with the group of closest market rivals.

In practice, it is difficult to examine in general terms the impact of business relations of a company in the process of internationalisation on its market and financial performance. This is why, as suggested by many scholars, this paper analyses the impact of relationships from the angle of selected positive phenomena caused by contacts between entities. What is most strongly emphasised in this context is the trust developed between entities [Weitz and Bradford 1999; Sivadas and Dryer 2000; Kale, Singh and Perlmutter 2000; Dyer and Chu 2000], the exchange of knowledge [Verona 1999; Gillis 2007; Saraf, Langdon and Gosoin 2007], and the acquisition and transfer of experience from a business partner [Kotabe et al. 2013].

Presented by the authors, the evaluation of the process of internationalisation in network terms is based on the proposed concept of company maturity in terms of internationalisation [Fonfara 2015]. Based on the suggestions of the aforementioned researchers and own previous studies, the authors extracted a number of variables named components of company maturity in the internationalisation process. They affect, according to the authors, shaping the competitive advantage of the company and its market and financial results.

## 2. Overview of traditional methods of measuring the internationalisation of the company

The literature points to the two approaches to measuring the degree of internationalisation of the company [Przybylska 2006]:

- the use of one or a group of separate indicators – (analytical indicators),
- the use of aggregate indicator covering a certain number of analytical indicators (synthetic indicators).

The synthetic index comprises a group of at least two analytical indicators. When creating a synthetic index, however, an attempt is taken to quantify various analytical (single) internationalisation indicators in such a way that a comparison can be made of the scope of internationalisation of companies based on their aggregate value.

Analytical indicators used to measure the internationalisation of enterprises can be divided into [Przybylska 2006]:

- structural,
- market,
- presenting experience of managers.

Structural indicators measure the commitment of companies on foreign markets within a certain period of time (usually a calendar year) in specific areas, important from the perspective of the researcher. The most commonly used in practice structural indicators include the number of supported foreign markets, the number of foreign affiliates (or a share in the number of branches in total), forms of foreign expansion, the value of sales in foreign markets (or share of the total), the number of employees abroad (or share in number of employees in total), the value of fixed assets abroad (or share in total fixed assets) number of non-equity forms of internationalisation, the added value of production abroad, the number of stock exchanges on which the shares are listed, the share of foreign investors in the share capital, geographic spread of supported foreign markets, the number of entities with which the company maintains relationships in foreign markets, number of entities with which the company maintains relationships in foreign markets, the strength of ties on foreign markets, length (measured in years) of activity on foreign markets [based on Johanson and Vahlne 1977; Sullivan 1996; Dorrenbacher 2000; Fonfara et al. 2000; Rymarczyk 2004; Przybylska 2006; Pangarkar 2008; Ratajczak-Mrozek 2010; Fonfara 2012; Małys 2013].

The comparison of different companies' internationalisation is possible only under specific, selected indicators (e.g. a company operating in the analysed period in 10 foreign markets in this respect is more internationalised than a company established on 1 foreign market). Depending on the indicator, it is possible to measure both active and passive internationalisation.

The use of more than 1 analytical indicator, without their synthesis (aggregation) can make it very difficult to compare the scope of internationalisation of companies (e.g. it is difficult without additional efforts to compare the level of internationalisation of a company operating on 10 foreign markets pursuing 10% of total sales there and a company that operates on 1 foreign market, pursuing 90% of total sales there). But it is a shortcoming of all analytical indicators.

An additional disadvantage of the structural indicators is the lack of reference to the market results (success or failure) in foreign markets. This issue is addressed, however, in the construction of market indicators.

Market indicators are designed to measure the degree of success of a company in foreign markets. It is measured from the perspective of the demand or supply and associated with the value of the traded commodities [Przybylska 2006]. Taking account of the demand, the level of internationalisation of business activity is often measured by the value of exports from the home country plus revenues from sales of foreign branches and reduced by exports of foreign branches to the parent country. Using this method of measurement of internationalisation, due to the use of absolute values, internationalisation level usually increases with the size of an analysed company. Small businesses, even in case of realization of total sales abroad a business location, due to the possibly relatively small value of sales, may be considered not internationalised enough.

In addition, the market demand indicator does not refer at all to the concept of passive internationalisation.

Taking into account the supply perspective in determining market success in the internationalisation process comes down to determining the share of the production of foreign branches in total production. The only criterion for determining the level of internationalisation is therefore decisions concerning the location of production.

The last group of analytical indicators are the indicators presenting experience of managers in conducting foreign operations and their perception of the foreign markets. In practice, it comes down to determining the international orientation of a company – ethnocentric, polycentric, region-centric, global or local. The result of the analysis is therefore an indication of how foreign markets are perceived by the company management in relation to the home market. This kind of indicator seems to be a good complement for other types of analysis. Its flaws include focus on the management approach to foreign markets and the abandonment of important indicators, allowing for easy comparison of different businesses (e.g. share of sales on foreign markets in total sales).

Another approach to measuring the level of internationalisation of a company involves the use of synthetic index, resulting from aggregation of a group of selected analytical indicators. As a result of the aggregation of different areas of international activities into a single indicator, it is possible to compare the level of internationalisation of various companies based on a number of elements.

Certainly the idea underlying the construction of synthetic indicators, which is determining the level of internationalisation of the company through a series of individual indicators aggregated into a single measure, is appropriate. However, their disadvantage is subjectivity in the selection of individual components of synthetic indicators. None of the previously proposed includes in a comprehensive manner the phenomenon of internationalisation. In particular, none of the indicators takes account of the network approach to internationalisation.

The concept of company maturity in terms of internationalisation proposed later in the article can be classified as synthetic method for measuring the process of internationalisation of a company. It complements the existing approach for measuring the internationalisation process (conventionally called traditional) with a network approach emphasising, as mentioned earlier, the importance of relations of a company with various stakeholders, such as buyers, suppliers, competitors.

### 3. The classic perception of company maturity in terms of internationalisation

Maturity is one of the characteristics of a company, which determines its behaviour in the market. The mechanism of the impact of this feature on the activity of a company is presented in the form of maturity models. They describe the actions taken by a company, taking into account the different levels of maturity [Fraser, Moultrie and Gregory 2002]. The models concern the sphere of business process management. Among them the most well-known examples include: Capability Maturity Model Integrated (CMMI) [Paulk 1993], Business Process Management Maturity Model (BPM MM) [Rosemann and de Bruin 2005; Rosemann, de Bruin and Power 2006] and Process Management Maturity Assessment (PMMA) [Rohloff 2009]. Over time, the new models of maturity began to appear. They concerned quality management, research and development, project management and many other fields [Schindlholzer et al. 2009].

Given the wide range of a company's activities, attention should be paid to the fact of possible actions on both the local and foreign markets. In case of a company operating internationally, a concept of maturity takes on an entirely new meaning. Due to the significant differences existing between the domestic and foreign environment, in relation to the international sphere, it is necessary to use the concept of maturity in the internationalisation process.

In the literature, there is a small number of sources relating to this issue in a comprehensive manner. The few examples should mention an article by B. Brenner and B. Ambos [2009] describing the maturity from the perspective of a control of branches of international companies, treating it as an activity increasing its range

of with the passage of time. Maturity in the process of internationalisation can also be reflected in the use of information technologies by a company to meet the increasing demands of globalization [Karimi, Gupta, Somers 1996, pp. 59–60]. It can also make a decisive impact on the number of innovations created by a company in the process of internationalisation [Dymitrowski 2014].

It should be noted, however, that, despite mentioning company's maturity in the internationalisation process, these publications describe the essence of this concept in a laconic way. This complaint concerns a substantial number of studies in which the maturity in the internationalisation process is used only as an indicator of the degree of internationalisation of a company.

In order to illustrate the complex nature of this issue, it is therefore necessary to recall the concept of J. Purgal-Popiela [2014, p. 102], which proves that there are two dimensions of international maturity of a company:

- the extent of involvement in the foreign activity,
- time of involvement in the foreign activity.

The scope of involvement in foreign activity concerns the amount and quality of activities undertaken by the company in relation to foreign markets. In contrast, the time of commitment to the foreign activity usually refers to the years of experience that the company has in the conduct of international business. It should be noted that this period may be different from the age of the company that determines the time of inception of the company. Age of the company, however, is an important factor that can affect the dynamics of internationalisation [Zahra and George 2002].

A slightly different perceptions of maturity in the process of internationalisation are presented by B. Hagen and A. Zucchella [2014, p. 502], who describe it as a change in behaviour of companies in the internationalisation process, as characterized by three factors: speed, scope and intensity.

A detailed definition of company maturity in internationalisation is provided by T. Äijö. According to him, maturity is a stable stage of internationalisation, as exemplified by the presence of a company in all target markets, having international workers at many levels of the organization and the effective introduction of new products and/or services, which can be achieved using international mergers and acquisitions [Äijö et al. 2005, p. XV].

The aforementioned definition is reminiscent of certain development strategies, usable by a company. In this context, significant differences between companies operating in an international environment should be mentioned. Some authors [Purgal-Popiela 2014, p. 107] show, for example, that maturity in the process of internationalisation depends on the attitude of a company's management, as foreign development of a company is reflected in its headquarters' relations with other parts of the organization.

One of the key factors enabling the classification of the entities participating in the process of internationalisation is the nature of the adopted path of development. Thus, there can be distinguish entities with staged or non-staged internationalisation.



It is significant that in case of companies characterized by skipping various stages of internationalisation (exemplified by International New Ventures) age is not an appropriate indicator of the development phase. It may however successfully communicate the degree of maturity in the process of internationalisation.

Due to the increasing significance of international cooperation it seems that the concept of company maturity should be considered in the context of relationships formed with foreign partners, as they affect the characteristics of the maturity of a company, modifying the scope of activity, gained experience and the dynamics of a company development. It therefore seems necessary to propose the concept of company maturity in terms of internationalisation taking into account the network approach.

#### 4. Evaluation of the company internationalisation process – network perspective

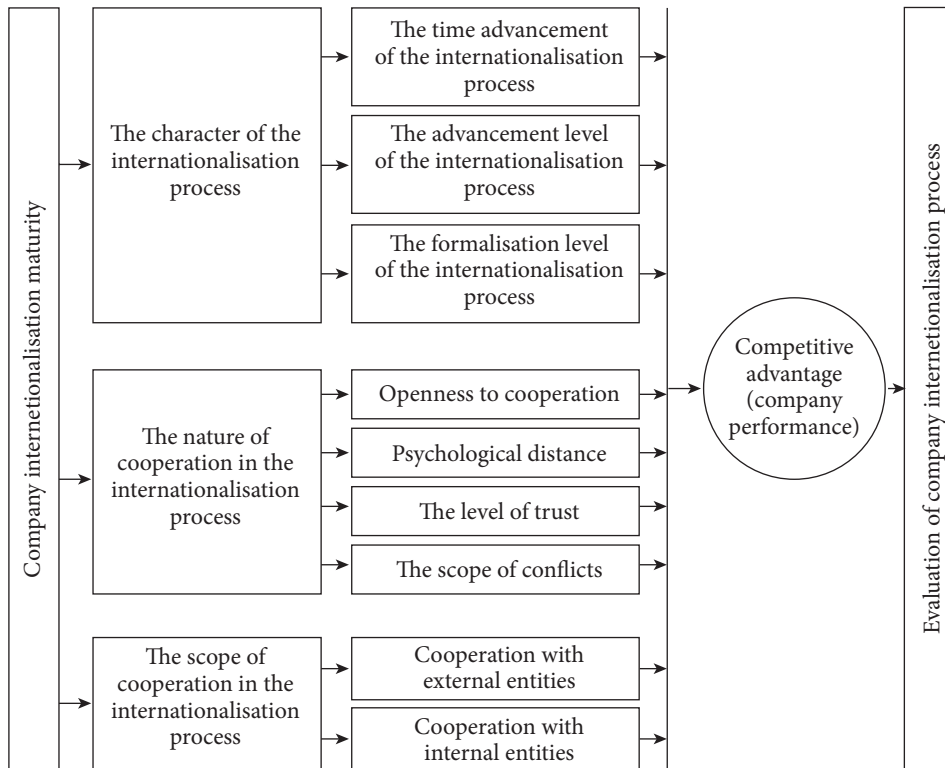
Evaluation of the process of internationalisation of a company in network terms is based on the assumption that a significant influence on a company's competitive advantage is had by its whole relationship with the environment. The network approach emphasises the importance of a company's relationships with various entities in the environment (buyers, suppliers and competitors) [Håkånsson 1982; Easton and Araujo 1989]. Crucial in making company internationalisation possible, these relationships determine the firm's behaviour during the internationalisation process [Fonfara 2014]. Not without significance in the internationalisation process are also relations with internal entities [Fonfara 2012; Ratajczak-Mrozek 2014].

Consequently, a company in the internationalisation process should initiate, establish and develop relationships with various entities operating both in the international environment and in the domestic market, as well as with those constituting an isolated part of the company (e.g. subsidiary).

As mentioned earlier, assessment of the process of internationalisation from the network perspective is based on the proposed concept of company maturity in terms of internationalisation.

Company internationalisation maturity is associated with an ability to create value for a company in the internationalisation process. Our assumption is that the higher the level of company internationalisation maturity, the higher the likelihood of attaining a competitive advantage and achieving relatively better results than those of the closest competitors. Therefore, in the concept presented, the level of internationalisation maturity becomes a basis for assessing the internationalisation process. Company internationalisation maturity is examined from the angle of three analytical planes, namely the character of the internationalisation process,

the nature of cooperation with entities in the internationalisation process, and the scope of cooperation in the internationalisation process. These three analytical planes, referred to as the main components of company internationalisation maturity, include a number of more specific components which, within the conceptual framework, were adopted on the basis of previous studies [Fonfara 2012] and critical literature research (see Figure).



The impact of company internationalisation maturity on competitive advantage (network perspective)

#### 4.1. The character of the internationalisation process

The first main component of company internationalisation maturity is the character of the internationalisation process. It consists of three specific components, namely:

- the time advancement of the internationalisation process,
- the advancement level of internationalisation forms,
- the formalisation level of the internationalisation process.

The time advancement of the internationalisation process should have a positive impact on a company's competitive advantage. Greater experience

and knowledge gained through operating in foreign markets can be helpful in achieving better results than those of one's competitors. As experience and knowledge are often gained gradually, they tend to take a long time [Karasiewicz 2013]. Longer involvement of a company in activity on foreign markets allows to generally develop long-term and stable business relationships, often reinforced by informal contacts. Long-term business relationships create conditions for a better understanding of the needs of the buyer and its behaviour in different business situations. This allows better adjustment of the offer to its requirements [Deszczyński 2016]. The longer international activities of a company contribute to the development of relations with other important actors such as suppliers, competitors or influential entities.

Therefore, the longer a company participates in the internationalisation process, the more likely it is to achieve relatively better results than those of its closest competitors. Taking into consideration the development of a company's internationalisation process in time, we can distinguish its four possible phases [Fonfara 2012]:

- initiation [1–2 years],
- constant development [3–5 years],
- advanced development [6–10 years],
- maturity [more than 10 years].

With reference to the specific component discussed here, it is assumed that the greater the company's time advancement of the internationalisation process, the greater the likelihood of it achieving a competitive advantage over the closest competitors.

Companies use various forms of internationalisation when operating in foreign markets. They usually engage in indirect export, direct export, the sale of a license, and foreign direct investment [Witek-Hajduk 2010; Rymarczyk 2004]. In many cases, the company initiates the internationalisation process with relatively simple forms of internationalisation, replacing them later with more advanced ones. Some of them are used because of the specificity of the product that is traded internationally (e.g. the sale of services usually requires making foreign direct investment). Very often, however, the choice of a particular form of internationalisation results from the company's potential and expectations regarding the benefits of international trade. It can be assumed, therefore, that some forms of internationalisation (e.g. indirect export) are relatively easy to achieve, while others (eg, foreign direct investment) require large capital and often involve high risk. A company's involvement in relatively more advanced forms of internationalisation (those requiring greater capital and intellectual resources) may result from its efforts to derive greater benefits and to strengthen its position in relation to competitors.

The choice of a particular form of internationalisation affects the possibility of forming business relationships with various actors in the process of internationalisation. For example, indirect export usually comes down to contact of a company with

an intermediary. Often the relationship between the parties in this case is dominated by an agent (importer), and the dependence of a company on the importer reduces its decisiveness and exposes to a sudden breaking of contact (e.g. within subcontracting). More opportunities to develop long-term and stable relationship are provided to a company by direct exporting in the process of internationalisation, especially when we sell products under own brand. In turn, a company using FDI in the process of internationalisation and having production branches and / or selling branches in foreign markets has the potential to work more closely with various entities localized in these markets and form closer and more enduring business relationships. This makes it possible in particular to better meet the needs of customers, and significantly increase the efficiency of a company.

It can be assumed, therefore, that the higher the advancement level of internationalisation forms in the company internationalisation process, the greater the likelihood of it achieving a competitive advantage over the closest competitors. In practice, a company can use various forms of internationalisation in different foreign markets. When assessing the advancement level of a company's internationalisation forms, we should identify and indicate the relatively highest form of internationalisation used by the entity under investigation.

The last specific component of the character of the internationalisation process is the formalisation level of the internationalisation process. A formal process of internationalisation means that the internationalisation process is formally developed and adopted by the company in its strategic and operational plans [Fonfara 2007]. It is assumed that internationalisation related decisions (including why, where, when and how to enter overseas markets) are based on formally conducted studies and on analyses of potential overseas markets. In practice, a company's internationalisation process may also be spontaneous [Fonfara 2007]. In such cases it develops on an ad hoc basis, often when an opportunity happens to present itself. In such cases, there are no formal analyses of foreign markets; instead, informal sources of information on foreign markets predominate. Additionally, a spontaneous process of company internationalisation often features many subjective internationalisation-related decisions dependent on the personal, subjective preferences of the company's decision makers and on their temperament. To a large extent, a decision-making process makes use of informal relations [Kadushin 2012].

The formalization of the process of internationalisation promotes the formation of business relationships with various entities in accordance with the strategic objectives of the company. It also means the possibility of allocation of corporate resources needed to initiate, sustain and develop some business relationships. This should affect their durability and long-term development. In case of formalization of the process of internationalisation actions are observed, which may be called relationship management. They rely on the analysis of individual business relationships and decision-making relating to their optimal structure from the point

of view of the strategic objectives of the company (strengthening/elimination of certain relationships). It is worth noting that the formalization does not preclude the development of informal contacts between the company and the different actors in the process of internationalisation.

In case of the spontaneous nature of the process of internationalisation, the structure and the number of business relationships arises from the ongoing, sometimes random decisions. Lack of in-depth assessment of the development of business relationships in subject and market terms (with which entities to cooperate and why, which foreign markets to enter and why) may influence their limited durability. The result is relatively frequent changes in the structure and the number of business relationships. Establishing new relationships requires investing in their development, which negatively affects the performance of the company. This is not compensated by extensive informal contacts developed at all stages of the process of internationalisation of the company, which often in this case are the impetus for the creation of new business relationships.

In practice, we can observe different formalisation levels of the internationalisation process, namely:

- a spontaneous character of the internationalisation process,
- a spontaneous character with elements of formalisation (ordering selected activities in overseas markets in short-term plans),
- formalisation of the internationalisation process by designing and developing it in the company's strategic plans.

Previous studies have pointed to a definitely positive impact of internationalisation process formalisation on company performance [Fonfara 2009; 2012]. Hence, it can be assumed that the higher the formalisation level of a company's internationalisation process, the greater the likelihood of it gaining a competitive advantage over the closest competitors.

#### 4.2. The nature of cooperation in the internationalisation process

The second main component of company internationalisation maturity is the nature of cooperation in the internationalisation process. The assumption is that it consists of four specific components, namely:

- openness to cooperation,
- the level of trust as part of cooperation,
- the scope of conflicts as part of cooperation,
- psychological distance.

Openness to cooperation involves accepting cooperation in the internationalisation process as an essential part of a company's business activity, making sustained efforts (often based on formal studies) to find cooperation partners, and opting to operate in foreign markets which require cooperation with domestic and foreign

entities. On the other hand, closedness to cooperation in the internationalisation process means attempting to operate by oneself. There may be various reasons for a company adopting such an approach to overseas operations. Most often, a company's closedness to cooperation is due to a fear of losing independence, the risk of potential partners acquiring important trade and industrial secrets, and the lack of competence in dealing with foreign entities [unfamiliarity with overseas markets, inadequate communication skills]. Research conducted by one of the present authors [Fonfara 2009; 2012] demonstrates that, in practice, companies that close themselves to cooperation do quite well as they conduct by themselves most of their activities in foreign markets. Most often, however, it is companies open to cooperation that achieve success in foreign markets and gain a competitive advantage over their closest competitors [Yip and Bink 2007].

Openness to cooperation has a positive effect on the process of creating business relationships, both at the stage of initiation, and later in the course of their further development. Openness to cooperation means a willingness to share knowledge and other important resources of the company with independent entities. Significant stress is put on mutuality of openness in relationships [Miozzo and Grimshaw 2006]. It is suggested that mutual openness is indispensable in order to join resources and complement competencies. In this case it is also necessary to establish trust. A large number of external relationships, co-creating value with other entities, as well as specialization has a positive effect on company performance. However, it forces the need for professional management of a large number of relationships with independent entities, which in practice can be a challenge and limitation for many businesses. Closedness to cooperation obviously limits the possibility of the development of business relationships with entities in the company's environment, in particular sub-suppliers, subcontractors and competitors. In this case, the relationships with independent entities are a result of emergency and are not seen by the company as an important condition for development of competitive advantage. The closing of a company to the entities in the environment is compensated by very extensive internal relationships with entities formally dependent on it.

Hypothetically, we can distinguish the following levels of openness to cooperation on a five-point scale:

- a definitely full openness to cooperation,
- openness to cooperation,
- partially closing oneself to cooperation,
- closing oneself to cooperation,
- definitely closing oneself to cooperation.

With reference to the specific component discussed here, it is assumed that the greater the degree of a company's openness to cooperation in the internationalisation process, the more likely the company is to achieve a competitive advantage over its closest rivals.

In the network approach, trust as part of cooperation constitutes a key aspect of an analysis of the relationship between entities. Trust is defined as the belief that the other party will perform actions that will produce positive results and will not unexpectedly do things that may adversely affect the relationship between the entities examined [Małys 2013]. In practice, trust means that our partner is able to meet the conditions of a contract and will not undermine the existing partnership to gain some short-term benefits. Trust, therefore, is a guarantee that an agreement between parties will not be unilaterally broken, and that unforeseen problems will always be resolved to the satisfaction of both parties. It is expected, therefore, that a high level of trust as part of cooperation has a positive effect on company performance. Consequently, it can be assumed that the higher the level of trust as part of cooperation in the internationalisation process, the greater the likelihood of achieving a competitive advantage over the closest rivals. Conflict is the next specific component of the nature of cooperation in the internationalisation process. The occurrence of conflicts is intrinsically linked to the development of relationships between independent entities [Håkansson et al. 2009]. Naturally, conflicts occur also within internal business networks, between entities that are, from the legal and formal point of view, part of the same organizational structure. Conflicts may arise from expectations that are too high for cooperating entities, or be related to product quality, the speed of delivery of goods, etc. They may also be associated with the “selfish” behaviour of partners who, in an attempt to reap short-term benefits, cause inconvenience such as 15 additional costs for other cooperating entities [Ford, Håkansson and Johanson 1997]. Conflicts do not always have an adverse effect on relations as part of cooperation. It is emphasised that they may be a source of innovation and further development, especially if they are resolved constructively [Gössling, Oerlemans and Jansen 2007]. This is why the influence of conflicts as part of cooperation on company performance should always be thoroughly analysed. It can be assumed, therefore, that the smaller the number of conflicts, or the more constructive the conflict resolution, the greater the likelihood of achieving a competitive advantage over rivals.

Psychological distance is the last of the investigated specific components of the nature of cooperation in the internationalisation process. Psychological distance is most often interpreted as a set of factors that make it difficult for a company to operate in a foreign environment [Hallén and Wiedersheim-Paul 1993]. The factors include differences in the development of particular countries, a different business environment, a different level of education and, finally, language differences. According to the concept of psychological distance, the smaller the psychological distance, the greater the inclination to establish business relationships between entities from different countries. The concept was used in the Uppsala 1977 model by Johanson and Vahlne [1977] in order to describe the process of internationalisation. Owing to such things as universal globalisation and ease of communication,

the role of psychological distance as a basis for decision-making at the company level seems to have decreased. Today's research results indicate, however, that psychological distance continues to play a significant role in decisions taken at various levels of company management by people who have varying levels of knowledge about the foreign environment and, consequently, deal with psychological distance more or less successfully [Johanson and Vahlne 2009]. The concept discussed in the present paper is based on the assumption that psychological distance has an impact on the relationship between entities in the internationalisation process. It can sour the relationship and adversely affect cooperation, which in turn may translate into a company's poorer market and financial performance. Therefore, the smaller the psychological distance, the greater the likelihood of a company achieving a competitive advantage over its closest rivals.

#### 4.3. The scope of cooperation in the internationalisation process

According to the conceptual framework, the third major component of company internationalisation maturity is the scope of cooperation in the internationalisation process. For many years, entity-focused research into cooperation analysed mainly the relationship between seller and buyer [Anderson, Häkansson and Johanson 1997]. More recent studies have demonstrated that the effectiveness of a company, including in an overseas market, depends not just on its cooperation with the buyer. Achieving a company's objectives requires that it should establish relationships and cooperation with entities such as, among others, suppliers, competitors, or referral and influential entities [Peck et al. 1999; Wuyts, Van de Bulte 2012]. The concept presented here assumes that cooperation in the internationalisation process takes place not only with external entities, ones that are independent of a given company in a formal and legal sense. Because of the extensive organizational structure of many large companies, a significant part of cooperation in the internationalisation process is conducted within an internal business network. In such a situation, relationships concern entities which are subsidiary in formal terms, but which often carry out business activities at least partially independent of the headquarters. Therefore, the analysis of a company's cooperation in the internationalisation process should concern both its external network and its internal relationships with selected entities [Ahmed and Rafiq 2002; Cropper et al. 2010]; it is a consequence of today's phenomena of externalisation and internalisation of the internationalisation process [Fonfara 2014].

As part of the concept of company internationalisation maturity, we take into consideration a company's relationships with both external and internal entities. The significance of these relationships in terms of their impact on competitive advantage varies between different companies. In particular, in the case of smaller



companies, relations with external-environment entities will definitely be more important. This results from these entities' not-very-complex internal organizational structure. On the basis of previous research [Małys 2013], it is assumed that in the external environment, owing to their importance, we should take into consideration buyers, suppliers, competitors and influential entities. The buyers may be institutional entities and individual consumers. As part of internal relationships, in turn, internal buyers and suppliers will be considered. In practice, the significance of particular external and internal entities is dependent, among other things, on the industry, company size, and the intensity of competition. Hence, in the case of the specific component which is the scope of cooperation in the internationalisation process, it is assumed that a range of cooperating entities commensurate with the significance of external-environment entities and to the significance of internal entities has a positive effect on the level of a company's competitive advantage. This is because a company should focus on the relationships with those entities which have the greatest impact on its effectiveness, and therefore on its market and financial performance.

## Conclusions and future research

Considerations presented in the paper are conceptual and their aim is to provide a method for the evaluation of the company internationalisation process from the perspective of network approach. It is based on the concept proposed by the authors of the company maturity in terms of internationalisation. It includes a number of components influencing the formation of competitive advantage.

Components of company maturity in terms of internationalisation, referring to the network approach, were originally proposed by the authors on the basis of their earlier research and the latest subject literature supported by discussions with business practitioners. As it was mentioned before this preliminary set of components was verified (within the qualitative research) by in-depth interview in 10 companies of various sizes representing different industries. As a result of this verification 9 out of 12 originally proposed components of company internationalisation maturity become an object of further investigations. 3 deleted components turned out to have rather a weak influence on company performance or they were too complex and interconnected with other components (for instance atmosphere of business relationships).

The qualitative research was followed by mentioned before quantitative studies. Their purpose was to collect data that would enable us to comprehensively test the adopted system of evaluating the internationalisation process using the concept of

company internationalisation maturity. Quantitative studies based on questionnaire survey sent to a group of companies located in Poland and involved in international business. The sampling frame was constructed based on the Kompas Poland database and design to be broadly representative of industry categories, firm sizes and ownership types. The sample was selected at random. The questionnaires were sent to 1900 companies by mail. Due to logistics problems (unknown addresses, liquidated companies) the questionnaire reached 1748 companies. It gives a response rate of 10,2% and provides a sufficient base for testing the propositions.

Analysis of the results of qualitative research has initially confirmed the importance and relevance of all the components of company maturity in terms of internationalisation in the context of the development of competitive advantage and the impact on the company's performance in the process of internationalisation.

The result of the quantitative studies should allow more precisely and objectively to determine the relative significance of particular components in company competitive advantage development. This may provide a basis for creating a consolidated maturity aggregate that will take into account the varying impact of particular components on company performance, which should be helpful in studying and understanding the company internationalisation process.

Past results of authors' research are conducive to making an attempt at development of scales within the above mentioned consolidated maturity aggregate. This will enable the operationalization of the concept of maturity in terms of internationalisation and its use both for further research and for the assessment of the internationalisation process of a selected company.

Testing an operationalized concept of company maturity in terms of internationalisation is planned for the beginning of 2016. It will be based on case-study in 30 companies in combination with participant observation and in-depth interview, SNA and Network Picture. The purpose of the analysis will be to comprehensively diagnose the mechanism determining competitive advantage in the internationalisation process with the use of a previously developed system of identifying a company's level of internationalisation maturity.

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Katarzyna Appelt<sup>1</sup>

## Is economics a science? On scientific cognition in social sciences, in economics in particular

### Introduction

The title of the article refers to a dilemma which has recently been addressed exhaustively in Polish economic literature by prof. Zbigniew Czerwiński. In his paper entitled *Is economics a science?* [1996] Z. Czerwiński argued that as a nomological science economics does not formulate laws which are simultaneously universal and exact in character. Complex – that is peculiar by nature – economics is nowhere to be found in the hierarchy of sciences proposed by Auguste Comte. In light of the above dilemmas the author of the article brings the reader's attention to the work of Carl Menger entitled *Untersuchungen über die Methode der Socialwissenschaften und der Politischen Oekonomie insbesondere* [1883]. In this work, Menger highlighted the importance of theoretical cognition in science, particularly in social sciences. Menger's philosophy sheds a different light on the manner in which truth is being discovered in science and, hence, provides a direct reference to the dilemma addressed in the topic. Despite the passage of time, the work of Carl Menger from 1883 is little-known, both at home and abroad (the work entitled *Grundsätze der Volkswirtschaftslehre*, in which the author put forward the basic principles of the subjective theory of value, enjoys a relatively greater interest). The author of this paper attempts to set out the philosophy of science put forward by Carl Menger, including the methods of scientific cognition, and finally readdresses the question posed by Z. Czerwiński.

The article consists of four parts. Part one refers to the theses presented by Z. Czerwiński in the article *Is economics a science?* Parts two and three concern the methods of scientific cognition in social sciences introduced by C. Menger in the dissertation *Untersuchungen über die Methode der Socialwissenschaften und der Politischen Oekonomie insbesondere*. Part two presents Menger's typology of resource allocation sciences with reference to the division of the phenomena into

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two classes, i.e. individual and general ones. Part three describes two directions of theoretical research, and indicates their significance in explicating the phenomena occurring in the field of resource allocation processes. The last part contains the summary along with the key conclusions.

## 1. Economics in Auguste Comte's system of sciences

The point of departure for Z. Czerwiński's deliberations addressed in an article entitled *Is economics a science* is a classification of sciences proposed by Auguste Comte (1798–1857). Comte established a hierarchy of sciences with mathematics coming as the first – the most general, and sociology as the last – the most complex. Sciences at the beginning of that hierarchy rest upon the laws of the sciences that they are preceded by in the sequence (physics depends on the laws of mathematics, biology – on the laws of physics, chemistry etc.). Comte's classification implies a certain unity of science. Scientific laws are expressible in the language of mathematics. They are universal and exact. Hence, discovered laws become the foundation for predicting the future course of events. The postulate of the quantification of science plays an important role in Comte's approach (regardless of their position in the hierarchy of sciences). It enhances the practical application of the law discovered. Natural sciences, i.e. physics, remain to serve as a model for each scientific discipline.

Czerwiński argues that scientific statements put forward by economists do not have the expected attributes, i.e. universality and exactness. They allow exceptions and are dependent of time and place. When attempts are made to formulate them as scientific laws, they cease to be exact<sup>2</sup> or become banal<sup>3</sup>. Attempts at a precise formulation of laws strips them of their universal character<sup>4</sup>. An economist is constantly faced with intractable dilemmas: the formulation of statements which are either true, but too general to be of practical value, or such statements that are true only within narrow temporal and spatial constraints; or such that are true only *ceteris paribus*, and – if taken literally – simply false, or statements rigorously deduced from the assumptions remaining loosely linked with economic reality. Therefore, the cognitive and practical role of statements referred to as economic laws seems

<sup>2</sup> Exactness is attributed to the fact that the relationship that a law describes is quantitative in character and expressed using the language of mathematics [Czerwiński 1996, p. 7].

<sup>3</sup> Czerwiński adds yet another scientific attribute to the scientific laws, i.e. the non-banality of the statements that are being put forward. Universal character, exactness and non-banality are regarded as essential features of scientific laws [Czerwiński 1996, p. 7].

<sup>4</sup> We can ensure that a law can be universal provided that it is formulated in very general terms. This happens (in economics – ed.) at the cost of exactness, which deprives or at least reduces the law of practical meaning [Czerwiński 1996, p. 9].

to be negligible. The statements formulated by economists do not constitute a basis for predicting the future course of events. There is no law in economics that would be modelled on the laws which are discovered by natural sciences – the author concludes<sup>5</sup>. Economics does not fit within the positivist conception of science. Hence, the effort put in by economists, although merits recognition, does not yield expected results.

Czerwiński points to the particular complexity of the issues investigated by economics, different from the complexity of the subject matter of research in natural sciences. Economics explores the behaviour of man. Man has the ability to set goals and take action which he believes will bring those goals within his reach<sup>6</sup>. In view of the above, consideration should be always given to the peculiar character (distinctness) of economics. Czerwiński advocates (recognizes the legitimacy of) the deductive method in resource allocation sciences. He argues at the same time, however, that the a priori assumptions of deductive method idealize the behaviour of real entities. Moreover, he maintains that the deductive method does not solve a fundamental problem of modern economics, namely a small extent to which the statements are useful for diagnosing and forecasting economic processes. In this sense, economics does not meet the contemporary expectations of the society, namely an unambiguous explanation of economic processes and bringing them under control<sup>7</sup>.

## 2. Carl Menger's typology of resource allocation sciences

A different approach to science, including resource allocation sciences was initiated by Carl Menger (1840–1921). Carl Menger distinguished two major disciplines in this area:

- historical sciences (Ger. *historische Wissenschaften*),
- theoretical economics (Ger. *die theoretische Volkswirtschaftslehre*; Ger. *die theoretische Nationalökonomie*).

The division of resource allocation sciences into two sub-disciplines is a natural consequence of the co-existence of two classes of phenomena:

<sup>5</sup> Economic statements do not resemble the laws of natural sciences, e.g. Archimedes' principle, the second principle of dynamics and the law of gravity.

<sup>6</sup> All this together just leads to the fact that two individuals or social organizations (companies, banks, governments) operating under the same conditions may respond to them differently, which results in the lack of universal and exact laws corresponding to the laws created by the natural sciences [Czerwiński 1996, p. 13].

<sup>7</sup> If there were universal and exact economic laws, they could be used as the foundations of deductive theories, but their absence is indicative of a great arbitrariness of theories, thus constant disputes among economists – theorists (...) [(Czerwiński 1996, p. 10)].



- individual (isolated) phenomena (Ger. *die individuelle Erscheinungen, die concrete Phänomene*),
- general (recurring) phenomena (Ger. *generelle Erscheinungen*).

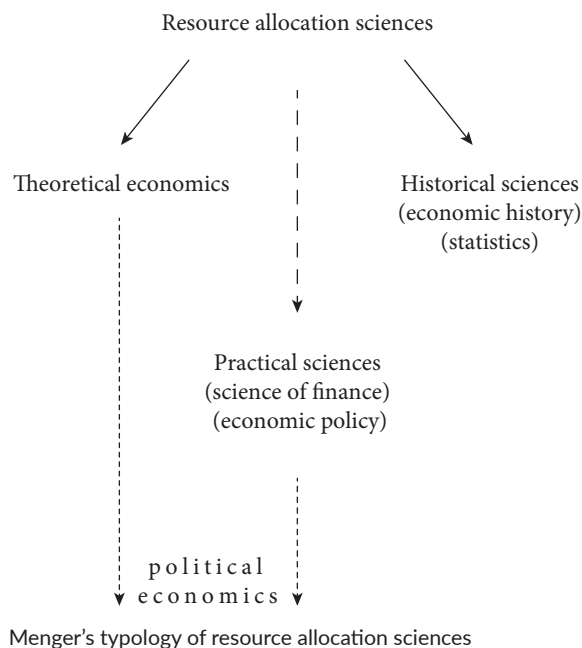
The classes of the phenomena vary in character, which is why we employ various methods of their cognition. We get to know individual phenomena from a historical perspective (Ger. *durch ihre Geschichte; in spezifisch historischer Weise*), i.e. by examining their process of development (emergence) in relation to time and place (Ger. *Werdeprocess erforschen*). The examples of individual phenomena include, among others, a legal system in force in a given country or the language spoken by a given nation. In the area of resource allocation sciences, individual phenomena are described by historical sciences, i.e. economic history and statistics. There are certain phenomena, however, which we discover through theory. These include the phenomena which validate a certain regularity of events, namely their succession (Ger. *ein specieller Fall einer gewissen Regelmässigkeit (Gesetzmassigkeit) in der Aufeinanderfolge*). In view of the recurrence of general phenomena, their investigation consists in identifying the general forms of phenomena and typical relations, which will be further referred to as the laws of phenomena. The identification of the forms and laws of events enables us to identify the cause underlying their occurrence.

In the area of resource allocation sciences the study of general phenomena is the domain of theoretical economics. As is the case with other fields of science, this study has a dual character, i.e. it includes two stages and boils down to determining:

- forms (types) of phenomena (Ger. *die Erscheinungsformen; Ger. die Typen der Erscheinungen*),
- laws of phenomena (Ger. *Gesetze der Erscheinungen; Ger. typische Relationen der Erscheinungen*).

The identification of the forms (types) of events enables the comprehending and organization of the phenomena under observation. It is the first step in research. Sample forms (types) of phenomena include, among others, the concept of money, supply, demand, price or interest. General phenomena (in contrast to individual phenomena) tend to recur with a lower or higher degree of regularity. The objective of economics as a theoretical science is to identify the laws (relations) (Ger. *wiederkehrende Relationen*) which govern a given phenomenon, e.g. the phenomenon of price drop, growth in the value of money or interest rate change. By identifying the essence of these relations we recognize the causes of its occurrence.

Menger distinguishes yet another area of research in resource allocation sciences, i.e. the so-called practical sciences (Ger. *die praktischen Wissenschaften*), which are neither theoretical nor historical sciences. Practical sciences are an area which pertains to the theory of arts (Ger. *die Kunstlehren*). This branch of science includes economic policy (Ger. *die Volkswirtschaftspolitik*), and the science of finance (Ger. *die Finanzwissenschaft*).



In his treatise entitled *Untersuchungen über die Methode der Socialwissenschaften und der politischen Oekonomie insbesondere* Menger brings the reader's attention to a problem which has far-reaching methodological consequences, namely the misidentification of the essence of economics (Ger. *Verkennung der formalen Natur der theoretischen Ökonomie*) and treating it as a historical science, which results in underestimating the theoretical, i.e. formal character of economics. If we assume that economics is a historical science, we lose sight of economic theory – an area which investigates general phenomena. Historical cognition cannot replace theoretical cognition – proves Menger. Historical sciences teach us how to identify (describe the state of) isolated (individual) phenomena e.g. the size of a country's economy. Theoretical economics helps us to grasp the nature of recurring phenomena, which enables us to understand a given phenomenon, explain its causes and predict future events. A full identification (comprehension) of general phenomena implies identifying a pattern behind events (Ger. *das geistige Abbild*) and explaining their causes (Ger. *der Grund ihres Seins*). Theoretical and historical sciences differ fundamentally. Only an in-depth identification of the nature of the two disciplines is a prerequisite for the correct i.e. holistic description of the reality under investigation<sup>8</sup>.

<sup>8</sup> Historical sciences provide knowledge, which complements theoretical knowledge [Menger 2005, p. 13].

Carl Menger warns also against treating economics as a science which explores natural laws (Ger. *Naturgesetze*), that is exact laws which allow no exceptions. Economics examines complex phenomena. The phenomena related to the scarce resource allocation processes do recur, yet their recurrence is non-exact. The fact that certain phenomena cannot be described accurately does not imply that these phenomena cannot be investigated in a scientific (theoretical) manner.

### 3. On two directions of theoretical research in science, particularly in economics

Menger argues that we come to understand the complex reality of the phenomena through theoretical cognition. Theoretical cognition organizes the totality of events into definite forms, and subsequently discovers the reason behind the succession of events and their co-existence. Solving a scientific problem comes down to investigating the types of phenomena and identifying typical (specific, definite) relationships between events. Menger notes that there are two directions through which we follow to arrive at scientific cognition, which should refer to two independent directions of research:

- a) realistic-empirical direction of research on phenomena (Ger. *die realistisch-empirische Richtung der theoretischen Forschung*<sup>9</sup>);
- b) exact direction of research on phenomena (Ger. *die exacte Richtung der theoretischen Forschung*).

The realistic-empirical direction of research assumes that phenomena recur with a certain regularity, but exceptions are allowed. The strive for capturing the entire complexity of “empirical reality” (Ger. *die empirische Wirklichkeit*) in the confines of exact laws is an unattainable goal of science. The realistic-empirical direction of theoretical research identifies real types (Ger. *Realtypen*) and empirical laws (Ger. *empirische Gesetze*), i.e. the laws of succession of real phenomena provided that these laws are not exact, that is they allow exceptions. Although that direction of research gives us knowledge about a phenomenon and the understanding of it, neither this knowledge nor understanding is comprehensive or perfect. Menger argues that realistic-empirical orientation is vindicated (justified) in almost all the phenomena which are the subject of scientific inquiry, including natural phenomena<sup>10</sup>. Hardly ever do natural phenomena represent pure forms of events, i.e. the

<sup>9</sup> Carl Menger interchangeably introduces the term *empirical and realistic direction of theoretical research* (Ger. *die empirisch-realistische Richtung der theoretischen Forschung*).

<sup>10</sup> Die empirisch-realistische Richtung der theoretischen Forschung gilt auf allen Gebieten der Erscheinungswelt [Menger 2005, p. 37].

laws of phenomena which are manifested without exception. Natural sciences, i.e. physiology and meteorology essentially identify real types and empirical laws<sup>11</sup>. The diversity of phenomena accounts for a significant variance in the results of the realistic-empirical research. The variances, however, are incremental<sup>12</sup>.

The direction of research referred to as theoretical – exact seeks and explores in depth the simplest i.e. indivisible elements of events. It identifies the most elementary forms of events, arriving at what is the most typical, the most specific for a given event<sup>13</sup>. Thus determined forms of events provide the grounds on which the laws of phenomena (Ger. *exacte Gesetze*) are built. These laws are not laws of real (actual) events, but the laws of phenomena with forms which are strictly defined in qualitative terms. In consideration of the above it should be noted that the statements of both directions differ in their approach to empirical reality. Exact orientation statements are not vindicated directly in the phenomena under observation. They are not empirically verifiable. Although related to real phenomena, they are not their projections. In view of the above, the verification of the achievements of theoretical investigation through empirical research is a methodological error (Ger. *methodischer Widersinn*), and seeking vindication for exact laws in resource allocation in empirical knowledge is tantamount to underestimating (misconstruing) the methodical foundations of this direction<sup>14</sup>. The realistic-empirical direction of theoretical research refers to the phenomena in their full empirical reality and complexity. The validity of economic laws in the empirical direction is verified by each and every empirical (real) phenomenon. We arrive at theoretical cognition of phenomena in natural and social sciences by following both the empirical-realistic and exact law directions. The more complex is the area in which phenomena occur, the greater the challenge faced by theoretical research direction, in particular by exact direction of research. The identification of the simplest elements of phenomena becomes highly problematic, yet it has no bearing on the principle which says that both the directions are equally grounded, irrespective of the complexity of the phenomena under study<sup>15</sup>.

<sup>11</sup> Auch die Naturerscheinungen bieten uns nämlich in ihrer „empirischen Wirklichkeit“ weder strenge Typen noch auch streng typische Relationen dar (...) [Menger 2005, p. 37].

<sup>12</sup> Alle diese Unterschiede sind jedoch in Rücksicht auf die Voraussicht und die Beherrschung der Erscheinungen nur gradueller nicht prinzipieller Natur [Menger 2005, p. 28].

<sup>13</sup> This approach is significantly different from the empirical induction adopted by Bacon [Menger 2005, p. 41].

<sup>14</sup> Menger notes that the process of validating (the compliance) the results of theoretical research with empirical knowledge is similar to the action of a mathematician who validates the laws of geometry by measuring real objects existing in the world without stating previously that the realness of events is not superordinate to, but different from [Menger 2005, p. 54].

<sup>15</sup> Im Prinzip jedoch sind beide Richtungen der Forschung nicht nur allen Gebieten der Erscheinungswelt, sondern auch allen Stufen der Complication der Phänomene adäquat [Menger 2005, p. 53].

It is assumed that theoretical cognition in the exact direction guarantees the veracity of scientific statements to a relatively lesser extent than empirical direction, which 'draws on experience', i.e. refers to empirical events. Moreover, if the results of research in the two directions are contradictory, the achievements of research in exact direction should take into account the results of research in empirical direction as being closer to the truth, methodically subordinate to the empirical direction. The reason behind this error is misconstruing (underestimating) the methodical foundations of exact direction of research. The realistic-empirical and exact directions of theoretical research seek to explain the essence of the laws of the succession of events, and to identify them. Although the results (achievements) of research in analysed directions differ in their character, the scientific explanation of the essence and the causes underlying the phenomena should take into account both the real types of empirical direction, and elementary forms of phenomena in the exact direction<sup>16</sup>. The incorporation of the achievements of the two directions of theoretical investigation in many areas of research, in that in research into the phenomena, which occur in resource allocation processes (e.g. the phenomenon of price, the value of interest) is a precondition for capturing (understanding) the essence of events. Both the so-called realistic-empirical direction of research and the exact direction are welcome in economics. Both the directions constitute the tools for explaining the essence of resource allocation phenomena. They share the same objective. They seek to theoretically explain the socio-economic events.

Carl Menger argues that economics as a theoretical science formulates empirical laws, i.e. it identifies real types and empirical laws. It also employs the general character of the postulates put forward by the exact direction of research. The distinctness of the said laws, i.e. their specific character is due to the area of the phenomena under investigation. Resource allocation includes all the activities taken by people with a view to satisfying their needs. The exact direction of research must by necessity examine preliminary, the most elementary factors of resource allocation, which evolve into complex allocation process (Ger. *die Erforschung der ursprünglichsten, der elementarsten Factoren der menschlichen Wirthschaft*). The first (primary) factor lying at the heart of resource allocation are the needs and the desire to satisfy them. The point of departure and the objective of resource allocation is given to man a priori, defined and determined. The laws in economics are not universal and exact within the meaning of natural laws. Economics uses empirical or exact laws from the area of ethics<sup>17</sup>.

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<sup>16</sup> In der wissenschaftliche Darstellung werden indess die exacten und realistischen Erkenntnisse nur selten getrennt behandelt [Menger 2005, p. 50].

<sup>17</sup> Die Gesetze der theoretischen Nationalökonomie sind in Wahrheit niemals Naturgesetze in eigentlichen Verstande des Wortes, sie können vielmehr nur empirische oder exacte Gesetze der ethischen Welt sein [Menger 2005, p. 39].

## Conclusions

The contemporary system of science refers to the system proposed by A. Comte. Comte assumed that all scientific disciplines can be arranged into a system (the so-called Comte's hierarchy of the sciences), in which various disciplines of science are linked through the language of mathematics.

Z. Czerwiński [1996] noted that economics does not fit within the positivist concept of science. Although classified as a nomological science, economics does not formulate laws commonly known as laws of science or scientific laws. Due to the complexity of the phenomena associated with resource allocation processes, economic laws are not exact and universal, and as such cannot provide the grounds for forecasting economic events. Therefore, economics defies the concept of science put forward by A. Comte. Moreover, it negates the unity of science assumed by Comte.

In *Untersuchungen über die Methode der Socialwissenschaften und der Politischen Oekonomie insbesondere* (1883) C. Menger presented a different approach to science. The point of departure for Menger's analysis is not science understood as a system of scientific disciplines, but rather as the entirety of phenomena which we observe and experience. Menger divided the phenomena into two categories, i.e. individual (isolated) and general (recurring). These classes of phenomena vary in their character, which is why various methods of cognition are put to use. We come to know individual phenomena by examining their individual i.e. time – and place-related process of development. We get to know general phenomena in a theoretical manner, i.e. by identifying general forms of phenomena and typical relations which can be described as laws of phenomena. By comprehension the essence of these relations we recognize the causes of their occurrence. In resource allocation sciences, economics is involved in the investigation of recurring phenomena, while economic history and statistics examine individual phenomena.

General phenomena are examined in two ways, i.e. by recognizing elementary forms (exact direction of research) and by formulating real types and empirical laws (realistic – empirical direction of research). Both directions formulate scientific laws independently of each other, they are disjunctive and neither direction is superordinate or subordinate to the other one. Menger's approach points to the deductive dimension of science in general and economics in particular. The investigation of general phenomena is always theoretical by nature, and should include examining elementary forms of phenomena anchored in value standards. Therefore, Comte's thesis that social sciences build their scientific laws empirically (non-theoretically) and draw conclusions from these laws about the nature of (the activities of) man is vague for C. Menger. Theoretical cognition is cognition which equips us with knowledge that cannot be acquired by way of empirical induction.

Carl Menger points the reader's attention to two common errors made by economists, i.e. treating economics as a science which investigates natural laws, i.e. the laws which allow no exceptions, and treating economics as a historical science. Historical sciences teach us to identify individual phenomena. Economics as a theoretical science examines general phenomena which are recurrent in nature. Historical and theoretical sciences prove fundamental differences. The objective of economics as a theoretical science is to identify the laws of phenomena. Historical cognition cannot replace theoretical cognition.

The conclusions which follow from Carl Menger's work provide an answer to the dilemma which puzzles contemporary economists. Economics is a science, because it investigates general phenomena. The fact that certain phenomena cannot be described in an exact manner does not imply that they cannot be investigated in a scientific way. The investigation of phenomena comes down to identifying elementary forms of phenomena as well as real types and empirical laws. The world of phenomena which we observe and experience, in particular the realm of social events, vindicates the existence of laws (i.e. the recurrence of phenomena). We cannot assume, however, that the laws occur always, without any exceptions. Keeping the above in mind, there are two ways to fully identify and understand the phenomena through theoretical cognition. We aim to explore in depth the smallest (the most typical) elements of events with a view to determining qualitative forms of events, developing simultaneously real types and empirical laws.

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# Exploring Changes in the Potential for International Trade



Tomasz Rynarzewski<sup>1</sup>, Ewa Cieřlik<sup>1</sup>, Katarzyna Nawrot<sup>1</sup>

## The use of the economic potential of the African continent by Polish entrepreneurs: selected aspects of mutual cooperation on the example of regions of West and East Africa<sup>2</sup>

### Introduction

African markets encounter a growing interest from the developed countries, including Poland. As expected, despite the awareness of the major challenges and developmental threats facing African countries, in the coming decades Africa will remain on the path of rapid growth, which will increase its importance in the global economy. Polish entrepreneurs have seen the enormous potential of the continent, but they are still exploiting it insufficiently. Trade cooperation and capital flows between Poland and Africa remain marginal as compared to increased trade and intense capital flows between our country and Europe. However, a dynamic development of the Polish-African economic relations may be expected in the coming years.

The aim of this article is to present the current state of Polish economic cooperation with selected countries in West and East Africa. Its implementation takes place in the broader context of the opportunities and risks to development processes of African countries. The first part of the article defines the possible barriers and opportunities, and on their basis the perspectives of the future development of this group of countries. Part two focuses the discussion on the characterization of the economies of West and East Africa in terms of their economic potential. Part three of the article presents trade and investment flows between Poland and its selected partners from these two regions in the years 1994–2013. The article assumes the division of Africa into regions as developed by the United Nations.

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## 1. Opportunities and threats to development of African countries

### 1.1. Opportunities to enhance the growth

In the last 15 years, the African continent has recorded an exceptionally high average GDP growth rate in excess of 5%, which differed significantly from the value of this indicator for the entire global economy. In the years 2001–2013 African countries (excluding North Africa) reached a growth rate of GDP per capita by 0.6 basis points compared with the 0.3 points of growth in Asian countries provided as an example of a very high growth rate [MDG 2015, p. xiii]. In selected recent years, the annual GDP growth rate has been as follows: 6.6% (2012), 4.8% (2013) and 5.3% (2014) [African Economic Outlook 2013, p. 7]. Some African countries with an average GDP growth rate of up to 11% are in the forefront of the fastest growing countries in the world [CEED 2013 p. 15]. The result of high growth rates was the reduction of the population on the continent living below the poverty line from 56.5% in 1990 to 48.4% in 2010 [MDG 2015, p. xiii]<sup>3</sup>.

The main impulses for economic growth in African countries are primarily the growing domestic demand, in terms of both consumption and investment determined by an increase in income of employees, intensification of credit campaigns and incoming money transfers from indigenous migrants working outside their home countries. On the supply side, the enhancement in growth dynamics in African countries is influenced by the growing volume of production of raw materials and a prominent revival of agricultural production and the development of the service sector [African Economic Outlook 2013, pp. 7–8].

With regard to relations with foreign countries, attention should be paid to the gradually increasing inflow of foreign direct investment, sustained since 2005 at the level of tens of billions of dollars a year and to official foreign financial aid for this group of countries provided in a similar amount [African Economic Outlook 2013, p. 12]. Exports of goods from African countries significantly increased in the years 2000–2011 from \$148.6 billion to \$581.8 billion, but the absolute values of exports abroad remain at a relatively low level [African Economic Outlook 2013, p. 14].

### 1.2. Real and potential threats to economic growth

African countries face a great number of barriers, which impede the maximization of their development. A multitude of threats makes the clear visions where the future decades are called “Africa time” not fully convincing.

Some of the barriers are political, historical and institutional, others are global threats to civilization of an objective nature, and others still result from the impact of the low level of development on the features of the economy.

<sup>3</sup> The percentage of the population living on less than \$1.25 a day.

The first group of threats includes political instability in the countries of Africa, the diversity of societies in cultural, religious and ethnic terms, as well as institutional weakness and underdevelopment of the broadly interpreted infrastructure. In addition, there is a huge barrier of widespread corruption, which significantly hinders both the lives of average citizens and the normal functioning of the business [Szukalski 2013, pp. 260–264].

Civilizational threats occur in African regions with particular intensity, thus often significantly determining the execution of planned development projects. These include climate change, environmental degradation, or increasingly frequent terrorist attacks [Szukalski 2013, pp. 263–264].

Barriers related to the impact of the characteristics of the low level of development on the effectiveness of the economies primarily refer to their often monocultural structure in many African countries, and despite the passing decades, the increasing petrification of raw materials specialization in exports. The high degree of concentration of exports, primarily regarding mineral or agricultural resources is one of the main reasons for the high level of fluctuations in export revenue in this group of countries [Rynarzewski 2013, p. 72]. In half of African countries, the share of exports of raw materials in total exports reaches 80% [South Centre 2005, p. 11]. High amplitude of export income fluctuations is an important determinant impeding economic growth in developing countries [for more, see: Rynarzewski 1992]. Raw material specialization of this group of countries means that due to the long-term trend of deterioration of terms of trade of unprocessed goods in relation to industrial goods, they obtain significantly lower benefits from the international division of labour compared to developed countries [Rynarzewski 2013, p. 74]. Despite the various controversies regarding the empirical confirmation of the secular deterioration in the international exchange relation of raw materials in relation to processed goods, it is reflected in the research of both UNDP for years 1960–2009 and in the results presented by UNCTAD for the years 1977–2001 [UNDP 2011, p. 63; UNCTAD 2004].

### 1.3. Prospects for the development of African countries as the basis for forming their economic potential

The future development of African countries depends on the prospective evolution of the world economy and the choice of the proper domestic economic policies. Focus on raw material specialization means that the channels transmitting changes in economic situation in the world economy are directly transmitted to their economies [Rynarzewski 2010, pp. 35–43].

Lack of large-scale industrialization processes in most African countries will determine their small export capacity, the petrification of monocultural production structure and dependence of economic growth on fluctuating export revenue. As a result, their import capacity will continue to be respectively small. In implementing

their development objectives, African countries in the years 2012–2014 recorded the deficit of the trade balance of approximately 7% of GDP [African Economic Outlook 2013, p. 9]. In countries heavily indebted in foreign financial institutions and exhibiting budget deficits, it can be a significant barrier to more dynamic processes of economic growth. The growing role of foreign direct investment complements, in a sense, the inflow of foreign capital, but its structure, characterized by a high concentration of financial resources in the production of raw materials is not effective for the economies of African countries in the long run. The significant role of money transfers from domestic emigrants confirms the still low capacities of African economies to generate accumulation and acceleration of development.

Despite the significant threats, not to be underestimated, the prospect of development of African countries can be perceived optimistically. The high rate of economic growth in the last 15 years in this group of countries, their relative resistance to the negative effects of the global financial crisis of 2008–2011, visible progress in the process of stabilizing the macroeconomic processes provide positive prospects for further development.

Undoubtedly, in order to implement these optimistic prospects African countries must meet many challenges now and in the coming years. One of the most important challenges is striving at diversification of economic structures by intensifying the processes of industrialization, systematic pursuit of improvements in the functioning of institutions and rational regulation of the economy and increasing competitiveness in the international division of labour, both by expanding the range of processed goods and by the implementation and compliance with international standards and norms.

Huge differences, which occur between the African countries, reflected in different levels of GDP per capita and between their political and economic systems mean that an extremely important postulate regarding their development policy is to avoid universal systemic solutions, but rather to seek ways of development based on including individual economic, political and social circumstances.

## 2. The economic potential of West and East Africa: an overview of key indicators

### 2.1. West Africa

In terms of key macroeconomic indicators, West Africa should be considered an unevenly developed part of the continent with considerable social inequalities and with clear signs of economic backwardness (see Table 1). All West African countries, with the exception of Mauritania, belong to the Economic Community of West African States (ECOWAS). Moreover, all countries except Burkina Faso are

members of the African Union, whereas Nigeria is the only country in the region belonging to the OPEC. The integration process is subject to serious constraints due to the political instability and conflicts in the region [USAID 2013]. The dynamic growth of the economies of West Africa is largely due to the presence of natural resources on the territories of many countries in the region. The most developed sectors of the West African economy are still the industries related to the production of low-processed goods, extraction of raw materials and their processing. Only Benin, Burkina Faso, Cape Verde and Gambia developed agriculture more than the mining industry [UNCTAD 2014].

West African countries are classified in the lowest positions in the world in the development rankings. According to the division developed by the World Bank, most countries belong to the group of countries with low per capita incomes; only Cape Verde, Ivory Coast, Ghana, Mauritania, Nigeria and Senegal are among the countries with lower average income per capita [The World Bank 2015]. Given the human development index (HDI), almost all countries discussed are in the group of countries with a low level of development. Only Ghana and Cape Verde are classified as countries with a medium level of human development. Niger has been ranking the lowest in the ranking for years. All the analysed countries slightly improved their positions in the HDI in 2013 [UNDP 2015]. In addition, according to the social progress index, the countries in the region are at a very low position in the world [Social Progress Imperative 2015].

A very high level of debt in West Africa is primarily due to expansionary fiscal policy financing investments in infrastructure with loans, pursued by the governments since the outbreak of the crisis in the euro zone. Apart from Cape Verde, Nigeria and Guinea, all the countries are classified by the World Bank to a group of highly indebted countries. In addition, these countries being among the poorest and least egalitarian in the world, have become important beneficiaries of ODA [African Economic Outlook 2015; OECD 2015].

The economies of West Africa are mostly characterized by moderate openness to foreign trade. Exceptions include only Mauritania and Liberia, where foreign trade turnover exceeds GDP (see Table 1). The share of West Africa in the global foreign trade remained low and in 2013, it was 0.8% for exports and 0.6% – for imports. West Africa covered 1/4 of exports and 18.5% of imports in Africa in 2013 [UNCTAD 2014]. The most prominent trade partners of the region are the EU, the other African countries, China, USA and India. Foreign trade in West Africa was dominated by Nigeria, which covered 69% of exports and 48% of imports in the region in 2013. The discussed countries made their exports dependent on a small group of agricultural and mineral raw materials (85% of exports), making their situation firmly linked with the prices of natural resources on global markets. The remaining important goods sold by West Africa abroad were gold (6.4%), cocoa beans (5.2%), iron ore (1.4%) and cotton (1%). With regard to imports, the countries

of West Africa are less active. They mainly imported crude oil (16%), ships and barges (5.8%), oil rigs (5.2%), passenger cars (3%), rice (2.5%), pharmaceuticals (1.9%), wheat (1.8%), trucks (1.5%), mobile phones (1.2%), fish (1.1%), cement and sugar (1%) (African Economic Outlook, 2015) [The World Bank 2015]. The position of the region in global value chains remains quite low. West Africa is mainly linked with supply chains in Europe and to a lesser extent, with Asian value chains [WEF 2015].

West Africa is becoming an increasingly important recipient of FDI on the continent. In 2013, \$14.2 billion was invested into the region, which gave it 3<sup>rd</sup> place in Africa (24.8% share in FDI inflows to Africa). By 2013, West Africa had attracted more than \$145 billion in the form of FDI, which meant a 21% share of cumulative FDI in the continent. Most FDI by the end of 2013 flowed to Nigeria (\$82 billion), Ghana (\$19.8 billion) and Ivory Coast (\$8.2 billion) [UNCTAD 2014]. Foreign investors completely disregard Guinea-Bissau and Gambia. The main investors in the region are the US, China, the EU and Japan. Direct investment in the West African countries goes mainly to the mining industry (Guinea, Liberia, Mali, Mauritania, Niger, Nigeria, Sierra Leone, Togo), which has the largest share in the inflow of FDI to the region. However, the significance of the mining sector decreases in favour of other sectors: textile industry (Benin, Mali), tourism (Gambia, Cape Verde), real estate (Mauritania, Cape Verde), telecommunications (Benin, Ghana, Mauritania, Senegal), transport and logistics (Ghana), financial services (Ghana), food and beverages (Ghana, Senegal), agriculture (Liberia, Mali, Senegal, Sierra Leone, Togo), manufacture of rubber and plastic (Liberia), timber industry (Liberia) trade and infrastructure construction (Benin). One may also notice that the investments in sectors related to consumption grow dynamically [The World Bank 2015; USAID 2013; ADF 2015].

West Africa is not a major global foreign investor. In 2013, the countries in the region invested \$2.2 billion in the form of FDI abroad, which gave 18% of all African capital outflows. By 2013, the share of FDI outflows from the region accounted for less than 10% of cumulative FDI from across the continent and was \$15.8 billion. By 2013, Nigeria (\$8.6 billion) and Liberia (\$4.3 billion) invested most FDI abroad. The share of these two countries in the outflows of foreign investment in the region constituted more than 82% in 2013 [UNCTAD 2014]. Nigeria invests primarily in the countries of ECOWAS, and focuses on the financial, insurance, real estate and business services sectors. In turn, Liberia invests mainly in China and Kazakhstan and to a lesser extent in Hungary [IMF 2015]. Other countries are not active in this type of operations. In the last decade, Nigeria, Senegal, Ghana and Mauritania established national investment funds managing surplus outflows from the sale of raw materials, mainly crude oil [Cieřlik 2014].

West Africa is one of the regions with a low level of competitiveness. This is evidenced by labour productivity measures, significantly deviating from the



average productivity in the world (about \$32.5 thousand)<sup>4</sup>. However, the growth rates of labour productivity in most countries of the region exceed the average for sub-Saharan Africa. Investments in public infrastructure increase the attractiveness of the region. Still, the main barriers to doing business in West Africa remain difficulties in meeting the demand for electricity, infrastructure shortages, social and political issues and a difficult business climate (e.g. corruption, incompetent officials). Accounting for the most important indicators of the competitive position of the area, no country ranks among the world's leaders. In terms of competitiveness index compiled by the World Economic Forum, Ghana and Senegal are considered the most attractive region's economies (111<sup>th</sup> and 112<sup>th</sup> place)<sup>5</sup>. Other countries are among the least competitive in the world [WEF 2015]. In the case of Ghana, the success of growth is partially attributable to the activities of local authorities, promoting agricultural production, especially of cocoa beans. Moreover, the expansion of gold oil and natural gas mining stimulates the economy of Ghana. The development of telecommunications and construction also contributes to increasing competitiveness. In the case of Senegal, mainly infrastructure projects stimulate the economy. On the other hand, high dependence on food and oil imports may cause destabilization and shocks coming from global markets [African Economic Outlook 2015]. Ghana and Senegal are also the best of the countries in the region in terms of Knowledge Economy Index, but the level of development of the knowledge economy is very low [The World Bank 2015].

The "Doing Business" reports give the highest rates to Ghana. The strengths of the country include the possibility of obtaining a loan and the protection of minority investors. Ghana presents as the weakest in terms of the occurrence of barriers to foreign trade. However, it should be kept in mind that the country has reduced considerably the number of documents needed for international exchange of documents and introduced electronic services in recent years. The lowest in the reports of the World Bank are the positions of Guinea-Bissau, Guinea, Ivory Coast and Niger [IFC 2014]. The business environment to a large extent is linked with the level of economic freedom prevailing in a given country. In this respect, the Republic of Cape Verde and Ghana are the best in the West African region, since they belong to the group of economies with moderate economic freedom. The worst in terms of the lack of restraint of activity are the same countries, which close the "Doing Business" ranking [The Heritage Foundation 2015].

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<sup>4</sup> The low labour productivity in the countries concerned is accompanied by low wages. For example, the monthly minimum wage in Nigeria in 2013 was approx. \$90, in Ghana \$37, in Senegal approx. \$59 [Bhorat, Kanbur and Stanwicz 2015].

<sup>5</sup> In the case of Ghana, the level of financial market development and innovation was rated as quite high. Senegal was rated the highest in terms of efficiency of the internal and labour market. The main problem of the two countries remains access to sources of financing (WEF 2015).

While equity markets in West Africa are among the less liquid and rather small, in recent years they have provided considerable returns. The most important stock exchange in the region is Nigerian, implementing approximately 7.7% of market capitalization in sub-Saharan Africa. In recent years, the stock market in Lagos has been facing competition in the form of stock exchange in Ghana. However, the market is characterized by low levels of capitalization and turnover [Deutsche Bank 2012]. Furthermore, the credit risk in the West African region is particularly high, and investments in securities issued by countries in the region are considered to be speculative [Standard & Poor's 2015].

With the introduction of innovations in agriculture, industrialization, domestic consumption, tourism and broadly interpreted business services will be a priority in the policy of improving the level of competitiveness for West Africa in the coming years, especially for the more developed countries in the region. Increased production diversification will contribute to the stabilization of economies. Improving the quality of the workforce and the fight against unemployment are proving to be one of the most important challenges for the governments of the countries in the region. The attractiveness of West Africa will depend on skills (mostly government)

Table 1. Economic potential of the countries of West Africa, 2014

Country	Population (million) 2014	GDP (current prices, USD billion)	GDP per capita (current prices in USD)	Consumption (% of GDP)*	Private investment (% of GDP)*	Foreign trade (% of GDP)*	Average annual rate of economic growth in 2006–2014 (%)
Benin	10.32	8.24	798.2	76.5	11.7	58.30	4.6
Burkina Faso	16.93	11.88	701.7	58.7	12.5	62.80	6.1
Cape Verde	0.50	2.11	4,236.2	68.4	30.9	90.60	3.7
Ivory Coast	20.32	27,74	1,365.2	88.4	9.7	95.00	3.7
Gambia	1.85	0.91	491.6	60.9	10.4	71.30	3.3
Ghana	25.90	45.18	1,744.1	60.9	21.1	86.00	7.0
Guinea	11.75	6.81	580	90.8	15.1	57.80	2.4
Guinea-Bissau	1.70	0.89	521.6	94.5	2.7	54.60	3.0
Liberia	4.29	1.66	385.5	87.5	38	292.30	7.4
Mali	15.30	11.07	723.6	63.3	10.9	66.40	3.9
Mauritania	3.89	4.07	1,045.6	71.1	38.3	169.20	4.7
Niger	17.83	7.64	428.6	70.0	23.9	48.20	5.6
Nigeria	173.62	284.35	1,637.8	55.5	10.6	60.60	6.3
Senegal	14,13	15.11	1,069.1	76.6	22.2	80.90	3.4
Sierra Leone	6.09	5.32	873.6	101.3	10.1	92.90	8.1
Togo	6.82	4.32	634	79.6	18.2	83.60	4.2

\* Data for 2013.

Source: Own study based on data The World Bank [2015] and African Economic Outlook [2015].

of building proper infrastructure, legal system, elimination of poverty, social inequality and reducing corruption and stimulating the development of financial systems. The privatization processes, especially in key sectors of economies of these countries are often indicated as a factor in raising competitiveness of the region. Small business support, lack of proven standards and quality of production, poor integration with the global economy, fragmented regional markets, low effectiveness of the fight against terrorism<sup>6</sup> and frequently contradictory national and local development strategies reduce the attractiveness of the region, making West Africa lose in competition with major operators of the global economy, such as the BRICS countries. In addition, haemorrhagic fever epidemic, which broke out in June 2013 contributed to the decline in the attractiveness of the region.

## 2.2. East Africa

The geographical region of East Africa in sub-Saharan part includes eighteen countries, classified into several sub-regions. Burundi, Kenya, Rwanda, Tanzania and Uganda – located in the central part of East Africa, also referred to as the Great Lakes Region – form the EAC – East African Community. Countries of the Somali Peninsula – Djibouti, Eritrea, Ethiopia and Somalia – are known today as the Horn of Africa. Comoros, Mauritius and Seychelles are small island countries in the Indian Ocean, like adjacent Madagascar. Mozambique is in the southern part of the subcontinent, as well as Malawi, Zambia and Zimbabwe, which in the years 1953–1964 were part of the Federation of Rhodesia and Nyasaland. East Africa also includes South Sudan. Egypt and Sudan – located geographically in East Africa – are classified as countries of North Africa and therefore have not been included in this analysis<sup>7</sup>. Most countries in the region – except for Mozambique, Somalia, South Sudan and Tanzania – are part of the Common Market for Eastern and Southern Africa (COMESA).

The countries of East Africa are largely varied. This applies not only to the size of economies, growth, or the level of socio-economic development, but also to cultural, geographical and historical aspects.

According to the World Bank classification, most East African countries belong to the group with low income per capita. Mauritius is among the countries with upper middle incomes, and the group of economies with lower middle incomes comprises Kenya and Zambia. Seychelles is a country with high income. Low-income countries vary considerably. The level of per capita income fluctuates from \$250 per

<sup>6</sup> In the rankings showing the level of security, Nigeria has been presented as the worst in the West African region for several years [Institute 2015].

<sup>7</sup> Burundi and Rwanda in some international rankings are classified in the Central African region; Mozambique, Malawi, Zambia and Zimbabwe in the Southern African region and South Sudan in the region of North Africa. This applies, for example, to UNCTAD bases.

capita in Malawi and \$270 per capita in Burundi, is twice as high in Eritrea (\$530) and Ethiopia (\$550), and in Tanzania and South Sudan it exceeded \$900 in 2014 (see Table 2). Similarly, the highest level of human development measured by the HDI is listed in Mauritius and Seychelles, classifying countries into the group with high levels of HDI. Zambia is among the countries with a medium HDI level – 141<sup>st</sup> in the ranking. In other countries of the region, the level of human development has been estimated as low [UNDP 2014]. Particularly large shortages are observed in education. The average number of years of education in East Africa was 4.9 in 2013, and in Burundi, Ethiopia and Comoros did not exceed three years. Life expectancy is about 60 years [UNDP 2014].

East Africa has the largest number of countries affected by problems of poverty and socio-economic underdevelopment. In nine of them – Zimbabwe, Burundi, Malawi, Zambia, Tanzania, Rwanda, Mozambique, Uganda and Madagascar – the percentage of the population living below 1 dollar the poverty line exceeded 50% in 2013 [Nawrot 2014]. In Kenya and Ethiopia, it was 43.4% and 39% [Nawrot 2014]. According to the calculation of multidimensional poverty index MPI, the countries of East Africa rank in the top of the ranking among all developing countries, and in many of them, the number of people living in extreme poverty exceeds 70% of the population [UNDP 2013]. Extreme poverty in the countries contrasts with the high pace of economic growth seen in African countries in recent years. The highest average annual rate of economic growth in the years 1985–2014 was recorded in Mozambique (6.4) and Uganda (6.1%), and Ethiopia (5.8%), Tanzania (5.2%) and Rwanda (5.0%). The lowest growth rates, below 2%, occurred in Djibouti, South Sudan and Zimbabwe (see Table 2). The level of savings in GDP is significantly below the world average, while countries in the region are among the most indebted ones, in which development aid plays a vital role. The largest recipient of development aid in the region in terms of share in the national income is Burundi, where, in 2010 ODA accounted for 30% of GNP [Nawrot 2014]. In 2013, the share of ODA in Burundi decreased to the same level as in Somalia – 20.1%. The values of ODA per capita of East African countries, including those with the highest incomes, are surprising. The highest values of ODA per capita are received by Seychelles – \$282.5, South Sudan – \$126.4 and Mauritius – \$117.8 and Comoros – \$109. The level of development aid per capita, well above the average for sub-Saharan Africa remains in Rwanda – \$97.6, Somalia – \$96.6, Mozambique – \$87.4, Kenya – \$74.1, and Tanzania – \$68.3 [The World Bank 2015].

In terms of inequality in income distribution East Africa is largely varied. The lowest level of inequality measured by the Gini index was observed in Ethiopia, where in 2000–2010 it amounted to a yearly average of 29.1. The low level of inequality is estimated in Burundi (33.3) and Tanzania (39.2). The highest level of inequality exceeding 50 points according to the Gini index is in Zambia and Rwanda – respectively 54.6 and 53.1 [Nawrot 2014].

Based on the analysis of key macroeconomic indicators, it may be concluded that East Africa is one of the poorest and least developed areas in the modern global economy.

Table 2. Economic potential of the countries of East Africa, 2014

Country	Population (thousands) 2014	GDP (current prices, USD billion)	GNP per capita PPP (current prices in USD)	GNP per capita (current prices in USD)	Savings (% of GDP)	Investments (% of GDP)	Export (% of GDP)	Average annual rate of economic growth in 1985–2014 (%)
Burundi	10 816	3.1	790	270	–9.9	18.4	7.8	2.1
Djibouti	876	1.6	2 180*	n/*	17.4**	37.5**	n/*	1.7
Eritrea	5 110	3.9	1 180	530	–18.4**	11.1**	n/*	3.7
Ethiopia	96 958	54.8	1 500	550	10.5	25.5	11.7	5.8
Kenya	44 863	60.9	2 890	1 280	4.3	21.2	16.4	3.9
Comoros	769	0.65	1 530	840	–21.1***	12.4***	17.5	2.1
Madagascar	23 571	10.6	1 400	440	8.9***	32.9***	n/a	2.3
Malawi	16 695	4.3	780	250	5.6	15.6	45.8	3.9
Mauritius	1 260	12.7	18 290	9 710	13.2	25.4	53.7	5.0
Mozambique	27 216	16.4	1 170	630	7.7	24.3	27.2	6.4
Rwanda	11 341	7.9	1 530	650	2.3	21.4	14.9	5.0
Seychelles	91	1.4	24 630	13 990	n/*	n/*	84.1	4.2
Somalia	10 517	n/a	n/a	n/a	–12.5****	15.9****	n/a	2.4
South Sudan	11 911	13.1	2 030	960	48.1	n/*	42.1	1.5
Tanzania	50 822	49.2	2 530	930	17.5	36.6	19.5	5.2
Uganda	37 782	26.3	1 690	660	13.8	24.6	19.8	6.1
Zambia	15 721	27.1	3 860	1 760	33.9	24.9	40.9	4.3
Zimbabwe	15 245	13.7	1 710	860	24.3	22.8	26.5	1.2

\*Data from 2013; \*\*Data from the 2007; \*\*\*Data from the 2010; \*\*\*\*Data from 1990; n/a – not available.

Source: Own study based on data from the World Bank [2015].

Economies in East Africa are only somewhat open to foreign trade. Shares of exports in GDP of the countries in the region are well below 100%, and in many cases are below 20% – Ethiopia (11.7%), Rwanda (14.9%), Tanzania (19.5%), and Uganda (19.8%) – Table 2. The region's share in global trade remains negligible, not exceeding 1%. The most important trading partners – similarly to West Africa – are the EU, other African countries, China, India and the USA. The structure of exports is dominated by mineral resources, agricultural products and crude oil. Agricultural products prevail in the exports of Ethiopia, Kenya, Uganda, Burundi and Malawi, Comoros, Mauritius, Seychelles, Somalia, Tanzania and Zimbabwe. Crude oil is the main export product of South Sudan, and mineral resources of

Mozambique and Madagascar [WTO 2015]. There are also records of the growth in exports of commercial services in East Africa, which occurred as a result of the expansion of air transport services of Ethiopia and tourist services of Tanzania and Uganda [WTO 2015].

East Africa has the lowest share in the continent in the inflow of capital in the form of foreign direct investment. In 2014, FDI inflow exceeded \$6.7 billion, which accounted for 12.6% of FDI inflows to Africa. Most investments in 2014 were sent to Tanzania, Ethiopia and Uganda. These countries by 2014 had also attracted the most FDI, respectively, \$17 billion; \$7.2 billion; \$9.9 billion. The cumulative value of FDI in 2014 amounted to \$55.4 billion, which accounted for 7.8% of FDI inflows to Africa [UNCTAD 2015]. The increasing inflows of investment to Mozambique and Zambia, classified by UNCTAD to the Southern African region should also be noted. FDI inflow to Mozambique in 2014 exceeded \$4.9 billion, and to Zambia \$2.4 billion. Cumulative FDI inflows in Mozambique exceeded 25.5 billion US dollars, and in Zambia, US \$15 billion [UNCTAD 2015]. Very few investments are made in the Comoros and Eritrea, and Somalia, Djibouti and Malawi, and the inflow in 2014 ranged from \$10 million to \$130 million.

The countries of East Africa are not major foreign investors. The value of the outflow of FDI in 2014 amounted to only \$99 million, representing 0.75% of the capital flowing out of the continent. Madagascar, Mauritius, Seychelles, Uganda and Kenya remain FDI donors. The cumulative value of the outflow reached \$2.1 billion in 2014, which accounted for 1% of cumulative outflows from African countries [UNCTAD 2015]. The cumulative value of FDI outflows from Zambia at the end of 2014 amounted to more than \$2.4 billion. FDI outflows throughout the continent declined in 2014 by 18% from \$16 billion to \$13 billion.

Most foreign investment on the continent – 48% – is located in services. The cumulative value of FDI in services between 2001 and 2012 quadrupled, but it is not a share comparable to other developing countries. The share of the manufacturing sector in the cumulative value of FDI in 2012 was 21% and the primary sector 31%. In contrast to North, West and South Africa in 2014, East Africa has seen an increase in FDI inflows by 33% and 11%, reaching a value of respectively, \$12 billion and \$6.7 billion. Major investments were made in natural resources (gas) in Tanzania and in the industrial sector – in textiles – in Ethiopia, attractive due to its low labour and electricity costs. None of the African countries is at the forefront of economies attracting large amounts of foreign direct investment. Both the inflow and outflow of FDI remain unchanged. Africa's share of world FDI inflows in 2014 reached 4.4%, and 1% in outflows. The same values have been maintained since 2012. The main investors in East Africa are China, other countries in Africa (mainly South Africa), India, the EU and the USA. The main investors from developing countries include China, India, South Korea., Brazil and South Africa.

The most favourable climate for business according to the “Doing Business 2015” reports is in Mauritius and Rwanda – respectively 28<sup>th</sup> and 46<sup>th</sup> position in the ranking of 189 countries in the world. Mauritius draws attention with the ease of foreign trade transactions and tax issues. Furthermore, the protection of minority investors and procedures related to starting a business are also highly rated. In recent years, Rwandan has undertaken a number of actions aimed at improving the business environment. The country ranks particularly high in terms of credit opportunities, property rights and fiscal policy favourable for business. Moreover, the procedures related to building permits and the availability and cost of electricity have been simplified. Further positions in the ranking among the East African countries included Seychelles (85), Zambia (111), Mozambique (127), Tanzania (131), Ethiopia (132) and Kenya (136). Further down the ranking classified Uganda (150), Burundi (151), Djibouti (155), Comoros (159), Madagascar (163) and Malawi (164). Climate in Zimbabwe (171), South Sudan and Eritrea (189) was rated as the worst [The World Bank 2015]. In all these countries, the problem areas include the availability of electricity, the enforcement of contracts, obtaining permits and other business documents and difficulties in foreign trade.

Mauritius and Rwanda have also been rated highest in terms of competitiveness according to the classification of the World Economic Forum – respectively 39<sup>th</sup> (4.52<sup>8</sup>) and 62<sup>nd</sup> (4.27) position. Other countries in East Africa ranked as follows: Kenya (90; 3.93), Seychelles (92; 3.91), Zambia (96; 3.86), Ethiopia (118; 3.60), Tanzania (121; 3.57), Uganda (122; 3.56), Zimbabwe (124; 3.54), Madagascar (130; 3.41), Malawi (132; 3.25), Mozambique (133; 3.24), and Burundi (139; 3.09) [WEF 2014].

East African countries are therefore characterized by an exceptionally low level of competitiveness. According to the World Economic Forum classification, none of the countries in the region is in the stage of innovation stimulated development. Mauritius and the Seychelles are in a transition phase from a group of countries with efficiency stimulated growth to the innovation stimulated development. Almost all countries in East Africa have been classified to the stage of factors-stimulated development. This group includes Burundi, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Tanzania, Uganda, Zambia and Zimbabwe. There are no countries with efficiency stimulated development, or in the phase of transition to the efficiency stimulated economy. The countries of the region are characterized in particular by lower levels of innovation and technological readiness. Furthermore, a very low level of infrastructure, institutional solutions and education is emphasised.

Corruption is a significant barrier in the East African countries. Its level is visible in comparative analysis of corruption perception indicators, as well as the indices of economic freedom. Economies of the region where freedom is repressed include

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<sup>8</sup> The value of the index according to the WEF [2014] can be found in parentheses.

Table 3. Comparison of indicators illustrating the potential of selected economies in West and East Africa in 2013

Indicator	West Africa		East Africa	
	Ivory Coast	Nigeria	Kenya	Mozambique
Nominal GDP (USD million)	27,736.04	284,351.67	60.9	16.4
Participation in the regional economy	6.30%	65.00%	19.8%	5.33%
Real GDP growth (%)	7.2	6.6	5.3	7.2
GDP per capita (USD)	1,365.2	1,637.8	1,358.3	585.6
GDP per capita growth (%)	6.45	2.49	2.58	4.2
Natural resources (agricultural and mineral)	crude oil, natural gas, diamonds, manganese, iron ore, cobalt, bauxite, copper, gold, nickel, tantalum, silica sand, clay, cocoa beans, coffee, palm oil, bananas, palm kernel, corn, rice, cassava (tapioca), sweet potatoes, sugar, cotton, rubber and wood	crude oil, natural gas, tin, coltan, iron ore, coal, limestone, lead, zinc, cocoa, peanuts, palm oil, maize, rice, sorghum, millet, cassava (tapioca), yams, cattle, sheep, goats, pigs; wood industry; fish	tea, coffee, sugar cane, gardening products, nature	coal, titanium, natural gas, hydropower, tantalum, graphite; agricultural products: cotton, cashew nuts, sugarcane, tea, cassava (tapioca), corn, coconuts, sisal, citrus and tropical fruits, potatoes, sunflowers; beef, poultry
Most developed sectors of the economy	foodstuffs, beverages; wood products, oil refining, truck and bus assembly, textiles, fertilizer, building materials, energy, ship building and repair	crude oil, coal, tin, coltan, oil, palm oil, peanuts, cotton, rubber, wood, hides and skins, textiles, cement and other construction materials, food products, footwear, chemicals, fertilizers, ceramics, steel	consumer goods (plastic, furniture, batteries, textiles, soap, cigarettes, flour), processing of agricultural products; oil refining, cement; tourism	food, beverages, chemicals (fertilizer, soap, paints), aluminum, petroleum products, textiles, cement, glass, asbestos, tobacco
HDI (ranked)	171	152	147	178
(Social Progress Index) – place in the world / 133 (%)	n/a	125	104	120
Exports of goods	12,372.33	94,766.4	6,115	4,725
Imports of goods	10,157.48	51,161.15	18,395	8,747
Export of services for 2012	984.4	2,410.83	4,935	1,272
Imports of services for 2012	2,834.53	24,044.28	2,934	3,671



Current account balance (% of GDP) for 2012	5.8	7.9	-10.59	-34.52
Openness of the economy (foreign trade / GDP)	95.00%	60.60%	53.00%	100.00%
Specialization in exports (3 commodity groups)	pearls, precious stones, gold, agricultural commodities, raw materials	pearls, precious stones, gold, fuels, other ores	tea, cut flowers, oil	aluminium, oil, bituminous coal
Commodity terms of trade	141.9	222.1	88%	95%
FDI inflows (USD million)	370.99	5,609	989	4,902
FDI inflows per capita (USD)	18.26	32.31	21.7	18.5
FDI as % of GDP	1.3	2	1.62	29.8
Cumulative FDI inflows (USD million)	8,232.5	81,977	4,370	25,577
FDI outflows (US \$ million)	33.16	1,237	-	-
Cumulative FDI outflows	177	8,645	321	10
Labour productivity (thousand USD)	3.27	5.21	n/a	n/a
Productivity growth (%)	8.8 *	-11.7	n/a	n/a
Place in the „Doing Business” ranking	147	170	136	127
Index of Economic Freedom	58.5	55.6	55.6	54.8
Corruption Perception Indicator (place out of 175 countries)	136	144	145	119
WEF competitiveness index (position in the ranking from 2014 to 2015)	115	127	90	133
KEI (place in the ranking of 2012)	136	119	111	130
Rating (S & P)	n/a	BB-	n/a	n/a

Source: Own study based on (ADB, OECD, UNDP, 2014) [African Economic Outlook 2015; Ernst & Young 2013, 2012; IFC 2014; The World Bank 2010, 2015; WTO 2015; UNIDO 2011; UNCTAD 2014].

Zimbabwe and Eritrea. Most of the East African countries are mostly restrained economies, including Burundi, Ethiopia, Kenya, Malawi, Mozambique, Seychelles, Djibouti, Tanzania, Zambia and Uganda. The group of moderate economic freedom includes Rwanda, and Mauritius has been rated as mostly free. South Sudan and Somalia have not been classified [The Heritage Foundation 2016].

The opportunities for cooperation in the countries of East Africa may be seen in infrastructure projects necessary in the countries of the region and in inter-regional terms, in development of services – in particular tourism and business, cooperation on industrial projects and in agricultural sector. Improving education will be essential for the growth of the quality of workforce and human capital. Infrastructure investment – in both transport and manufacturing – will improve the competitiveness of the region, increasing the attractiveness to potential investors. The road infrastructure in East Africa is very poorly developed. Furthermore, the availability of electricity and meeting the demand for electricity should also be emphasised, as they are significant barriers to doing business. Corruption remains an unsolved problem, hindering and delaying the dynamics of economies.

Comparison of indicators illustrating the potential of selected economies in West and East Africa in 2013 is presented in Table 3.

### 3. Polish economic cooperation with selected countries in West and East Africa

In recent years, trade relations between Poland and Africa have entered a new phase: the reorientation from the markets of North Africa toward sub-Saharan Africa. The phenomenon of increasing the role of this area in the Polish-African economic relations is evidenced by increasing growth and transformation in the structure of trade in goods and a marked increase in the interest of Polish investors in investing capital in the region. So far, the countries of North Africa and South Africa have been recognized by Polish entrepreneurs as the main directions of cooperation. However, Polish business marks its presence in West and East Africa with increasing frequency, mainly in the Ivory Coast, Nigeria, Mozambique and Kenya.

#### 3.1. Polish economic relations with selected countries in West Africa: Ivory Coast and Nigeria

**Ivory Coast** got ahead of Nigeria in recent years, and became Poland's second trade partner in sub-Saharan Africa after South Africa and the sixth partner in the whole continent. Capital flows between Poland and Ivory Coast are virtually non-existent. High position of Ivory Coast in the ranking of Polish trade partners may

be explained by the country building a favourable environment for international cooperation after years of political instability. Ivory Coast is significantly higher than Nigeria in the “Doing Business” rankings [The World Bank 2015] and the index of economic freedom [The Heritage Foundation 2015]. Furthermore, it has a lower level of corruption [Transparency International 2015] and political risk than Nigeria, and most importantly, the country’s economy is much less dependent on raw materials. This image brought the interest of Polish companies in Ivory Coast, which began to be regarded mainly as a supplier of food.

The high value of trade with Ivory Coast is a consequence of significant Polish imports, amounting to more than \$183 million in 2013. Polish exports to those markets remained low amounting to \$20.7 million. Thus, Poland has a permanent trade deficit with Ivory Coast. Both exports and imports increased in the years 1994–2013, respectively 9-fold and 3.5-fold. The share of exports to Ivory Coast in total Polish exports was only 0.01% in 2013, while the imports were 0.09%. Our country imported primarily raw materials and semi-finished products from Ivory Coast in 2013 (respectively 50.84% and 48.9%). The leading group of goods imported from the local market were food products (mainly cocoa, coffee and palm oil), which accounted for 59.25%, and rubber (38.7%). The low level of diversity of the types of imported goods is also evidenced by the high value of the Gini index (0.831). The structure of imports seen in 2013 does not differ much from that in the 1990s, the only difference being an important role of vegetables in Polish imports from Ivory Coast. It is difficult to point to the dominant commodity group in Polish exports to Ivory Coast. The distribution here is almost even between live animals (26.74%), chemical products (24.2%) and wood and wood products (23.05%). Two decades earlier, we exported primarily metals and metallurgical products to that market. Currently, that group of goods has a negligible share in Polish exports [The World Bank 2015]. The level of concentration of Polish exports to Ivory Coast was relatively high in 2013 (see Table 4).

Polish-**Nigerian** diplomatic relations were established in 1962. Currently, Nigeria is the third Polish trade partner in sub-Saharan Africa after South Africa and Ivory Coast, but only 7<sup>th</sup> co-operator in the whole of Africa. In 2013, we exported goods worth nearly \$91.7 million to that market, which is 6 times more than two decades earlier. Meanwhile, we imported goods worth \$23 million. Thus, the balance of the Polish-Nigerian trade was positive and amounted to \$68.63 million. The share of exports to Nigeria in the total value of Polish exports amounted to 0.05% in 2013, and imports to 0.01%. The role of trade with Nigeria as compared to sub-Saharan Africa was also not high. Nigeria’s participation in Polish exports to the region of sub-Saharan Africa accounted for 6.1% and imports for 1.8% (see Table 4).

Polish exports to Nigeria in 2013 were relatively diversified, as evidenced by the relatively low Gini index (0.583). Our export is dominated by consumer goods (47.87%), followed by capital goods and semi-finished products with shares

respectively 24.89% and 24.33%. The main products sent to the local market are machinery and electronics (28.6%), followed by export of fuel (16.56%) and wood and wood products (13.45%). 20 years earlier, we only sent semi-finished products to Nigeria (93.23% of the exports), mainly metals and metal products (53.31%) and chemical products (22.32%). Nowadays, mainly Polish mining, marine, energy and ICT companies show interest in the Nigerian market. Polish enterprises intensively trading with Nigeria include Ciech, Zakłady Chemiczne Police, Tele-Fonika Kable, Fibris, Grupa Lotos, ABB, Navimor, and Ursus. Furthermore, the Poles working in Nigeria, including university lecturers, doctors and representatives of various technical professions, also have their hand in the intensification of relations. Many Poles participated in the construction and technical projects, such as construction of a new capital – Abuja [Łazowski and Wójcik 2000].

Exports of Nigeria to Poland are largely determined by the unstable internal situation of the country and, consequently, political and economic risks. Hence the observed significant fluctuations in the dynamics of mutual trade relations [The PRS Group 2013]. Significant changes in the structure of imports from Nigeria warrant a closer look. In the 1990s, food products dominated (61.02% share in imports in 1994) followed to a lesser extent by fuels (37.89%). Generally, raw materials generated Polish imports from Nigeria (89.79%). Within two decades, Poland quite clearly rebuilt the structure of goods imported from Nigeria. Over the past few years, we have been importing mainly wood and wood products (39.76% share in imports in 2013), rubber (31.41%) and vegetables (19.84%) [The World Bank 2015]. This represents an increase in diversification of imports, but it still remains quite concentrated, as indicated by the Gini index (0.750) (see Table 4).

Capital flows reflect the still minor Polish-Nigerian cooperation [NBP 2015]. The best known Polish companies operating in Nigeria include Wind Mobile, Ursus, Energoprojekt Katowice, Navimor and the most extensive Polish project – Kulczyk Investments.

### 3.2. Polish economic relations with selected countries of East Africa: Mozambique and Kenya

Poland established diplomatic relations with **Mozambique** on the day of the country's proclamation of independence (25 June 1975). In the 1980s, bilateral cooperation between Poland and Mozambique demonstrated intensity due to the countries concerned belonging to the Eastern bloc. Numerous bilateral visits were a demonstration of lively relations. After the democratic transformations in Poland and Mozambique, the number of these visits has decreased [MFA 2015].

Polish trade relations with Mozambique were truly extended only less than a decade earlier, whereas capital flows between countries are virtually non-existent. At

the end of 2013, exported goods worth \$13.8 million to Mozambique and imported goods worth more than \$60 million. Although the values presented compared to the previously discussed countries are not high, attention should be paid to the high growth of trade value. In 1996–2013 (no data since 1994), Polish exports to Mozambique increased more than 181-fold, while imports from that country increased 106-fold. At the same time, significant fluctuations in mutual trade can be observed, which places Mozambique, like Ghana, among the Polish partners of rather ad hoc nature. We mainly sell capital goods to Mozambique, whose share in Polish exports to Mozambique amounted to 52.27% in 2013. Machines and electronics (51.09% of the total Polish exports to that market), and metals and metallurgical products (22.62%) are the most important in Polish exports. In 2013, we imported mainly raw materials (51.79%) and to a slightly lesser extent semi-finished products (47.10%) from the Mozambique market. Polish imports from Mozambique almost exclusively cover two product groups: food (81.87%) and to a lesser extent, metals and metallurgical products (16.87%), mainly aluminium [The World Bank 2015]. Concentration indices for both exports and imports are quite high (see Table 4).

Diplomatic relations between Poland and **Kenya** were established in 1963. By the end of 1980s, Kenyan-Polish relations were not very lively beyond correctness and only after transformation in our country, these have been substantially increased. The acceleration of interactions was due to a number of bilateral visits [MFA 2015]. The country discussed is seen as a prospective Polish partner, but as in the case of Mozambique, Poland focused on trade relations, neglecting investments in Kenya. Although the present Polish trade with this country was \$62 million in 2013, of which exports was estimated at less than \$39 million, while imports amounted to \$23 million (see Table 4). In the years 1994–2013, exports to Kenya increased 16 times, while imports rose 12-fold. The analysis of trade relations with Kenya deserves special mention regarding the huge growth dynamics of Polish exports to those markets. In the years 1994–2013, the average annual rate of increase of Polish goods sold to the Kenyan markets was 205%<sup>9</sup>. However, the years 1994–2013 were characterized by significant fluctuations in the value of exports, which can be interpreted as a low stability of the demand for our products reported by the Kenyan consumers. The particularly large declines in Polish exports to Kenya were observed in the second half of the 1690s. However, in recent years this growth has stabilized. We mainly export consumer goods to Kenya (40.04% of the value of exports in 2013), as the country's growing economy records high demand for this type of goods. Capital goods ranked second (25.87%). Two decades ago, no Polish consumer products went to the Kenyan market, while capital goods prevailed (66.15% in 1994). The origins of Polish trade cooperation with Kenya were related

<sup>9</sup> Such a high average growth rate is due to the huge leap in Polish exports to Kenya in 2003, when the exports increased 34-fold compared with the previous year [The World Bank 2015].

Table 4. Indicators of trade and capital flows for selected Polish trade partners in West and East Africa in 2013

	Ivory Coast	Nigeria	Mozambique	Kenya
Value of exports of goods (million USD)	20.73	91.67	13.8	38.92
Value of imports of goods (million USD)	183.33	23.04	60.1	23.29
Trade balance (USD million)	-162.61	68.63	-46.31	15.63
Share of exports to the country in total exports of Polish goods	0.01%	0.05%	0.01%	0.02%
Share of imports in the total Polish import of goods	0.09%	0.01%	0.03%	0.01%
Products exported by Poland	<ul style="list-style-type: none"> <li>- live animals (26.74%)</li> <li>- chemical products (24.2%)</li> <li>- wood (23.05%)</li> </ul>	<ul style="list-style-type: none"> <li>- machinery and electronics (28.6%)</li> <li>- fuels (16.56%)</li> <li>- wood (13.45%)</li> </ul>	<ul style="list-style-type: none"> <li>- machinery and electronics (51.09%)</li> <li>- metals and metallurgical products (22.62%)</li> <li>- vegetables (12.02%)</li> </ul>	<ul style="list-style-type: none"> <li>- textiles and clothing (23.87%)</li> <li>- vegetables (19.93%)</li> <li>- transport equipment (13.23%)</li> </ul>
Products imported to Poland	<ul style="list-style-type: none"> <li>- food (59.25%)</li> <li>- plastics and rubber (38.7%)</li> <li>- vegetables (1.76%)</li> </ul>	<ul style="list-style-type: none"> <li>- wood (39.76%)</li> <li>- plastics and rubber (31.41%)</li> <li>- vegetables (19.84%)</li> </ul>	<ul style="list-style-type: none"> <li>- food (81.87%)</li> <li>- metals and metallurgical products (16.87%)</li> <li>- vegetables (1.01%)</li> </ul>	<ul style="list-style-type: none"> <li>- vegetables (95.02%)</li> <li>- food (3.57%)</li> </ul>
Share of intra-industry trade in total turnover *	0.97%	21.80%	11.40%	28.60%
Concentration of the commodity structure of Polish exports to the country **	0.685747	0.583498	0.769502	0.558698
Concentration of the commodity structure of Polish imports from the country **	0.830839	0.749877	0.844991	0.907475
Value of exports of services (USD million)	0.38	7.89	n/a	1.39

Value of imports of services (USD million)	1.88	1.88	0.75	2.38
Balance of trade in services (USD million)	-1.5	6.01	n/a	-0.99
Share of exports of services to the country in total Polish exports of services	0.00%	0.02%	n/a	0.00%
Share of imports of services from the country in total Polish import of services	0.01%	0.01%	0.00%	0.01%
FDI coming from Africa to Poland (USD million)	0	0.1	0.1	-0.1
Cumulative FDI coming from Africa to Poland (USD million)	0	-0.2	-0.1	-0.1
FDI outflow from Poland to Africa (USD million)	0	0.2	0	0.3
Cumulative FDI outflow from Poland to Africa (USD million)	0	0.4	0	0.5

\* Measured in  $GL_t$ ; \*\* Measured by Gini coefficient.

Source: Own study based on: [IMF 2014; Eurostat 2014; UNCTAD 2013; NBP 2015; The World Bank 2015; CSO 2015].

to the export of transport equipment, which accounted for about 2/3 of its value in 1994. In 2013, we sold diverse products to Kenya, mainly textiles and clothing (23.87% of the value of exports to that market), vegetables (19.93%) and transport equipment (13.23%). We import almost exclusively vegetables from the local market (95.02%), which means lack of reconstruction of the commodity structure of imports over the last two decades [The World Bank 2015].

For several years, Kenya has been one of the most important African beneficiaries of Polish development aid. This support is often provided through the Polish missionaries. On June 16, 2014, Kenya and Poland signed an agreement for the development of trade relations, enabling more Polish investors to open trade outlets in Kenya, importing more goods from Kenya in return. Polish companies have plans to invest in agriculture, mining and pharmaceutical sector [Embassy].

## Conclusions

Although the Polish relations with West and East Africa are still seen as a marginal phenomenon, the boost in bilateral relations may be expected in the near future. A number of reasons support the intensification of relations. Firstly, in the coming years we can expect an increase in the competitiveness of countries in West and East Africa. Their economies have been on a trajectory of growth for several years. The stimuli of these increases are government and consumption spending (especially made by the emerging middle class) and FDI. The demand of local markets for advanced technologies is rapidly increasing, not only in scope of production but also in banking, pharmaceutical industry, and telecommunications. Secondly, these regions slowly cease to be associated only with the mining and raw materials in Poland, but are increasingly being seen as a potentially significant and rapidly growing market, reporting demand for consumer products and infrastructure projects. This creates opportunities for Polish exports in broadly defined consumer goods and services and for investment and advisory cooperation in the construction of the local infrastructure. Thirdly, the rapid growth of the economies of West and East Africa and qualitative changes make the returns on investment in the region far outweigh the gains in developed countries. However, one must keep in mind a much higher risk for projects undertaken there.

Despite the opportunities which acceleration of economic cooperation with West and East Africa entails, Polish business still faces a number of challenges associated with the economic, social and political characteristics of this group of countries. The most important problems faced by Polish entrepreneurs include still significant dependence of local markets on global commodity prices, relatively low import capacity of African countries, deficiencies in the development of their



infrastructure, difficult climate for business (e.g. corruption, underdeveloped legal regulations, unstable governments, lack of adequate competence of officials and still low level of qualifications of employees), often a lack of democracy and transparency, and frequent authoritarianism. The acceleration of future mutual trade depends on determination of Polish entrepreneurs and consistency of African countries in eliminating barriers to development.

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# Measuring the international trade flows in terms of expansion of global value chains

## Introduction

We are currently witnessing significant changes in world trade. Based on the available data it can be stated that these changes are dynamic, but sometimes difficult to interpret unambiguously. The observed growing role of developing countries in international trade is conducive to drawing conclusions about the return of classically interpreted comparative advantage, as again the main driving force for trade [Krugman 2009]. On the other hand, specialization in exports of manufactures (including high-techs) on the side of developing countries seems to be in contradiction with classical directions. This raises the question of whether the theories lose their explanatory power, or maybe tools to measure and describe the situation in world trade ceased to be adequate, which leads to false and sometimes contradictory conclusions. Maybe the changes are so far-reaching that they invalidate both theories and traditional measures of trade? The purpose of this article is to attempt to answer such questions by pointing to factors shaping the current architecture of world trade and reflection on how the “old theories” and “old measures” retain their usefulness.

The next section outlines the major trends of global trade, pointing to the contradictions in reasoning conducted with the help of public statistics. Section three presents the idea of global value chains (production networks), in order to show the specificity of trade conducted within such chains. The subsequent section of the article is devoted to discussing the measures taken in recent years by various institutions aiming to develop alternative measures of trade flows, more adequate for the diagnosis of exchange realized in the new global conditions.

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## 1. World trade in the light of the traditional measures

In the last two decades, international trade has grown rapidly. The prevalence of rate of growth of world exports over the growth of global GDP, launched in the mid-20<sup>th</sup> century, has been maintained. Although the effects of the crisis had a devastating effect on the value of trade in goods (sharp decline in 2009 and serious slowdown three years later), the average annual growth of world exports remained higher than the growth of GDP (Figure 1). This observation must lead to the conclusion of the increasing interdependence of the various national economies. If the sales on foreign markets are growing faster than production, this means that increasingly the economies are becoming addicted to the delivery and acceptance of their products abroad.

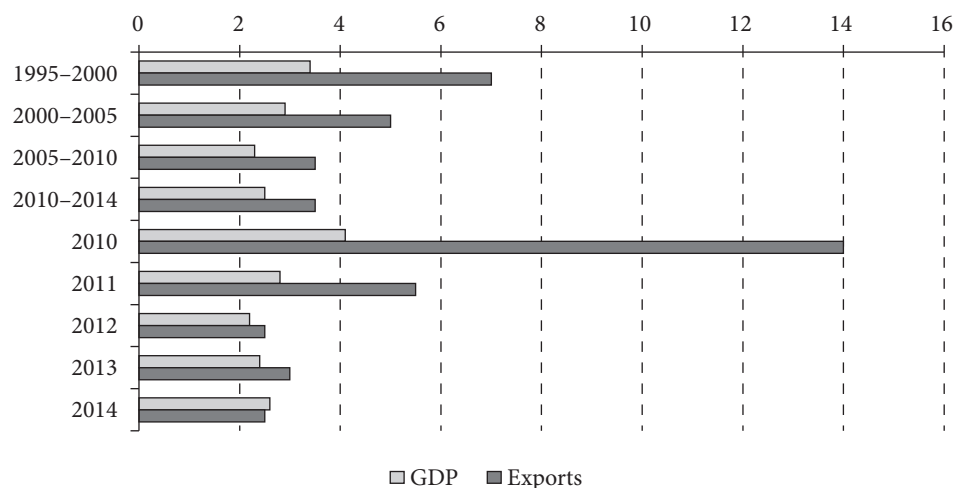


Figure 1. Comparison of the growth rate of world GDP and exports of manufacturing products in the years 1995–2014 (in %)

Source: Compiled on the basis of the WTO data: [www.wto.org/statistics]

The above assertion is confirmed by data showing the increasing share of exports in GDP. Since the sixties of the last century, the share of foreign sales in world GDP has more than doubled (since it increased from 13% to 30%). In the cross-section of countries, in 184 economies classified by the World Bank, 110 have seen an increase in this indicator. In six countries it is currently higher than 100%, and Hong Kong in 2013 reached not recorded earlier level of 230%<sup>2</sup>.

In addition to the dynamic growth of value, changes can be also seen in the geographical structure of world trade. More and more active global actors are

<sup>2</sup> Based on data of the World Bank: <http://data.worldbank.org/indicator/NE.EXP.GNFS.ZS>.

developing countries. Recorded in these, exceptionally high export growth (significantly exceeding the average for the world) meant that from 1986 onwards, their share in world trade has grown steadily, reaching in 2012 the record level of nearly 45% (while a decade ago it was less than 32 %, and in the early 90s – 24%)<sup>3</sup>.

It should be noted that an increasing proportion of world trade is carried out between developing countries themselves. In 2014, developing countries sent 52% of their exports of industrial goods to the other partners in this group, an increase of 14 percentage points compared to the corresponding proportion two decades ago [WTO 2015, p. 28]. As a result, the share of South-South exchange in world trade is now three times higher than in the early nineties. [WTO 2013, p. 65].

Closer analysis of the statistics, however, reveals another side of the trend shown above. Although the overall conclusion as to the growing interdependence of economies is the most accurate, the precision of its measurements using data on GDP and exports remains low. GDP is calculated as the sum of value added, and exports and imports are presented in gross amounts. In this regard, the comparison of both parameters in order to calculate of the share of exports in GDP becomes much less informative.

The apparent scale of shifts in the structure of world trade also requires reflection. Although the participation of developing countries in world trade is growing, the actually dynamic actors remain only China and, to a much lesser extent, India. The participation of seven Asian newly industrialising countries in world exports, as well as South American leaders in exports – Brazil and Mexico, over the last decade has remained constant [Mińska-Struzik 2014], and according to the latest data of the WTO in 2014, it marginally shrunk [WTO 2015, p. 28].

Dynamic exporters, including mainly China, seem to develop at the same time a specialization incompatible with their traditionally interpreted comparative advantage. They systematically increase the export of high-tech products, which resulted not only in striking down the US leadership in the world ranking of high-tech exporters, but it also meant that since 2002 the United States have been recording deficit in trade in these products [Mińska-Struzik 2011]<sup>4</sup>.

As evidenced by the results of research by Edwards and Lawrence [2010] US industries with large shares of imports from developing countries are in fact more knowledge – and science intensive than those characterized by high shares of

<sup>3</sup> The temporary reversal of the upward trend occurred in the crisis year 1998. Similarly, in 2001, a significant slowdown in economic growth in developed countries, resulting in a substantial reduction in import demand strongly struck in developing countries, causing a decrease in their share in world exports. This scenario was not repeated, however, in 2009. Due to the global recession, the slump in exports was much stronger on the side of the developed countries, which enabled developing countries to increase their share of world exports by 0.85 percentage points. This ratio in 2010 increased by more than two percentage points and by 2.6 percentage points in the next two years.

<sup>4</sup> In 2013, China was responsible for 1/3 of world exports of computers and office equipment, while in 2000 the corresponding rate stood at 4.5% [WTO 2014b].

imports from developed countries. Schott [2008], who with the help of an index of similarity of export flows tested differences in the export of China and the countries of the OECD, has established the degree of overlapping trade at a level much higher than expected, taking into account both the size of the market and the level of wages in China. Similar conclusions were reached by Rodrik [2006], arguing that China's "export basket" is far more sophisticated than might be expected given the level of *per capita* income in this economy. Similar conclusions were also formulated by Kiyota [2010], who studied the streams of Japan's imports from the US, EU and China. The cited author found that 85% of products imported from the US are substitutes for goods imported from China. The calculation of the WTO [2013, p. 70] shows, however, that the Grubel-Lloyd index for China in 2011 was 0.40 and its amount was due to exchange with highly developed partners. For comparison, the corresponding index for Japan stood at 0.39, and in the trade with highly developed economies it was even lower – 0.36<sup>5</sup>.

On this basis, it can be concluded that the specialization of developing countries has increasingly intra-industry character, and in this respect they become similar to the more developed partners. However, a simple statement that these economies specialize in the manufacture and export of modern industrial products may be misplaced, if one combines the value-added in high-tech industries with the available export statistics. It may be noted that trade in *high-tech* by far exceeds the added value. For example, in relation to computers and office machinery participation of foreign value-added in exports (i.e., the amount by which, in fact, the value of trade was overestimated) reaches 45% [UNCTAD 2013, p. 128]. What are the reasons for such significant revaluation and, therefore, may the available data on international trade in general be considered credible and useful at all?

## 2. The nature and the scale of trade in global value chains

Outside the "forces" of geography and politics, typically interacting with trends in the global economy, a key determinant of change is now technical progress. It significantly modifies production processes and, broader, the way of doing business. There are two types of such an impact – direct and indirect. The latter is associated with a reduction in transaction costs in relations with business partners. Thanks to advances in communication market imperfections are being reduced, which

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<sup>5</sup> Grubel-Lloyd index of intra-industry trade has a value between 0 and 1. Extreme values are, respectively, the lack of intra-industry trade and overall trade overlap. The highest indexes were found in Hong Kong and Singapore (0.66 and 0.65). One should bear in mind the very large share of re-exports in both of these economies. With regard to Singapore it amounts to 44%, and in the case of Hong Kong exceeds 95%.

favours closer relations with suppliers and customers. Information and communication technologies make it possible to virtually “stay in touch” cost-free, which facilitates the exercise of effective control over geographically dispersed activities, significantly changing the meaning of time and space.

The direct impact of new technologies on manufacturing processes consists in offering technical possibilities of physical segregation of the successive stages of value creation. Geographical diversification of individual value chain links is desirable due to their often highly varied levels of capital and labour consumption. It takes place in such a way as to exploit cost advantages specific to the performance of specific functions, flowing from both economies of scale and low labour costs. In relation to the production phase, its division occurs into producing specific components, possible to move to entities located outside the country. Parallel systematic development of transport techniques and infrastructure increasingly streamlines the delivery of parts and components between different locations (even at large distances), making fragmentation of production even more efficient.

Managing cross-border relationships emerging in such conditions, is characterized by its own specific and although they are linkages between market micro-entities, their increasing scale and nature translate significantly into changes observed in international trade at the level of individual national economies, and further the global economy. Locating the various stages of value creation (from product design, through staged manufacturing, to marketing and sales) in different places in the world stimulates trade flows between different locations, resulting in a situation where as a result of multiple movements of intermediate goods trade value may be significantly overvalued relative to the value of the final product. Therefore, wanting to correctly interpret trends in world trade observed on the basis of macro data, one cannot disregard the business models adopted by firms directly involved in this trade.

Some approximation of the degree and nature of participation of individual economies in global value chains can be an analysis of exchange of intermediate goods (estimated on the basis of data on trade in parts and components). The exchange of this type of goods is currently about a quarter of world trade and this share has been fairly stable for nearly two decades [WTO 2014a]. Since the mid-nineties the rise and expansion of global value chains, however, has revealed a significant shift in the geographical structure of trade in intermediate goods. While in the late twentieth century the demand for them was reported mainly by developed countries, responsible for nearly 2/3 of global imports of intermediate goods, in 2012 this share shrunk to less than 50%. This was accompanied by an increase in purchases of parts and components by developing countries, including especially China. In 2012, 15% of world imports of these goods went to China, while less than two decades ago, the corresponding figure stood at 3% [WTO 2014a].

Significant shifts were also seen in exports of intermediate goods. The cross-section of continents revealed the marked decrease in shares of North America and Europe in the export of these goods after 1995 (by 12 pp.) while in Asia they increased significantly (by 9 pp.) [WTO-IDE JETRO 2011, p. 82]. While developed economies evidently diversify exports towards indirect services, exports of Asian countries focus on intermediate goods produced in the manufacturing industry.

In the global ranking of the largest exporters of intermediate goods predominate developing countries, including in particular those from the region of South and Southeast Asia (Table). Seven of the fifteen leaders have shares in world exports of intermediate goods in excess of the shares in the world's total exports. Nine economies are ranked higher than in the list of the largest exporters of manufactures in the world, which suggests a certain specialization in scope of participation in global value chains.

Leaders of the world's exports of intermediate goods in 2014

Exporter	Intermediate goods			Industrial goods total		
	Ranking	The value of exports (US \$ billion)	Share (%)	Ranking	The value of exports (US \$ billion)	Share (%)
EU 28	1	1 023	12.8	2	2 262	15.0
China	2	963	12.1	1	2 342	15.5
USA	3	771	9.6	3	1 621	10.7
Japan	4	368	4.6	4	684	4.5
South Korea	5	323	4.0	5	573	3.8
Taiwan	6	282	3.5	14	314	2.1
Singapore	7	226	2.8	9	410	2.7
Canada	8	201	2.5	8	475	3.1
Switzerland	9	177	2.2	15	311	2.1
Brazil	10	148	1.9	19	225	1.5
India	11	140	1.8	13	322	2.1
Australia	12	135	1.7	16	241	1.6
Malaysia	13	128	1.6	17	234	1.6
Thailand	14	112	1.4	18	228	1.5
Russia	15	111	1.4	7	498	3.3

Source: Own calculations based on WTO data: [www.wto.org/statistics].

Analysis of the share of intermediate goods in the trade of individual national economies allows deepening the diagnosis regarding the nature of the specialization. In Asian countries, the share of intermediate goods in imports is more than 10 percentage points higher than in exports. This leads to the conclusion about the concentration of the analysed countries to a greater extent on the processing and assembly of finished products. Importantly, 64% of imports of intermediate goods



in these countries come from the Asian continent itself. This means that most production networks involving Asian companies are rather regional in nature, and not global. A similar conclusion can be drawn with regard to Europe, where more than 70% of trade in goods takes place within the continent. The situation is different in North America, where only 39% of trade in intermediate goods takes place on the continent. Key suppliers of these products to the North American markets are Asian countries [WTO, IDE-JETRO 2011].

Since the most dynamic exporters in the world originate from Asia, one might want to look closer at them. As mentioned above, in Asian countries (as a group) imports of intermediate goods are greater than their exports. Again, however, China is primarily responsible for this result<sup>6</sup>. If one takes into account that Chinese imports is 1/3 imports of intermediate goods on the continent, the specification of specialization of the economy as the main “assembler” in the region is not abuse. Specializing in this function within the framework of global value chains is broadly consistent with the comparative advantage determined by the relatively low labour costs.

The results of the research cited in the second section indicate the existence of a significant degree of overlap of trade between China and the US, which would allow to suppose that the comparative advantage of China is evolving. The above-mentioned data on trade in intermediate goods show that indeed, the exchange can be intra-industry, but still consistent with the level of employees' qualifications. That assertion may not, however, be inferred from the traditional theory of international trade in its pure form.

Grossman and Rossi-Hansberg [2008] postulate, necessary in these circumstances, the paradigm shift from the traditional analysis of final products. Instead, they propose the concept of trade in tasks, arguing that the movement abroad of certain stages of the production process is so long profitable until specific to the operations cost of *offshoring* is less than the difference in the levels of wages between locations. The authors see the trade basis in differences between countries, but their exploitation takes into account the specifics of each task. As a result, highly developed economies focus on the tasks in which they have comparative advantage adjusted for the costs of trade, enabling them to maintain the productivity growth.

The practical issue accompanying the trade in intermediate goods within the framework of global value chains is the aforementioned revaluation of world trade. According to calculations by UNCTAD as a result of multiple transfer of parts and components across borders the value of world exports of goods and services in 2010 was overstated by more than 1/3 of their added value [UNCTAD 2013, p. 125].

<sup>6</sup> This finding, although to a slightly lesser extent, also applies to India. China, India and Vietnam are the most dynamic importers of semi-finished products in the world, with an annual growth rate of imports of the products concerned at the level between 12 and 16%, twice the average for the world at 7% [WTO 2013]

This is because in terms of expansion of global value chains, exports measured classically, apart from the added value generated in the country, also includes foreign value added contained in imported intermediate goods. Domestic value added is also included in the exports of trading partners, if they process parts and components from the country into final goods which are the subject of further export. It is also possible that the national value added “returns” in imported products (Figure 2 and 3).

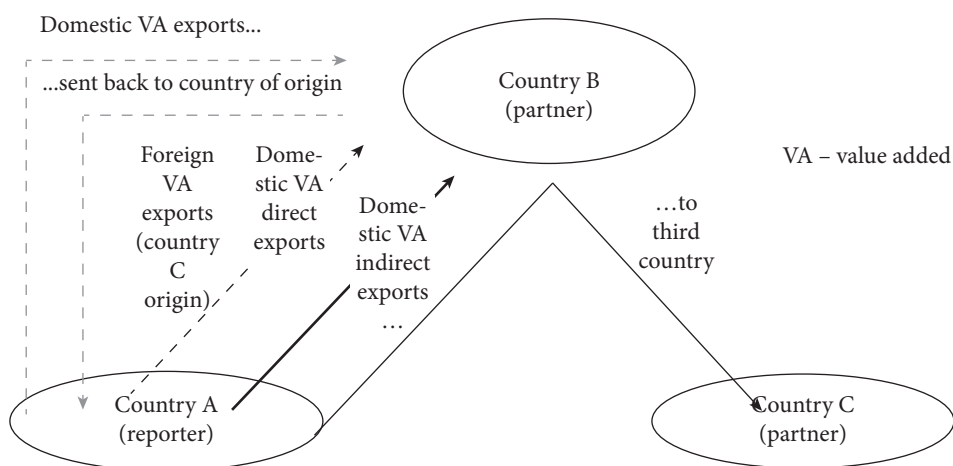


Figure 2. Components of gross flows of exports of country A to trading partners B and C

Source: [WTO 2014a, p. 83]

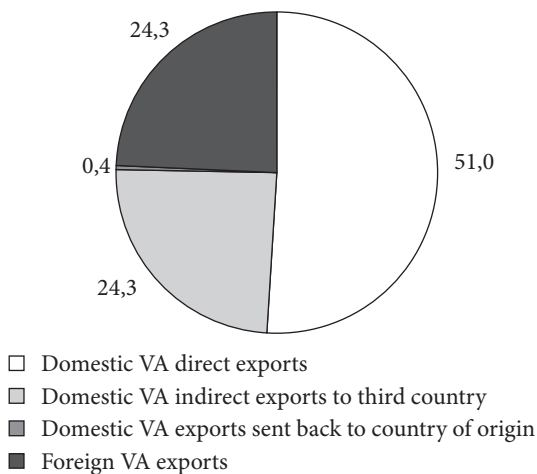


Figure 3. The percentages of individual components of export flows (estimates on the global level)

Source: Own calculations based on [WTO 2015, p. 151]

Only the direct export of domestic value added, which is a little more than half of world exports, is measured properly with the commonly available statistics. The remaining components consist of products with different degrees of processing moved between the borders more than once. In the cross-section of countries, revaluation which occurs as a result of the measurement of exports in gross terms applies in particular to the economies of developed countries<sup>7</sup> (Figure 4). In the group of developing economies it is smaller, with the exception of Singapore and (to a much lesser extent) of Hong Kong, due to the large share of re-exports in these economies. With regard to China, the largest and most influential player in world exports, the share of foreign value added was estimated at 32% [WTO 2015, p. 150]. However, it seems that it is mainly the size of the internal economy acting towards reducing it. If we also take into account the indirect value-added exports to third countries, the share of the Middle Kingdom in global value chains reaches almost 50%.

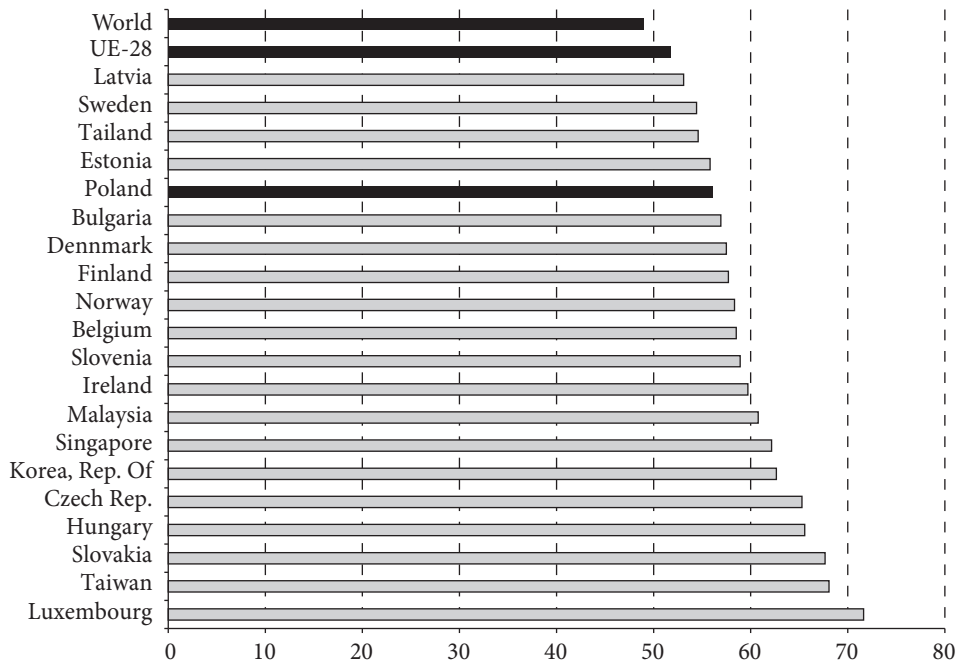


Figure 4. Twenty economies with the highest shares in global value chains in 2011\*

\*Calculated as the sum of the participation of all components of export flows listed in Figure 2, without direct VA exports

Source: Own calculations based on: [WTO 2015, p. 151]

<sup>7</sup> The exception is the US, where the share of foreign value-added in exports stands at twice lower than the world average [UNCTAD 2013, p. 129]. It seems that this is primarily affected by the large size of the economy, which facilitates the parallel forming of the internal value chains and provide access to more resources.

Johnson and Noguera [2012] estimate that the ratio of the value added to the value of world exports of goods and services for the years 1970 to 2009 fell by 10 percentage points. The decline in the manufacturing sector was even stronger, because it was as much as 19 percentage points. Two-thirds of these declines took place after 1990. In the cross-section of countries, the strongest expansion of trade in terms of value added took place in the economies undergoing transformation. According to WTO estimates, carried out with the measures proposed by Johnson and Noguera, Poland (next to Hungary and the Czech Republic) was among the economies in which the share of domestic value added in exports has decreased over the years 1995–2007 to the greatest extent, by almost 20 percentage points. Due to the high output level, described marker is formed according to the latest data at a level similar to the world average (approx. 70%) and the results of such countries as Sweden and Germany, while in the Czech Republic and Hungary only slightly exceeds 50% [WTO 2013, pp. 83–84].

### 3. The move towards more perfect measure of trade in terms of expansion of global value chains

While at the conceptual level offering a paradigm shift, boiling down to deviation from the analysis of product trade to trade in tasks is convincing and catchy, it is difficult in practice due to a still limited number of relevant statistics. Recently there are more research studies whose authors tend to make possibly reliable estimates, while also proposing interesting measures. As a rule, however, they are limited to specific countries and industries. Developing appropriate ways to measure trade in tasks, so as to make reliable global estimates is now one of the priorities of the work of the forums, among others, WTO and OECD [WTO 2013; Lanz, Miroudot and Nordås 2011].

Trade in global value chains can be measured basically in four ways [Daudin, Riffart and Schweisguth 2011]. The first involves measurements on the basis of information coming directly from enterprises<sup>8</sup>. This type of data is collected in a few countries and with regard to a limited number of companies. Their possible extrapolation at the global level would be thus burdened with a large error. Attempts to create more micro data databases have recently been undertaken by EU Eurostat

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<sup>8</sup> The most spectacular and well-known case studies of companies which organize their activity according to the business model in question relate to companies: Apple (producing in this way their iPods, iPhones and iPads), Mattel, known for globally produced Barbie dolls, and Nokia. Already in the World Trade Report (annual flagship publication of WTO) in 1998, it was pointed out that only 37% of the value of an American car is produced in the United States. Data coming directly from the companies are very precise and thus valuable to illustrating the business model. The relatively small sample, however, makes it impossible to generate reliable estimates for the world.

and the Mexican INEGI. They compile information from questionnaires filled out by the companies and commercial documents accompanying the individual business transactions. The construction of such databases, however, is still a very big challenge, not only because of the costs that accompany it. The project is also hindered by far-reaching rigors of statistical confidentiality in some countries<sup>9</sup>.

The second way of estimating trade within global value chains uses customs statistics [e.g. Swenson 2005]. In order to stimulate exports in many developing countries, the practice is exemptions from import duties when imported semi-finished products are further used for export production. Some developed countries use exemptions on imported finished products, if they contain native components. The limitation of this method of estimation of trade carried out within the framework of global value chains is a barrier to access to detailed data.

In terms of the third method, the trade flows realized in global value chains are estimated using the SITC or BEC classification, allowing the distinction between intermediate and finished products [Athukarola and Yamashita 2006]. This method is relatively easiest to implement due to high availability of data. The biggest limitation, however, is the fact that certain products (depending on conditions) may be simultaneously final goods and intermediate products subjected to further processing. If recognising the good with the specific code as an intermediate product is a subjective judgment, it is difficult to consider the discussed method fully objective.

The fourth method involves estimating the “value added trade” global Input-Output tables arising on the principle of combining I-O matrix for the individual national economies with flows of intermediate and final goods and services. Constructing such a table for all countries in the world would allow to trace the value chains for each final product sold in each country. As a result, it would be possible to decompose the value of a product to value added in different sectors and countries that have directly or indirectly contributed to its production. The tables available today are far from perfect in many respects. They include a limited number of countries, the aggregation of sectors used in them is quite arbitrary, and trade flows are recognized still only in a bilateral system. So it is not possible to reproduce the entire production network, which involves more countries.

The first table of such kind – AIO (Asian Input-Output Table) was proposed by Japanese institute IDE-JETRO. Due to the rapid growth of foreign outsourcing in the Japanese enterprises, IDE-JETRO studying this phenomenon already in the eighties became interested in design of a tool to allow the estimation of the analysed phenomenon. AIO table included nine Asian countries<sup>10</sup> and the United States and 76 sectors of production [WTO, IDE-JETRO 2011]. Thanks to the table it was possible

<sup>9</sup> In the European Union, one of the countries with far-reaching rigors of statistical confidentiality is Poland.

<sup>10</sup> These are the following countries: Japan, China, South Korea, Singapore, Indonesia, Thailand, Malaysia, the Philippines and Taiwan.

to establish and further to track changes in the so-called “vertical specialization” of individual economies. This name (following the pioneering work of Hummels, Ishii and Yi [2001]) determines the value of imported parts and components used in export production, by which the value of exports must be corrected in order to obtain a “purified” measure of the flow of exports.

At the global level, the first attempt to construct a similar table, using the official statistical data sources was taken under the WIOD initiative (World Input Output Database), funded by the European Commission under the Seventh Framework Programme. The initiative resulted in the development and making available in April 2012 of the “World Input Output Database”. The table includes a total of 40 national economies<sup>11</sup> and the model estimates for the “rest of the world”<sup>12</sup>. It includes 35 industries.

Another ambitious project, which should enable the accurate estimation of the trade using the concept of value added is endorsed by WTO and OECD cooperating in this regard<sup>13</sup>. Within its framework a global I-O table is being developed, including 56 countries and 37 industries responsible for over 95% of global production. It should enable the diagnosis of bilateral flows and balances calculated on the basis of value added<sup>14</sup> as well as the contribution of individual economies to global production systems.

In a joint project of the WTO and OECD, a special index of participation in global value chains was also developed. It is calculated on the basis of the sum of foreign value-added exports increased by the value added in the country and increasing exports of other economies<sup>15</sup>. Its usefulness in determining the extent of penetration of individual economies by global value chains, however, remains limited [cf. Park, Nayyar and Low 2013]. It may so happen that the two countries for which the index will take the same value, through other positioning in the global chain (design → production → marketing and sales) will draw varied benefits on this account. A full evaluation of participation of countries in global value chains should therefore also take into account the position (role) in the network, which requires the development of further measurement tools.

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<sup>11</sup> These are all the European Union countries (except Croatia) and the biggest exporters in the world, including the US, China, Canada, Russia, Brazil, Mexico and South Korea. The database is available on the website: [www.wiod.org](http://www.wiod.org).

<sup>12</sup> At the time of writing the article, the latest version of the database, made available in November 2013, covered the years 1995–2011.

<sup>13</sup> Work on the development and improvement of a common database of WTO and OECD is conducted within the framework of a broader initiative “Made in the World”. In the context of expansion of global value chains urgent corrections are also required by the WTO rules of origin. Developing a better measure of trade flows with the use of added value should allow for more precise formulation of these rules than the general statement that the product was made, where its major processing was made.

<sup>14</sup> If, as the basis for calculating trade deficit in the US – China only added value in individual economies is taken, it would turn out to be by 28% smaller than calculated taking into account the total value of bilateral trade [WTO 2013, p. 86].

<sup>15</sup> Such an indicator for China stands at 59% [UNCTAD 2013, p. 132].

## Conclusions

Architecture of world trade in recent decades has clearly been changing. The traditional measures used to describe the development trends on the global markets, however, reveal only some of these changes. As demonstrated in section two of the study, part of the inference with the use of traditional measures may even be wrong. The growing importance of developing countries in world trade, although objectively it exists, however, only applies to a few dynamic economies. In addition, it remains poorly calculated, as export measured by value of exported goods does not take into account the fact that a large part of them has been produced with the use of imported intermediate goods, which are already at least once included in the statistics of global exports. Gross data application and analysis of flows of exchanged products, without taking into account how much of their value was created in the exporting country could further lead to erroneous generalizations and undermine the sense of the available theoretical justifications.

The progressive fragmentation of production causes the departure from considerations at the product level, and allows to proceed to the analysis of individual functions (tasks) in the value chain. Only such a research perspective enables correct diagnosis of the base of trade (the sources of comparative advantage of the country), the scope of participation in world trade, as well as an assessment of the benefits derived from it.

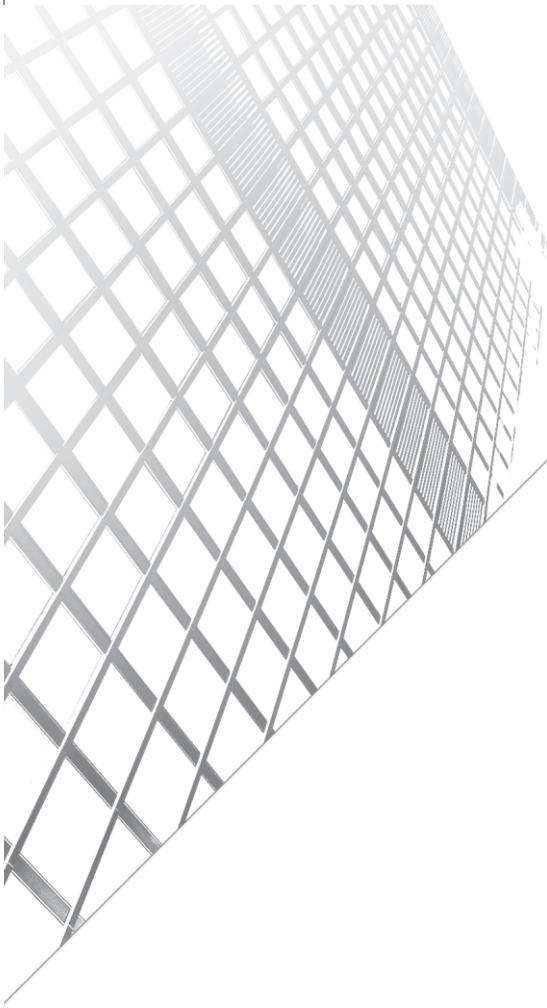
This postulate, easy to justify on the conceptual level, however, still remains difficult to implement in practice. Even though work on the construction of alternative statistics in recent years has significantly intensified, it still remains at an early stage, requiring numerous revisions, additions, and above all, the extension to more countries. However, they are necessary to reliably describe the evolution of world trade, enclose it in a solid theoretical framework, and to formulate appropriate recommendations for policy makers in international trade.

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# From Global Perspective to Regional Problems



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## Science-industry cooperation vs. innovativeness of Polish NUTS-2 regions

### Introduction

The literature emphasizes that cooperation between the science and business sectors is one of the conditions for building a knowledge-based economy, thus raising innovation and competitiveness of the economy at regional, national or international level [OECD 2015, 2002; Perkmann, Tartari and McKelvey 2013]. Without building the foundations of the knowledge-based economy in terms of effective mechanisms of knowledge generation, and especially its implementation in economic practice in the field of new innovative solutions, it seems difficult, if not impossible, to maintain the high competitive advantage of modern economies.

Science-business cooperation is understood as different types of interactions (direct and indirect, formal and informal) occurring between the business sector and the sector of scientific research, providing mutual benefits. Years of experience show that this type of relationship is difficult to organize, because in practice, this often means the cooperation of representatives from two separate worlds. In the framework terms, on the one hand we have a scientist working in the long term perspective, focused on understanding the world, wanting to seek answers to difficult questions, for whom the main objective is the scientific prestige, and on the other hand, we have an entrepreneur seeking in the short term to achieve economic profit, acting under the pressure of time and having quite a difficulty understanding bureaucratic behaviour in the scientific community. Existing differences in the approach to the tasks undertaken and the nature of the work lead to a kind of communication gap between the two sectors. Its causes should be sought in academic values and career model and evaluation of a researcher, on the other hand – in business culture, market priorities and short term business decision-making by entrepreneurs [Matusiak 2010, p. 208]. Practical contact of these two different

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philosophies often triggers the creation of various types of barriers to cooperation which are not easy to overcome.

The issue of strengthening the links between science and business is present in the Strategy for smart, sustainable and inclusive growth (Europe 2020), which is a benchmark for other strategic documents adopted at EU level or at national level in Poland. According to the EU's Europe 2020 strategy, cooperation of science and business is considered as one of the tools for implementing the Innovation Union flagship initiative. At the EU level, therefore, knowledge partnerships are supported and links are strengthened between education, business, research and innovation. At the national level, Member States must, in turn, reform national and regional systems of R&D and innovation activities, to foster the development of excellence and smart specialization, as well strive for closer cooperation between universities, research community and business [Komisja Europejska 2010].

Polish economy is characterized by a relatively low level of innovation. It is evidenced by its position in the rankings of innovation, such as the *Innovation Union Scoreboard 2015*, *Regional Innovation Scoreboard 2014* or the *Global Innovation Index 2015*. In this context, of particular importance in the economy is the use of tools that would contribute to raising the level of that innovation. Among them, an important role is played by tools for strengthening links between science and business.

The aim of the study is to examine the importance of science-industry cooperation in the strategic documents of selected Polish regions in the context of their low level of innovation. The main objective of the paper is achieved through the following specific objectives: 1. The literature review in terms of the science-business cooperation forms and its role for regional development; 2. Determining the level of innovativeness of Polish NUTS-2 regions in the light of the latest statistical data with the use of synthetic measure of development (*SMD*); 3. Overview of regional innovation strategies for two of the most innovative Polish regions for the presence of issue of science-industry cooperation. Research methods: descriptive analysis, analysis of strategic documents, statistical analysis.

## 1. Science-business cooperation in the light of the theory

Interaction between universities and enterprises takes various forms, which are associated with both the commercialization of results, and free transfer of knowledge. There are a number of classifications in the literature. Perkmann and Walsh [2007, pp. 262–263] made a typology of links between science and business, taking into account the extent of involvement of individual entities in the relationship. Research services and research projects were classified by them as a relationship

with a strong character, called relations, academic entrepreneurship and the transfer of human resources (for mobility) as the relationship of average character and the commercialization of intellectual property as a relationship with a weak character. The authors noted here that the use of scientific publications, participation in scientific conferences and networking may take the form of links of various kinds.

Research on the links between science and business are focused mostly on the transfer of intellectual property (patents, licenses, commercialization), while according to the latest results the nature of links between these two spheres is much more diverse [Perkmann and Walsh 2007, p. 262; Perkmann et al. 2013, p. 423]. Numerous channels or mechanisms have been identified, through which information, knowledge and other resources are exchanged or jointly produced by the sector of science and business [e.g. Weresa 2007; Dominik 2013].

An interesting typology of links between science and business, known as types of knowledge interaction between universities and businesses, was proposed by Schartinger and colleagues [2002] characterizing them according to three criteria: formalization of interaction, transfer of tacit knowledge and personal contacts in the context of ongoing relationships (Table 1). The different types of knowledge interactions have thus been described in terms of whether the criterion occurs (+ sign in the table), occurs at different levels (+/- sign in the table) or does not occur (-sign in the table).

Table 1. Types of knowledge interaction between universities and enterprises\*

Types of knowledge interaction	Formaliza- tion of interaction	Transfer of tacit knowledge	Personal contact
Employment of graduates by firms	+/-	+	-
Conferences with firm and university participation	-	+/-	+
New firm formation by university members	+	+	+/-
Joint publications	-	+	+
Informal meetings	-	+	+
Joint supervision of Ph.D. and Master theses	+/-	+/-	+/-
Training of firm members	+/-	+/-	+
Mobility of researchers between universities and firms	+	+	+
Sabbatical periods for university members	+	+	+
Collaborative research, joint research programs	+	+	+
Lectures at universities, held by firm members conducted by business	+	+/-	+
Contract research and consulting	+	+/-	+
Use of the university facilities by firms	+	-	-
Licensing of university's patents by firms	+	-	-
Purchase of prototypes developed at universities	+	-	-
Reading scientific publications, patents, etc.	-	-	-

\* +: interaction usually involves a formal agreement, transfer of tacit knowledge and personal contacts; +/-: varying levels of formal agreement, transfer of tacit knowledge and personal contacts; -: interaction usually includes the lack of a formal agreement, lack of transfer of tacit knowledge and personal contacts.

Source: [Schartinger et al. 2002, p. 305].

Form of cooperation between the science and business sectors is moreover the result of conditions in which both indicated sectors operate. The results of the research concerning corporate behaviour in relation to higher education indicate that the chosen form of cooperation depends on the location and nature of the business. Regional and national companies often establish permanent bilateral relations with the university, without including third partners in the cooperation. Foreign companies are characterized by building more complex and multilateral relationships. In addition, small companies generally less frequently and less intensively than larger companies use external sources of knowledge, but just as often from scientific publications [Olechnicka 2012, pp. 71–72].

It is interesting to look also at cooperation between science and business from the point of view of the regional importance of the various forms of cooperation. According to research, the use of licenses is much less related to the location, while own commercialization ventures of scientific institutions, in particular the creation of spin-offs, are local in nature. Businesses establishing own companies often remain close to the source of knowledge, i.e. the institution from which the founder of the spin-off originates. The university gives these companies an advantage in the form of qualified staff, expertise and specialized equipment. In addition, employees establishing the spin-offs, divide their time between their own company and the university, hence the geographical proximity in this context is of great importance [Olechnicka 2012, p. 73].

It should also be noted that the cooperation of companies with scientific institutions is not always formal in character and is often implemented in the form of informal contacts and contracts. Thus, informal cooperation takes the form of direct contacts of the academic staff with representatives of enterprises, mainly based on informal communication process. Because of the informal nature of those relationships they are insufficiently explored, and thus sometimes underestimated in the whole science-business relationship. The literature emphasizes, however, that informal cooperation is often the starting point for formalized cooperation between the science and business sector, so it should not be depreciated [Olechnicka 2012, p. 74].

In summary of the overview of forms of cooperation between the science and business sector, it is essential to pay attention to the diversity of its tools, as well as a large role of both formal and informal forms of this collaboration.

## 2. Innovativeness of Polish regions at NUTS-2 level in the light of the most recent statistical data

The key to assessing the degree of innovation of the Polish economy is to focus on innovation rankings. Particularly noteworthy is the *Innovation Union Scoreboard*

2015, *Regional Innovation Scoreboard 2014* and the *Global Innovation Index 2015*. These rankings, based on specific innovation indicators allow to compare the degree of innovation of national economies. According to the *Innovation Union Scoreboard 2015* report, the Polish economy, based on 25 indicators of innovation, has been included, along with 12 other European Union Member States<sup>2</sup> to the group of countries with moderate innovation of the national economy (*Moderate innovators*). This group includes countries where the value of the synthetic innovation index ranges from 50% to 90% of the average for the EU. Other groups highlighted in the ranking are *Innovation leaders* (the value of the summary indicator by more than 20% in excess of the EU average), *Innovation followers* (the value of the summary indicator less than 20% above but less than 10% below the average level for the EU) and *Modest innovators* (value of the summary indicator amounting to less than 50% of the EU average) [*Innovation*, p. 10]. On the other hand, according to the *Global Innovation Index 2015* including 91 innovation indicators Poland was in the 46th place out of 141 analysed countries [*The Global Innovation*, p. 16]. Equally interesting information is provided by *Regional Innovation Scoreboard 2014*. According to the report, Polish regions at NUTS-2 level are characterized by a relatively low level of innovation. Of all the regions only Mazowieckie, Podkarpackie, Małopolskie, Śląskie and Dolnośląskie in 2014 were characterized by a moderate degree of innovation. The overall rate of innovation in other regions did not exceed 50% of the average for the European Union [*Regional Innovation Scoreboard 2014*, p. 2]. Noteworthy, however, is the fact that in comparison to 2012, there was an increase in the value of total innovation index in Podkarpackie, Małopolskie, Śląskie and Dolnośląskie provinces. In 2012, only Mazowieckie province was in fact considered to be a region with a moderate degree of innovation [*Regional Innovation Scoreboard 2012*, p. 6].

A report prepared for the European Commission [Davey et al. 2013] also shows that Poland takes one of the last places in Europe in the development of science and business cooperation. Student mobility and lifelong learning are the most common forms of science-business cooperation in Poland (they respectively reach a value of 5.5 and 5.2 on a 7-point scale), while the commercialization of research results found itself in last place (with 4 compared to Europe, which reached a value of 5.4 on a 7-point scale).

In this paper an attempt was made to create a synthetic measure of development (SMD) in innovation of Polish provinces (regions at NUTS 2 level), based on the latest statistical data from the Local Data Bank (data for 2013). Analysis of innovation of Polish regions was carried out in five stages. In the first step the variables were selected for testing based on the correlation coefficient. The analysis

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<sup>2</sup> Croatia, Cyprus, Czech Republic, Estonia, Greece, Hungary, Italy, Lithuania, Malta, Portugal, Slovakia and Spain.

Table 2. Diagnostic variables describing innovativeness of NUTS-2 regions in Poland

Subject scope	Diagnostic variable	Variable symbol
Innovative activities	Industrial enterprises introducing new or significantly improved products to the market (employing 50 to 249 employees)	X1
	Industrial enterprises introducing new or significantly improved processes (employing 50 to 249 employees)	X2
	Industrial enterprises introducing new or significantly improved processes (employing more than 250 employees)	X3
	Innovative industrial enterprises in total	X4
	Innovative industrial enterprises (foreign ownership)	X5
	Industrial enterprises introducing new or significantly improved products (public sector)	X6
	Industrial enterprises participating in cluster initiatives or other formal type	X7
	Industrial enterprises participated in innovation activities cluster or other formal types of co-operation in % of the innovation active enterprises (employing 10 to 249 employees)	X8
	Service sector enterprises with expenditures on innovation activity	X9
	Industrial enterprises with expenditures on innovation activity	X10
	Industrial enterprises that cooperated in terms of innovation activity in % of total enterprises (employing 10 to 49 employees)	X11
	Industrial enterprises that cooperated in terms of innovation activity in % of total enterprises (employing 50 to 249 employees)	X12
	Industrial enterprises that cooperated in terms of innovation activity in % of total enterprises (employing more than 250 employees)	X13
	Total service sector enterprises that cooperated in terms of innovation activity in % of total enterprises	X14
	Service sector enterprises that cooperated in terms of innovation activity in % of total enterprises (employing 50 to 249 employees)	X15
	Service sector enterprises that cooperated in terms of innovation activity in % of total enterprises (employing more than 250 employees)	X16
	The share of sales of new / significantly improved products in industrial enterprises in the value of total sales	X17
	The share of net revenues from sales of innovative products to the market in the industrial enterprises in total net revenues from sales (employing more than 250 employees)	X18
	The share of net revenues from sales of innovative products in the industrial enterprises (foreign ownership) in total net revenues from sales	X19
	The share of net revenues from sales of innovative products to the market in the industrial enterprises (foreign ownership) in total net revenues from sales	X20
	The share of net revenues from sales of innovative products only for the industrial enterprise products in total net revenues from sales (employing 10 to 49 employees)	X21
	The share of net revenues from sales of exported innovative products in the industrial enterprises in total net revenues from sales (employing 10 to 49 employees)	X22



	The share of net revenues from sales of products in entities classified to high and medium-high technology (employing more than 9 employees)	X23
	Service sector enterprises introducing new or significantly improved processes	X24
	Industrial enterprises introducing new or significantly improved products (employing more than 250 employees)	X25
	The share of net revenues from sales of exported innovative products for the market in the industrial enterprises in total net revenues from sales	X26
	The share of net revenues from sales of innovative products to the market in the industrial enterprises in total net revenues from sales (employing 50 to 249 employees)	X27
	The use of ICT in enterprises in non-financial sector in total (enterprises using computers)	X28
	The use of ICT in enterprises in non-financial sector in total (enterprises having a website or home page)	X29
	The use of ICT in enterprises in non-financial sector in total (enterprises using own website or home page to product catalogues or price lists)	X30
	The use of ICT in enterprises in non-financial sector in total (enterprises receiving orders via computer networks)	X31
Information society	The use of ICT in enterprises in non-financial sector in total (enterprises using the Internet in their dealings with public administration in total)	X32
	The use of ICT in the financial sector in total (enterprises using own website or home page to product catalogues or price lists)	X33
	The use of ICT in the financial sector in total (enterprises using the Internet in their dealings with public administration in total)	X34
	The use of ICT in the financial sector in total (enterprises equipping their employees handheld devices enabling mobile access to the Internet)	X35
	The use of ICT in the financial sector (enterprises having broadband Internet access)	X36
	Enterprises conducting research and development activities in the field of biotechnology (protection of animal health)	X37
	Enterprises conducting research and development activities in the field of biotechnology (genetically modified agricultural biotechnology)	X38
	Enterprises conducting research and development activities in the field of biotechnology (non-genetically modified agricultural biotechnology)	X39
	Enterprises conducting research and development activities in the field of biotechnology (bioinformatics)	X40
Biotechnology	Enterprises conducting research and development activities in the field of biotechnology (other areas of activity in the field of R&D)	X41
	Enterprises with production activities in the field of biotechnology (health care using rDNA technology)	X42
	Enterprises with production activities in the field of biotechnology (health care without using rDNA technology)	X43
	Enterprises with production activities in the field of biotechnology (protection of animal health)	X44
	Internal expenditures on research and development in the field of biotechnology in scientific units (capital expenditures on fixed assets)	X45
	Areas of activity in the field of biotechnology indicated by scientific units (non-specific use)	X46
	Internal expenditure on biotechnology in enterprises (funds from the state budget and from private non-profit institutions)	X47

excluded variables that were characterized by correlation greater than or equal to 0.7. The procedure allowed the exclusion of the variables that presented information identical, from the statistical viewpoint. Among the 289 statistical characteristics 47 variables classified for further analysis described the innovativeness of Polish regions, expressed in innovative activities, information society and biotechnology (Table 2). Individual variables have not been assigned weights. The assumption was made that their relevance to the subject of study is equal. All the characteristics accepted fulfilled the function of stimulant.

In further proceedings, the normalization of variables was made based on the method of unitarisation, according to the formula (1). This method involves the conversion of the absolute values to variables with the fixed unit range of variation. The normalized variables thus take value in the interval [0: 1], which allows to correct the asymmetry of distribution of the variables while retaining their effect on the characteristics studied [Pociecha et al. 1988, pp. 42–43; Poczta-Wajda 2010, pp. 74–75]. The value [1] of standard variable corresponds to the highest value of the variable before normalization (for the stimulant):

$$z_{ij} = \frac{x_{ij} - \min_i \{x_{ij}\}}{\max_i \{x_{ij}\} - \min_i \{x_{ij}\}}, \quad (1)$$

where:

$\max_i \{x_{ij}\}$  – maximum value of the characteristic,

$\min_i \{x_{ij}\}$  – minimum value of the characteristic.

The next stage of the research specified the level of innovativeness of Polish NUTS-2 regions based on *SMD*. For this purpose, using the Euclidean metrics, according to the formula (2), the distance of the surveyed regions from a hypothetical standard was indicated due to the accepted characteristics, i.e. the value [1] [Szamrej 2006, p. 597; Stanisiz 2006, p. 115; Standar and Średzińska 2008, p. 137; Kompa 2009, p. 9]:

$$q_{it} = \sqrt{\sum_{i=1}^p (x_i - y_i)^2}, \quad (2)$$

$$x = (x_1, \dots, x_p),$$

$$y = (y_1, \dots, y_p),$$

where:

$q_{it}$  – Euclidean distance of the variable,

$x_i$  – the variable value,

$y_i$  – value of a hypothetical standard.

Then, based on the value of average (formula 3) and standard deviation (formula 4) for specified Euclidean distances, in accordance with formula (5), the value of synthetic measure for the regions was determined. The  $SMD$  value is in the interval [0: 1]:

$$\bar{q}_t = \frac{1}{n} \sum_{i=1}^n q_{it}, \tag{3}$$

$$S_{qt} = \sqrt{\frac{1}{n} \sum_{i=1}^n (q_{it} - \bar{q}_t)^2}, \tag{4}$$

$$SMD_{it} = 1 - \frac{q_{it}}{q_t + 2 * S_{qt}}, \tag{5}$$

where:

- $\bar{q}_t$  – average for Euclidean distances,
- $S_{qt}$  – standard deviation for Euclidean distances,
- $SMD_{it}$  – synthetic measure of development.

In the last stage of the analytical procedure based on the average value (formula 6) and standard deviation (formula 7) of synthetic measure, the classification of the surveyed regions into homogeneous classes was made describing the degree of innovation of regional economies (Table 3) [Standar and Średzińska 2008, p. 138; Kompa 2009, p. 11]:

$$\overline{SMD}_t = \frac{1}{n} \sum_{i=1}^n SMD_{it}, \tag{6}$$

$$S_{SMD_t} = \sqrt{\frac{1}{n} \sum_{i=1}^n (SMD_{it} - \overline{SMD}_t)^2}, \tag{7}$$

where:

- $\overline{SMD}_t$  – the average for the synthetic measures of development,
- $S_{SMD_t}$  – standard deviation for synthetic measures of development.

Table 3. Classification criteria of innovativeness for NUTS-2 regions in Poland

Group and characteristics of objects studied	Classification criteria
Group I – high level of innovation	$SMD_{it} \geq \overline{SMD}_t + S_{SMD_t}$
Group II – medium level of innovation	$\overline{SMD}_t + S_{SMD_t} > SMD_{it} \geq \overline{SMD}_t$
Group III – low level of innovation	$\overline{SMD}_t > SMD_{it} \geq \overline{SMD}_t - S_{SMD_t}$
Group IV – very low level of innovation	$SMD_{it} < \overline{SMD}_t - S_{SMD_t}$

Source: [Standar i Średzińska 2008, p. 138; Kompa 2009, p. 11].

As the result of the research procedure, the degree of innovativeness of Polish regions NUTS-2 was determined, and then their classification was made into one of four distinguished classes corresponding to the innovation of the regional economy (Table 4). The highest value of the synthetic measure for the studied characteristics was indicated for Mazowieckie. The first typological group also included Śląskie region, but the region is characterized by much lower levels of innovation than Mazowieckie province. The largest typological group is the second group corresponding to the medium level of innovation. This group included, in the order of the value of synthetic measure, the provinces: Małopolskie, Dolnośląskie, Podkarpackie, Wielkopolskie, Podlaskie and Opolskie. This group is characterized by relatively low volatility of the synthetic value of nearly 15%, and a significant difference in the level of innovation in the region from the lower and upper range limit. In turn, the third and fourth groups included four provinces. The third group, corresponding to the low innovative regional economy, includes the provinces: Lubelskie, Łódzkie, Pomorskie and Kujawsko-Pomorskie. This group has the lowest degree of differentiation of the level of innovation ratio of slightly more than 8%. The fourth group describing the lowest level of innovation in the regional economy included Zachodniopomorskie, Świętokrzyskie, Lubuskie and Warmińsko-Mazurskie provinces. This group has the highest coefficient of variation of synthetic measure. It is

Table 4. Innovation of NUTS-2 regions in Poland

Typological group	Region	SMD	Rank
I	Mazowieckie province	0.402888165	1
	Śląskie province	0.313680138	2
II	Małopolskie province	0.283179207	3
	Dolnośląskie province	0.279011698	4
	Podkarpackie province	0.257031988	5
	Wielkopolskie province	0.234873678	6
	Podlaskie province	0.203172010	7
	Opolskie province	0.201221147	8
III	Lubelskie province	0.197279878	9
	Łódzkie province	0.181105234	10
	Pomorskie province	0.173335071	11
	Kujawsko-pomorskie province	0.161534426	12
IV	Zachodniopomorskie province	0.091713904	13
	Świętokrzyskie province	0.090239071	14
	Lubuskie province	0.056710285	15
	Warmińsko-mazurskie province	0.033253406	16

in fact 41.5%. Moreover, the regions included in the fourth typological group are characterized by a marked difference in the level of innovation for the lower and upper range limit.

Noteworthy is also the fact that the difference in the level of innovation in the region from the lower and upper range of the first (Śląskie) and second (Małopolskie) and second (Opolskie) and third (Lubelskie) typological group is not as significant as the difference in innovation level between the last region classified in the third group (Kujawsko-Pomorskie) and the first region in the fourth typological group (Zachodniopomorskie). This shows a slight differentiation of the lower and upper limit level of innovation in regions classified as first, second and third typological class, and in particular the regions of the second and third group, and a much lower level of innovation for the regions included in the fourth group in relation to the regions of the third group.

### 3. Science-business cooperation in policy documents of selected Polish NUTS-2 regions

In the context of the ongoing discussion in EU forum on the shape of European cohesion policy the Europe 2020 strategy was adopted, outlining a vision of Europe in 2020, as a smart, sustainable and socially inclusive area. In relation to this document, the regional authorities are obliged to prepare research and innovation strategies for smart specialization in order to use European Union funds more efficiently and in a manner increasing synergies between different EU policies. This means strengthening regional innovation systems, maximizing the flow of knowledge and dissemination of the benefits of innovation at regional level.

In this section, an overview of regional innovation strategies in the most innovative Polish regions was made for the presence in the records of the strategic objectives and tools of collaboration of science and business sectors. According to analysis carried out in Section 2 two of the most innovative provinces were taken into account belonging to the first typological group: Mazowieckie and Śląskie (Table 5). As noted above, both regions, although included in the same typological group, are characterized by different values of *SMD*.

In the case of both provinces smart specializations chosen at the regional level have been included as a component of regional innovation strategies. Both analysed regional innovation strategies are characterized by numerous references to the issue of cooperation between science and business, both in terms of operational objectives of this collaboration and the proposed courses of action to achieve the stated objectives (Table 5). In the case of the objectives set out in the Regional Innovation Strategy (RIS) of Mazowieckie, it is noteworthy to emphasize the role of

Table 5. Science-industry cooperation in regional innovation strategies of two most innovative Polish regions

Region	Name of the strategic document	Objectives of science-business cooperation	Recommended actions
Mazowieckie	Regional Innovation Strategy for Mazowsze until 2020	<p>Development of forms of cooperation in relations between business, science and environment, which guarantee tangible results for the regional economy</p> <p>Development of network structures (including clusters, producer groups)</p> <p>Intensification of research, the results of which correspond to the needs of entrepreneurs and contribute to the development of cooperation and networking in the region</p> <p>Increase in activity of scientific institutions, enterprises and clusters of Mazowsze region in the international arena</p> <p>Increase in funding for innovative projects of small and medium-sized companies (including spin-offs founded by graduates and university staff)</p>	<p>Actions aimed at eliminating obstacles to cooperation, motivation to cooperation and the development of social capital: 1. Support for projects and activities in the field of commercialization of research results and technology transfer. 2. Organization of innovation trade fairs, exchanges, seminars, conferences conducive to initiating and strengthening cooperative relations between the companies, entities of science and business environment. 3. Support for projects in the field of building and development of cooperation networks and platforms of agreement between operators of business, science and public administration</p> <p>Stimulating the creation and development of cooperation networks between companies and institutions operating in Mazowsze</p> <p>1. Promotion and support of research units and enterprises in determining research areas and problems. 2. Support for joint research projects carried out by scientific entities and entrepreneurs</p> <p>Stimulating international cooperation links of innovative character</p> <p>Support for the creation of special purpose companies, spin-offs</p>

Śląskie	Regional Innovation Strategy for Śląskie province for 2013–2020	<p>Supporting changes in the innovation environment strongly cooperating with the knowledge and information production centres on a global scale</p> <p>Achieving excellence in advanced health services, implemented in partnership of clinical centres, research facilities of high technology and innovative companies in the medical engineering and biotechnology</p> <p>Network co-creation and sharing research infrastructures by scientific institutions, universities, enterprises and public institutions</p> <p>Co-creating a network of centres of competence for the development of smart markets</p> <p>High level of participation of the SME sector in collaborative networks of regional and supra-regional reach to increase its share in the smart markets</p>	<p>1. Strengthening the international capacity of actors of the regional innovation ecosystem. 2. Including the entities from the region in the global technology markets. 3. Creating clusters of technological excellence</p> <p>1. Creating a support system for international activities of doctors and communities related to life science and medical engineering. 2. Investing in infrastructure reflecting the contemporary state of the art. 3. Attracting private investment in the sector of innovative life science and medical engineering</p> <p>1. Formation of consortia implementing joint infrastructure projects. 2. Creating project teams in consortium systems</p> <p>1. Mapping knowledge in the area of smart markets. 2. Designation and / or creation of centres of competence (NBCK, FOCK)</p> <p>1. supporting the development of existing networks and clusters operating in the areas of energy conservation, renewable energy, clean coal technologies, transport, ICT, telecommunication and medical technologies in order to internationalize them and obtain the status of the key players on the Polish market and recognized on the world market. 2. support for networks, alliances and clusters interacting with key players on smart markets. 3. Network incubation in promising technological directions</p>
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Source: Own study based on regional innovation strategies of both provinces.

networking, including clusters, also in terms of internationalization of their business, the development of science-business cooperation, which would guarantee tangible effects for the economy and the increase in expenses for the establishment of spin-off companies. In Śląskie region, the key objectives of the science-business cooperation contained in the RIS include a desire to internationalize networking of all partners of innovation in the region, both research facilities, which would become part of a network of competence centres and SME for the purpose of its participation in the smart markets.

It is also interesting to look at the measures proposed at the level of both strategies used to achieve these operational objectives. The RIS of Mazowieckie strongly emphasizes all efforts to support elimination of barriers to science-business cooperation, including increasing social capital at the regional level. Recommended actions, however, are formulated rather on the general level designed to promote / encourage the development and construction of the links between the two sectors. The actions proposed by Śląskie RIS are more detailed, having largely to do with technological development, which is the strong point of the region. Hence, the strategy includes provisions related to e.g. creating clusters of technological excellence, creating a support system in the life science and medical engineering sectors, support for cooperation networks and clusters in selected sectors of regional importance.

## Conclusions

According to the traditional approach, science-business cooperation has been described primarily in the context of the transfer of intellectual property for patents, licenses and commercialization of technology. The scientific work of recent years shows, however, that the range of forms of cooperation between the science and business is much broader, and forms of cooperation not involving transfer of technology prove the wealth of this collaboration, hence they should be also taken into account. Noteworthy is also the fact of various forms of informal cooperation between the two sectors, which also in the literature seems to be undervalued, while its role is significant, often in initiating cooperation of a formal nature.

Cooperation between the science and business sectors as a factor in the competitiveness of the regional economy is of interest not only theoretically, but also practically, which is reflected by highlighting the role of this collaboration in regional development in various kinds of strategic documents, i.e. the Europe 2020 strategy, the regional operational programs, regional innovation strategies. Thus, the intensification of research and development cooperation, and consequently an increase in the degree of innovativeness of the economy should be a particular



focus of the central government, regional and local authorities, businesses and research centres and universities.

Polish economy is still characterized by a relatively low level of innovation, as evidenced by the latest rankings of innovation of EU Member States and regions. The own research conducted on the basis of 47 variables in terms of innovation shows that of all the NUTS-2 regions in Poland, the highest level of innovation is displayed by two provinces: Mazowieckie and Śląskie. However, according to the *Regional Innovation Scoreboard 2014*, these regions compared to EU regions are characterized by only moderate degree of innovation. It seems, however, that cooperation between the science and business sectors can be an important competitive factor of the regional economy in Mazowieckie and Śląskie. The analysis of regional innovation strategies of Mazowieckie and Śląskie carried out for the purposes of the paper in terms of objectives and proposed activities of this collaboration shows that in both cases, both the objectives and actions are widely present.

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# The use of repayable financial instruments in the process of regeneration of degraded urban areas on the example of the JESSICA initiative<sup>2</sup>

## Introduction

One of the main current problems of Polish cities is relatively high levels of socio-economic disparities occurring in urban areas. The existing inequalities, arising from the progressive degradation of the material substance, such as buildings and urban infrastructure, as well as adverse demographic changes, have a negative impact on the local labour market and discourage businesses from investing. The problems related to the growing concentration of adverse effects are apparent not only in large cities serving as agglomerations, but also in the majority of the smaller towns located outside the direct influence of agglomerations. The delegation of a relatively large responsibility for the condition of urban areas to local authorities, in the absence of sufficient legal and financial instruments, limits the possibilities for the desired direction of the process of spatial development of urban areas. The role of spatial planning is not sufficiently recognised in the long-term actions of both the national and municipal authorities, which translates into structural problems of spatial planning [Węclawowicz 2010]. As a result, the urbanization process in the territorial dimension proceeds in an uncontrolled manner, leading to a reduction in the efficiency of the entire settlement system. There is also an apparent lack of a uniform urban policy of the state, which would promote urban development and lead to the use of its potential in the whole country. Urbanization is no longer perceived as a means to desirable socio-economic development. The relatively rapid changes in the urban space, along with limited effectiveness of development policy and spatial policy actions lead to the accumulation of socio-

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spatial diversity. The problems diagnosed in the cities most noticeably include [MRD 2010]:

- depopulation, especially among young, better educated people;
- concentration of poverty, social pathology and social exclusion;
- the ageing population, especially in urban centres;
- loss of existing economic functions for entire cities or districts, including the city centres;
- spatial segregation of the population due to the level of income,
- process of progressive suburbanization and rapid sprawl of urban development (uncontrolled suburbanization);
- housing problems – housing deficit and the loss of usable value of the older housing resources (especially old tenement houses and blocks of flats from the 1960s and 1970s);
- a relatively large share of post-industrial, post-railway and post-military areas in urban space.

The problem of concentration of adverse phenomena does not apply to individual housing estates or areas located on the outskirts, but rather covers entire districts, even those located in city centres. Estimating the actual degradation scale of urban areas in Poland is relatively difficult. The approximate size of degraded areas in need of regeneration is presented in Table 1.

Table 1. Degraded areas in need of regeneration in Poland (2010\*)

Type of degraded area	The area degraded (ha)	Degraded areas in the urban areas (%)	The proportion of degraded areas (%)
Old downtown districts	62,337.3	11.0	51.8
High-rise block housing estates	14,883.4	2.6	12.4
Post-industrial areas	24,034.0	4.2	20.0
Former military areas	4,000.0	0.7	3.3
Former railway areas	15,000.0	2.6	12.5
Total	120,254.7	21.2	100.0

\*It was decided to use the data from 2010, which corresponded to the diagnosis performed for the purpose of, among others, implementation of instruments such as JESSICA.

Source: [MRD 2010; OECD 2011].

It was estimated early in the decade that 4.3 million inhabitants, i.e. approx. 25% of the urban population live in deprived urban areas, including approx. 2.2 million inhabitants in the old central districts and approx. 2.1 million inhabitants in block housing projects [MRD 2010]. The scale of adverse events occurring in degraded urban areas makes them eligible for immediate intervention in both the zoning and operational dimensions [Ziobrowski and Jarczewski 2010; Janas, Jaraczewski and Wańkiewicz 2010]. However, the pace of regeneration actions undertaken so

far does not allow for a change in the situation, and large-scale accumulation of the issues in the urban spaces is beyond the financial capacity of local governments.

Along with membership in the European Union (EU), the countries have encountered new options of obtaining additional funds for this purpose. In 2007–2013, it was decided to test the use of repayable instruments and thus increase the possibility of access to capital for regeneration, through the launch of the JESSICA initiative. The limited amount of available financial resources with the relatively large-scale needs meant that this instrument was launched as an alternative approach to traditional grants, involving the use of financial engineering instruments, in order to undertake more effective and efficient urban regeneration initiatives. This initiative is an instrument of financial engineering which enables the use of EU structural funds in the repayable system, namely through revolving instruments (loans, guarantees), allowing for a better use of structural funds and obtaining the multiplier effect of operations [Memorandum 2006].

Previous experience in the use of repayable financial instruments to execute regeneration projects has been unsatisfactory. This financially highly effective method of using the cohesion policy resources does not always lead to the equally desired results in the socio-economic aspect. Most of the projects previously implemented under the JESSICA initiative appear to be restricted to investments in infrastructure and take into account the comprehensive and integrated nature of the regeneration measures to a very small extent. The scope of the projects is frequently limited to infrastructure investments, thus disregarding the complex nature of the regeneration process as a whole. Such actions result in solutions, which, on the one hand, contribute to the improvement of urban infrastructure resources, but on the other hand – fail to solve the social and spatial problems. These in turn can accumulate and cause the persistence of the crisis conditions. The expected positive outcome may not occur at all.

Therefore, the main objective of this article is to assess the existing solutions used within the JESSICA initiative from the perspective of the model (theoretical) approach to regeneration. The authors intend to examine whether the JESSICA initiative is an effective instrument for improving the situation in deprived urban areas and reducing urban inequalities.

## 1. Regeneration of degraded urban areas

The regeneration process covers a wide range of measures to be taken in degraded urban areas in order to ensure their renewal: starting with the diagnosis of the main problems in the crisis areas and ending with identifying solutions and their implementation in the form of specific actions. This approach makes this concept frequently applicable, especially in the context of the creation of infrastructure

solutions / construction of infrastructure. Consequently, the concept of regeneration is used interchangeably with terms such as renewal, reconstruction, restructuring, renovation, restoration, reclamation and rehabilitation [Kaczmarek 2001]. It should be emphasised, however, that regeneration is a broader concept than all the previously mentioned terms [Ziobrowski and Jarczewski 2010]. It includes all of them and presents the comprehensive nature of the general processes focused on sustainable urban development. Regeneration goes beyond the process of urban renewal, which is often regarded as carrying out the physical changes, as well as beyond the process of urban development, which is in turn identified with the mission and objectives of a properly defined development policy [Roberts 2002].

Regeneration is defined as a coordinated process, run jointly by local authorities, local communities and other stakeholders, which is an integral part of a development policy focused on achieving such objectives as preventing degradation of urban spaces and crisis phenomena, stimulation of the development and qualitative changes through increasing social and economic activity, improvement of living conditions and protection of national heritage, etc. [Kozłowski and Wojnarowska 2011; Rodwell 2012]. This approach primarily emphasizes the need for coordinated action, both public and private, which should be implemented in accordance with the principles of sustainable development. Regeneration plays an important role in the process of reversing economic, social and physical degradation of the urban areas, where it reached such a stage that market forces are no longer sufficient to maintain a path of sustainable development [European Commission 1996]. In the face of such a situation, there is a need for intervention by the public authorities, which are directly or indirectly required to implement a wider range of measures in the areas affected by the accumulation of states of emergency.

When analysing the regeneration process of degraded urban areas, one must keep in mind that its key elements are social aspects. Social sustainability is a basic component of any plan to improve the living conditions of residents. Therefore, regeneration cannot be restricted to re-stimulating economic activity in an area where it has slowed down or even disappeared. This process forces decision-makers to plan and undertake comprehensive action in the dysfunctional areas in order to guarantee the restoration of social functions and enable social integration [Couch, Fraser and Percy 2003]. It should be stressed that the regeneration takes place primarily in a social context. Its primary purpose is social development and this is what the regeneration actions should ensure, including those aimed at modernization of the buildings [GTZ 2003]. However, regeneration measures cannot be undertaken outside the society. The success of public policies and welfare of local community depends on the involvement of citizens in the regeneration process at every stage. It is a factor necessary to ensure the success of regeneration actions.

Roberts points out that the regeneration is a “comprehensive set of integrated vision and actions which leads to the resolution of urban problems and which

seek to bring about the lasting improvement in the economic, physical, social and environmental condition of an area that has been subject to change” [Roberts 2002, p. 17]. Regeneration projects must account for the spatial, social and economic dimensions of urban areas. Failure to do so may lead to ineffectiveness of actions taken, or to achieving unintended results. Focus only on the purely infrastructural renewal of degraded urban areas without providing actions directed strictly at the local community can deepen social stratification and as a result – further persistence or even growth of social polarisation. An important element of this process is a spatial dimension, responsible for the proper matching of actions and measures to the problems accumulated in a specific location. In this context, the implementation of regeneration projects should be guided by an integrated approach, i.e. the one accounting for the implementation of coordinated action in the following areas:

- Spatial – which stresses the importance and the specificity of a given area as a place unique in terms of the existing problems, but also the existing opportunities. The actions undertaken must take into account the specificity of the space and respond in a precise manner to the needs being expressed. This includes the requirement to take into account the long-term planning of space development as a determinant of the sustainable development of urban areas. This dimension should act as a coordinator and a verifier [Markowski 2011] of the undertaken regeneration actions.
- Social – the measures are aimed at preventing social exclusion and occurrence of social pathologies. These are also actions aiming to reverse the negative demographic trends, impoverishment of society or struggle with low levels of education. It is also important to ensure equal opportunities to persons with disabilities, elderly people or those professionally inactive by enabling them to participate equally in social and economic life [Kozłowski and Wojnarowska 2011]. Empowering the society through inclusion of citizens in the decision-making process plays an important role in this dimension, particularly in terms of formulating goals and directions of the regeneration process [Lorens and Martyniuk-Pęczak 2009].
- Economic – which is related to the economic recovery of a degraded area. Actions undertaken in this dimension should lead to the restoration of economic activity, especially the creation of new jobs. To this end, it is necessary to support local entrepreneurs, create incentives for external investors, and attract new residents and users [Kozłowski and Wojnarowska 2011]. The economic dimension also includes economic effectiveness of undertaken measures<sup>3</sup>.

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<sup>3</sup> The authors understand the concept of economic efficiency as both the financial efficiency (narrower category) and economic efficiency (which is a broader category). Financial efficiency is related to the profitability of the actions undertaken, and therefore indicates whether the investment will be profitable and will bring a certain return. Due to the public nature of many regeneration measures, it is not a necessary prerequisite for success of an investment. Economic efficiency in turn broadens

Regeneration is inherently a public intervention, the aim of which is to restore the functioning of market mechanisms in the dysfunctional areas (cf. figure). Successful regeneration is the result of integration of actions and concentration of resources in the areas requiring support.

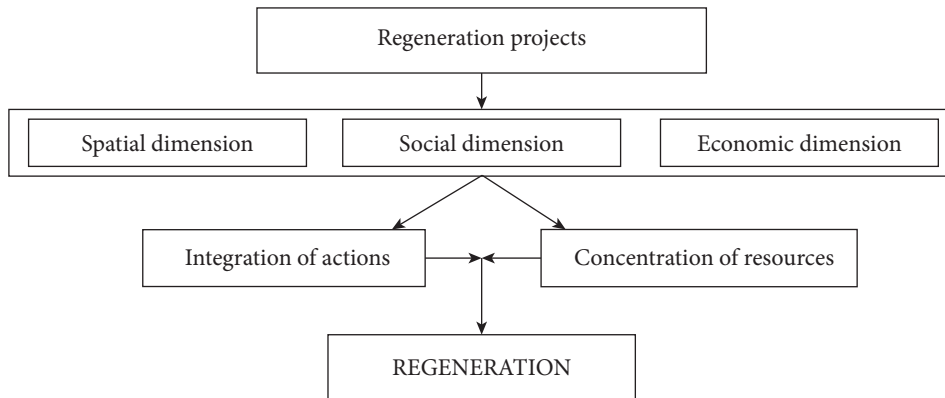


Diagram of regeneration projects

Source: Adapted from: [Podbrez 2013]

This process also includes the responsibility for securing the interests of all the regeneration participants against adverse economic effects. Regeneration projects undertaken without respect for the comprehensive nature of regeneration may lead to unintended results in the form of deeper social segregation and pathology. Therefore, the right of the inhabitants of the revitalized areas to remain in the place of residence and their interests should be guaranteed in advance by the State [Billert 2008]. All possible actions in terms of regeneration should lead to transformations in urban areas in a way that will best take into account the requirements of the constantly changing and evolving society. This comprehensive and simultaneously integrated approach is consistent with the nature of the regeneration process and should be included at every stage of regeneration initiatives.

## 2. The methodology of the research

Assessment of implementation of the JESSICA initiative in terms of efficiency and effectiveness of this instrument in achieving the objectives of the regeneration process of degraded urban space covers many aspects and requires the use of an

the category of financial efficiency by specific benefits, which the investment will bring to society. In regeneration, it is indispensable.



approach based on the positivist paradigm [Czakoń 2014]. In this case, it consists primarily in examining causal relationships existing between the undertaken public intervention actions (projects) and their effects in the form of achieved (previously intended) states (objectives) or stimulation of processes permanently stimulating the achievement of these states. Such recognition of the research process boils down to confrontation of the adopted intervention mechanism and its outcome with the theoretical model of its operation. As a result, it is possible to demonstrate the success or failure of an intervention and, in case of failure, to indicate remedial action. To this end, it is reasonable to use a research approach applicable to process of evaluation of public programs.

The criteria for evaluation of the actions undertaken in terms of the JESSICA initiative are relatively diverse and dependent on many spatial or economic factors, as well as current social needs, frequently diverse, depending on the specific location. Meanwhile, a feature of the evaluation based on continuous research process is that it provides the criteria, methods and techniques, which can be successfully applied to assessment of the rationality of public action (use of public funds), aimed at improving social welfare. Moreover, the conclusions of the evaluation process allow a better understanding of the socio-economic processes and identifying methods of stimulating development, thus enhancing learning processes [Olejniczak 2008, pp. 21–25]. It must also be emphasised that the actions aimed at the regeneration of urban areas are characterized by a strong endemic context, which means that the research task boils down to verification under what conditions, how and with respect to which recipients the intervention is effective or insufficient. In turn, this approach requires the use of elements of realistic approach in evaluation.

An important premise of a realistic approach in this case is that it focuses on a context and processes of intervention. It also treats the subject of study as part of a complex social reality and through the adoption of a relevant analytical model allows the study of individual components and processes shaping that reality [Pawson and Tilley 2005, p. 6]. An essential element of the study is to develop and test a theoretical model of a specific intervention [Chen 2005]. The research procedure involves four stages, which are designed to clarify and understand the actions contained in the intervention program. The starting point is to identify and present the intervention mechanism. This task should be accomplished using the assumptions inherent in a particular type of intervention and the available theoretical knowledge, including identification of the causal link, as well as an initial hypothesis. The second stage is to characterize the context of the intervention. It consists in the fact that the specifications should be made of the characteristics of the conditions in which the intervention is implemented. In other words, this stage should determine “for whom” and “under what circumstances” the intervention will work (be effective). The third step is to identify the intended and unintended effects of the intervention (outcome-patterns) arising from the implementation of various activities in various

areas. The final stage is to create a model combining the three elements mentioned and analyse the relationships between them (context mechanism, outcome pattern, configuration) in the context of verification of the underlying hypothesis of intervention operation [Pawson, Tilley 2005, p. 6; Olejniczak 2008, pp. 32–33].

The study based on a realistic approach has one more advantage, significant from the perspective of the analysed issues. This approach does not impose any specific methods. It is assumed that both qualitative and quantitative methods can be used. However, some authors suggest quantitative and quasi-experimental methods (group selection is not random), which should be selected depending on the scale of the operations being studied, the nature of the relations etc. The role of the researcher who uses objective scientific criteria in this case is to recreate the logic of intervention [Olejniczak 2007, pp. 27–28]. This approach allows one to establish a causal link between the actions and the observed effects – by comparing a specific real situation in which the intervention is implemented with an “artificially generated” counterfactual situation, in which the program would not be implemented.

Keeping in mind the above assumptions, the regeneration process conducted under the JESSICA initiative in Wielkopolskie region was analysed, i.e. the first region in the EU to begin to implement this innovative instrument. To this end, the path of scientific inquiry was chosen, which according to the previously adopted approach consisted of four stages. The synthetic conclusions of the first two stages are presented in the introduction and Chapter 1. The analysis of the remaining steps is included in the remaining part of the article.

The article applied the following qualitative and quasi-experimental methods: literature analysis, an analysis of legislation and documentation determining eligibility for support from the JESSICA, including a comparative analysis with the assumptions determining effective regeneration (including local regeneration programs), the method of participant observation in the implementation process of the JESSICA (participation in conferences on the JESSICA initiative in Wielkopolska), field research, interviews with people (officials, project beneficiaries) involved in the regeneration process and experts. Based on the analyses, the basic problems have been indicated and recommendations have been put forward for the process of transformation of urban areas using repayable financial instruments.

### 3. JESSICA initiative

Financial support for regeneration measures, in addition to public domestic funds, is available in the framework of the EU cohesion policy. Due to insufficient non-repayable funds, JESSICA (Joint European Support for Sustainable Investment in City Areas) initiative has been created for this purpose in the 2007–2013 financial

perspective. JESSICA is an instrument to promote regeneration actions using the repayable financing mechanism. It uses the resources of one of the Structural Funds – the European Regional Development Fund. A limited amount of available financial resources, combined with the relatively large-scale needs makes it an alternative approach to traditional grants, consisting in the use of financial engineering instruments in order to promote more effective and efficient urban regeneration initiatives. The JESSICA initiative is an instrument of financial engineering enabling the use of EU structural funds through revolving instruments (loans, guarantees), allowing for a better use of resources and achieving the multiplier effect of the actions implemented [Memorandum 2006]. JESSICA was developed by the European Commission in cooperation with the European Investment Bank (EIB) – which can act as a trust fund manager and which works in cooperation with the Council of Europe Development Bank (CEB).

JESSICA promotes sustainable urban development in the EU by supporting projects in the following areas: urban infrastructure (including for transport, water and sewage systems or power), heritage or places relevant to the culture (contributing to the development of tourism or other permanent use), development of brownfield sites (including cleaning and decontamination of the areas), creation of new commercial premises for small and medium-sized enterprises, development of information technology and research and development works, expansion of university buildings and improving the energy efficiency [Komisja Europejska 2013a].

It is assumed that this initiative should bring a number of benefits [FE 2011; Komisja Europejska 2013b]:

- generating profits through projects implemented using financial engineering instruments, thus making them more profitable for investors; it is also a more permanent alternative compared to traditional support in the form of grants;
- occurrence of leverage – by combining structural funds with other existing sources of funding; the JESSICA initiative is to contribute to increase in the pool of resources and facilitate support for more projects than in the case of repayable funds;
- the initiative is to provide flexibility in structural terms regarding the usage of funds (in the form of equity, debt or guaranteed investments, which can be adapted to the specific needs of the countries and regions);
- gaining know-how – JESSICA is to allow the structural funds managing authorities and urban authorities to benefit from the aid of the private and banking sector, which ultimately aims to facilitate the acquisition of further investments in the coming years, and provide technical and financial performance in the implementation phase of the project and during its management;
- JESSICA can be a catalyst for establishing partnerships between countries, regions, cities, EIB, CEB, other banks, investors, in order to solve the problems of urban areas;

- the initiative emphasises the so-called social aspect of the projects, estimated on the basis of the advantage of positive externalities of an urban project (the so-called social elements) over the commercial part of an investment;
- projects shall potentially represent greater complexity than under the grant system and be more varied (e.g. shopping malls, business incubators, office space, dormitories, hotels, underground parking, etc.).

This initiative has so far been applied in the majority of EU countries, including Poland, which was the first to call for applications.

#### 4. JESSICA in Wielkopolska

Wielkopolska is the first Polish and EU region<sup>4</sup>, which decided to sign the contract, which allowed the implementation of projects with the use of JESSICA funds. The amount of approx. 66.3 million euros was allocated to Wielkopolska under JESSICA [BGK 2013].

The institutional structure is as follows: the Board of the Wielkopolska Region was the managing authority. The European Investment Bank held the function of the Trust Fund as the sole beneficiary of Measure 4.1. of Wielkopolska Regional Operational Programme 2007–2013. The allocation of the resources from the Urban Development Fund (UDF)<sup>5</sup> was the responsibility of Bank Gospodarstwa Krajowego. The (urban) regeneration projects themselves were implemented in terms of the urban regeneration programs. This scheme corresponds to the general scheme adopted for the management of JESSICA, mainly assuming the functioning of the municipal investment fund. Establishing the institutional structure in Wielkopolska took place according to the following schedule [FE 2011]:

- April 29, 2009 – an agreement was signed on the financing of the JESSICA Trust Fund with the European Investment Bank;
- March 22 – April 8, 2010 – EIB as the Trust Fund manager announced a competition for urban development funds (UDF);
- September 29, 2010 – a contract was signed with the selected entity for the urban development fund, which was Bank Gospodarstwa Krajowego (BGK);
- October 29, 2010 – BGK announced an open call for applications for a loan for urban projects.

<sup>4</sup> In addition, JESSICA was implemented in four other Polish regions. These are: Śląskie (60 million euros), Pomorskie (57 million euros), Mazowieckie (40 million euros) and Zachodniopomorskie (33 million euros) [BGK 2013].

<sup>5</sup> This is an earmarked fund, created by the cities from trust funds involving potentially own resources of local governments, funds of public-private partnerships and EU funds [Gwiazda and Zawadzka 2012].

JESSICA was implemented in Wielkopolska under two priority axes of the Wielkopolska Regional Operational Programme for the years 2007–2013 (WROP), but only one concerned the regeneration and it was: Priority Axis II Regeneration of problem areas, **Measure 4.1 “Urban regeneration”**. This measure concerned broadly interpreted regeneration in deprived urban areas. The projects should have been targeted in particular at the development functions of cities, urban renewal, regeneration of areas with misused potential and support for development initiatives, employing local specificity. These included the projects in the scope of development of housing infrastructure, covering only the renovation of the common parts of multi-family residential buildings, renovation and change of use of existing buildings owned by public authorities or non-profit operators.

The regeneration projects implemented in Wielkopolska faced specific requirements contained in the competition documents. The general scope of support for the projects was defined in the “Guidelines on the development principles for programs for applying for support under the JESSICA initiative and Measure 4.2 of the Wielkopolska Regional Operational Programme for the years 2007–2013.” Pursuant to art. 44 of the Resolution of the Council (EC) No. 1083/2006 and art. 43 of the Resolution of the Commission (EC) No. 1828/2006, JESSICA funds investing in public-private partnerships and other urban projects included in an integrated plan for sustainable urban development.

Implementation of the projects financed under the two WROP measures was to ensure achieving the following objectives:

- “creating stronger incentives for the implementation of urban regeneration through the cooperation of private and public entities and structural funds while ensuring professional management of the funds;
- the use of expert knowledge in terms of finance and management for the implementation of investments in the projects, some of which will be non-profitable as a rule, and the other will demonstrate profitability at various levels;
- providing bridging financing for projects where upfront costs are usually high and the benefits occur in the long term;
- implementation of projects in areas where private operators are reluctant to invest.” [Guidelines ..., 2009, pp. 11–12].

In addition, the criteria to be met by the urban projects have been specified. They mainly concern the need to obtain the rate of return on investment and, therefore, the need to base the project on an element of profitability. This is due to the nature of support, namely a loan. However, in the case of regeneration projects (Measure 4.1.) it is also required to include the social components, focused on:

- improving the quality of life,
- reducing the adverse social factors,
- positive impact on the environment.

In addition, the projects should be aimed at enhancing the local development potential in deprived urban areas, taking into account the need to resolve issues such as [BGK 2013]:

- social exclusion,
- high levels of crime,
- overall deterioration of the quality of life in the project implementation areas<sup>6</sup>.

Any commercial entities could apply for support under the JESSICA initiative, irrespective of their legal form. These include the units of local government, municipal utility companies, private entrepreneurs and public-private partnerships<sup>7</sup>.

## 5. The results

The prerequisite for applying for a JESSICA loan was to jointly meet at least three regeneration requirements (criteria) contained in the documentation, which effectively stopped some entities from applying for funds at the start of the call for applications. Therefore, the stakeholders decided that the support may also be granted to projects that meet only one criterion. This had a significant impact on increasing the number of applications, but the possibility of the desired results of regeneration process potentially decreased (see Table 2).

9 projects in Wielkopolska have been analysed, for which BGK signed an agreement with the beneficiaries for assistance in the form of a JESSICA loan (see Annex)<sup>8</sup>. The data used in the study came mainly from the detailed description of the projects analysed as well as from local regeneration programmes (LRP) of cities where those projects have been implemented<sup>9</sup>. As already mentioned, the study relied on the assumption that the regeneration process requires a comprehensive and integrated approach to the development of degraded urban areas and effective

<sup>6</sup> These problems are part of the catalogue of characteristics of degraded urban areas mentioned in the first part of the article.

<sup>7</sup> The catalogues of potential beneficiaries were defined separately for Measure 1.4 and 4.1 of the Detailed Wielkopolska Regional Operational Programme 2007–2013.

<sup>8</sup> The analysis included only the projects, which met the criteria of the regeneration process carried out under JESSICA before the amendment of guidelines which introduced the new rules for designating the dysfunctional areas [Guidelines 2012]. According to the authors, this change in practice leads to the situation in which only one criterion for regeneration can be used in delimiting a dysfunctional area, which means that projects might be implemented in these areas which will not necessarily satisfy the assumptions of the regeneration process.

<sup>9</sup> The study included the analysis of LRPs of the following cities Gniezno [LRP Gniezno 2013] Jarocin [LRP Jarocin 2012], Koźmin Wielkopolski [LRP Koźmin Wlkp. 2010], Leszno [LRP Leszno 2010], Ostrów Wielkopolski [LRP Ostrów Wlkp. 2011], Poznań [LRP Poznań 2006], Szamotuły [LRP Szamotuły 2011].

coordination between the various entities and institutions involved in urban policy. Therefore, the main attention focused on the features determining the three dimensions of regeneration, i.e. economic, social and spatial dimensions. This approach aimed to answer the following questions: whether the analyzed projects actually take into account these three dimensions or, in other words, whether they contribute to the objectives of the regeneration process. Finding answers to these questions made it necessary to pose three additional detailed questions, each of which was associated with a specific dimension of regeneration:

- A question regarding the economic dimension – is the project financially efficient and will it contribute to the restoration of economic activities, including in particular a positive impact on creation of new jobs?
- A question regarding the social dimension – does the project contribute to the prevention of social exclusion and social pathologies and guarantees participation in social and economic life?
- A question regarding the spatial dimension – does the scope of the project account for a specific nature of the area, thus responding to the problems and needs diagnosed in the local regeneration programs?

Preliminary results obtained in accordance with the adopted path of research set out in Chapter 2 have been supplemented by information obtained during the 5 structured interviews conducted with independent experts specializing in the regeneration and development of urban areas. The results of the analysis are presented in Table 2.

Table 2. Projects implemented under JESSICA in the WROP for 2007–2013 and the dimensions of the regeneration process

No.	Project description	Economic dimension*	Social dimension*	Spatial dimension*
1	Brownfield redevelopment in the city centre by building „Galeria Goplana”	+	–	+
2	Construction of a multifunctional segment of an office and service facility in the area of the Poznań Technology and Industrial Park	+	–	–
3	Regeneration of degraded area in the city and the construction of Office Centre Podwale	+	–	–
4	Regeneration, expansion and adaptation of the old gas works building for educational and cultural purposes	+	+	–
5	Regeneration of the former barracks building and its adaptation for purposes related to education and culture	+	–	–
6	Regeneration of the pumping station building and its adaptation for the cultural purposes	+	–	–
7	Reconstruction and expansion of Maraton hotel with the reconstruction of the sports hall	+	–	–

8	Construction of a multimedia communications centre for a publishing house, editorial offices, the board offices and volunteer training centre	+	+	-
9	Modernization of a town market in Gniezno	+	-	+
	<b>Effect</b>	<b>obtained</b>	<b>uncertain</b>	<b>uncertain</b>

\* “+” – means that the project meets the assumptions of the dimension of the regeneration process; “-” means that the project does not meet the assumptions of the dimension of the regeneration process; “effect” – indicates the fulfilment / non-fulfilment of the assumptions of the regeneration process of projects under the JESSICA initiative.

The principal task of regeneration construed as an integrated process of actions in spatial, social and economic spheres is to improve the living conditions of communities living in degraded urban areas. This also includes the protection of participants in the regeneration process against possible adverse economic consequences. The results obtained in the course of the analysis indicate that the projects under the JESSICA initiative are likely to achieve the desired economic results. These projects are characterized by good financial performance, which is a measure of the profitability of the project from the point of view of the investor. Thus, the project is cost-effective when the value of net financial benefits exceeds the expenses incurred by the investor. This means that these projects are profitable because they are able to generate profits, which in turn is a prerequisite for applying for JESSICA support<sup>10</sup>.

A decision on the JESSICA loan is made by BGK, which takes into account in particular the results of the financial forecast carried out in the feasibility study. This process basically ignores the main decision-maker in terms of urban policy – the city authorities, whose role is limited to confirmation whether the project is located in the dysfunctional area specified in the local regeneration program. As a result, the main decision-maker becomes an Urban Development Fund (in this case the bank), whose operation objectives may differ from the objectives of the city authorities<sup>11</sup>. Therefore, the desired results due to the social and spatial regeneration dimensions remain far from expected. In the analysed projects, primarily an investment element is clearly visible. Despite the fact that all the projects are in crisis areas, they appear to not have been fully adapted to the needs of specific areas. Moreover, the actions of a social nature are incidental and do not respond to the real needs of residents. So far, a rather low impact of the projects has been noted with regard to improvement of the situation in the cities (there is a separation of projects from negative factors diagnosed in deprived urban areas), but one

<sup>10</sup> It does not apply to projects for which financing in the form of a loan does not constitute state aid – these projects are devoid of a business element.

<sup>11</sup> Interview with representatives of the consulting companies (experts in the field of regeneration) conducted on 25.06.2013; 15.10.2013; 08.05.2014.



must be aware that obtaining the majority of the effects requires proper time, and therefore they can still take place.

The material scopes of the projects are primarily limited to commercial ventures, which is understandable due to the requirements of the JESSICA instrument. On the other hand, this restriction means that these projects do not fully address the specifics of the regeneration process as such. This means the prevalence of projects, which do not fully meet the objectives of urban regeneration. Analysis of the surveyed undertakings allows for a conclusion that the impact of the projects in terms of local regeneration programs is relatively small (see Table 2). There is a risk that these projects may not contribute to the achievement of the objectives of local regeneration programs. Referring to these results, one can therefore argue that an integrated approach has been applied to JESSICA projects implementation system. The diagnosed weaknesses may result from the fact that there is little experience with the use of this type of repayable instruments [Dąbrowski 2014; Michie and Wishlade 2012].

Moreover, the following conclusions concerning the beneficiaries and the regeneration projects themselves have been diagnosed.

The first group of observations relates to the **beneficiaries**:

1. It can be seen that relatively high interest of investors (public and private) appeared with the launch of this instrument, but at first, few applications for JESSICA loans were submitted due to<sup>12</sup>:
  - lack of possibility of securing the loan repayment,
  - non-profit nature of many regeneration projects, especially those implemented by municipalities (public goods),
  - lack of financial resources to provide own contribution,
  - specifics of regeneration, requiring, among others, repair, modernization, maintenance etc.

Available allocation has been exceeded [BGK 2013] only after the change in the guidelines (see footnote 12), which enabled the appointment of dysfunctional areas covering much larger areas of cities. On the one hand, this step has led to increased interest in the JESSICA loan among project authors, on the other hand it has weakened the importance of this repayable instrument in achieving the goals of regeneration, as it led to the support being granted to the projects, the implementation of which occurred outside the areas of simultaneously most intense adverse socio-economic and spatial phenomena.

2. The cooperation of private investors with the city authorities in terms of regeneration investments is insufficient. Municipal authorities have essentially no influence on which project will receive support under the JESSICA initiative from the Urban Development Fund<sup>13</sup>.

<sup>12</sup> Speech at the conference and an interview with the beneficiary on 25.07.2012 and 25.06.2013, and also with an official of the city office on 19.06.2013.

<sup>13</sup> Interview with the officials of the city council on 19.06.2013.

3. There are no projects implemented in the form of public-private partnership (PPP)<sup>14</sup>.
4. The projects are underestimated in terms of results of regeneration by the private operators and, moreover, these entities have high expectations regarding preferential lending<sup>15</sup>.

Meanwhile, conclusions regarding regeneration projects are as follows<sup>16</sup>:

1. The scope of projects varies: shopping malls, incubators, office space, hotels, underground parking, city fairs, sports halls etc.
2. Dispersal of projects limits the synergy effect.
3. The value and size of the projects varies.
4. There is a prevalence of projects, which do not fully meet the objectives of regeneration – the scope of the projects limited to profitable undertakings, failing to comprehensively recognize the regeneration objectives.
5. Lack of an integrated approach to regeneration.

In conclusion, the regeneration measures carried out using repayable instruments (JESSICA) are often limited to infrastructure investments, which cause the transformation of facilities or areas. They do not include the social and spatial context, which means that they have little in common with integrated socio-economic actions.

## Conclusions

The analysed examples provide the first conclusions on the use of JESSICA in Wielkopolska. First, it may be noted that: JESSICA is a financially effective and efficient instrument of urban regeneration, however, its economic efficiency is hardly satisfactory. Moreover, the projects implemented lead to the improvement of urban infrastructure, but fail to solve the social and spatial problems. Thus, the approach applied so far does not reflect the socio-economic dimension of the regeneration process, and the benefits assumed by the initiators of JESSICA at the EU level are being achieved only partially.

Further efforts are needed to improve the use of this financial engineering instrument. It seems that the projects co-financed by JESSICA should be implemented in parallel with the so-called “soft” projects, and the call for soft and hard projects should take place at the same time, as is now proposed in terms of the so-called

<sup>14</sup> Based on the analysis of project documentation.

<sup>15</sup> Based on project documentation and an interview with the project author on 09.07.2013.

<sup>16</sup> Based on field research, analysis of project documentation and analysis of social and economic indicators and maps of neighbourhoods in which the analysed projects are implemented.

integrated territorial investments as part of the development strategy until 2020<sup>17</sup>. It appears necessary to also adapt or create a new legislation to protect the interests of participants in the regeneration process (as e.g. in Germany, cf. [Billert 2008]).

The interviews conducted by the authors show that cities have little or even no influence on shaping the program assumptions of JESSICA, and the main stakeholders are the EIB and BGK, which decide on the criteria for granting support under the initiative. Consequently, for example, areas significant from the perspective of regeneration (e.g. housing problems and derivatives thereof) are unsupported.

The following shall be put forward as recommendations for coming years and for the next programming period:

- the need for a more integrated approach,
- concentration of actions more than ever before,
- the need to protect the residents of revitalized areas against the adverse socio-economic impact,
- complementarity in the implementation of infrastructure projects and soft projects,
- developing a method of reaching a compromise (return on investment and non-profit public goods).

Summing up, regeneration undertakings by their very nature need to take into consideration the spatial, social and economic dimensions of urban areas. They also should consider the need to shelter the inhabitants from the potential negative externalities of such initiatives. JESSICA can be an effective and efficient tool for urban regeneration but still requires special attention in particular as far as the spatial and social dimensions of regeneration are concerned.

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<sup>17</sup> So far, despite implementing the soft projects co-financed by both operational programs, for example “Human capital” (HC OP), and actions co-financed by the municipalities, rarely have deadlines for their implementation been synchronized with the dates and scopes of the hard investments (based on analysis of the HC OP projects implemented in Wielkopolska and interviews with officials of Poznań Municipal Office, 19.06 2013).

## Annex. Projects implemented under JESSICA in WROP 2007 – 2013 (as of 21.06.2013)

Project type	City	Loan from JESSICA PLN/EUR million	Beneficiary	Project description
Brownfield redevelopment in the city centre by building „Galeria Goplana”	Leszno	50/12.5	Private entity	The project involved the construction of a shopping mall in the city centre, on the grounds of the former plants Goplana and Metalplast, with a leasable area of 28 thousand m <sup>2</sup> , which will include 120 trade and service establishments and restaurants and a cinema, a fitness club and bowling alley. Furthermore, the facility was to include 760 parking places. Investor assumed that it would make available to the city the area in a tenement house adjacent to the mall, where a modern multimedia library was to be located. The investment would provide approx. 700 additional jobs. The project was not implemented
Construction of a multifunctional segment of an office and service facility in the area of the Poznań Technology and Industrial Park	Poznań	18.5/4.6	Municipal company	The project created a modular multi-purpose office and service facility consisting of three segments with a total usable area of approx. 17 thousand m <sup>2</sup> with multimedia and office equipment. An appropriate arrangement of rooms was designed in order to ensure that companies have favourable conditions for starting and running a business. An important objective of the project was to provide services to companies located there in terms of overall tax and legal advisory, which is free of charge
Regeneration of degraded area in the city and the construction of Office Centre Podwale	Poznań	22.5/5.6	Private entity	The project created a modern office centre consisting of two buildings with a total area of 12 thousand m <sup>2</sup> . In addition, more than 300 parking spaces were provided in the underground and ground parking for tenants of the office complex. The investment also included the establishment of a publicly accessible park with walkways, benches and a playground for children. The nearest neighbourhood was covered by video surveillance
Regeneration, expansion and adaptation of the old gas works building for educational and cultural purposes	Koźmin Wielkopolski	1.0/0.25	City	The project consisted in adapting the old gas works building for cultural and educational purposes. The modern multifunctional culture centre included modelling studios, recording studio, conference and event room, ballet hall and stage for small theatrical forms. The aim of creating a modern and attractive cultural centre was to meet the needs in terms of organization of cultural events in the town and municipality. The facility also hosts various campaigns and workshops aimed at activating children and young people from communities at risk of social exclusion. It was the first European investment made with the participation of the JESSICA initiative

Project type	City	Loan from JESSICA PLN/EUR million	Beneficiary	Project description
Regeneration of the former barracks building and its adaptation for purposes related to education and culture	Ostrów Wielkopolski	3.6/0.9	Private entity	The project consisted in carrying out comprehensive modernization and adaptation in the former military casino building in Ostrów Wielkopolski. The renovated building provides hospitality services and organizes events. In addition, the investor provides a conference and training room for the needs of non-governmental organizations free of charge
Regeneration of the pumping station building and its adaptation for the cultural purposes	Ostrów Wielkopolski	6.0/1.5	Private entity	The project involved the reconstruction and extension of the former sewage pumping station in Ostrów Wielkopolski. Comprehensive adaptation work was carried out in order to adapt the building to organization of cultural events. The following were established as a result of the investment: a restaurant, music club, bar, hotel, fitness room/gym and museum space. Training rooms and museum space are available free of charge to NGOs
Reconstruction and expansion of Maraton hotel with the reconstruction of the sports hall	Szamotuly	6.5/1.6	Municipal company	The project involved the reconstruction and expansion of the hotel in Szamotuly with a partial reconstruction of the existing sports hall "Waclaw" for hotel purposes. The scope of the project involved connecting these two facilities. The hotel itself was completely redesigned and adapted to current standards. The current foyer of sports hall houses the hotel's reception and restaurant. The investment created a professional conference room. In addition, the building was subjected to thermal efficiency improvement and adapted to the needs of the disabled. The neighbourhood of the building also underwent development
Construction of a multimedia communications centre for a publishing house, editorial offices, the board offices and volunteer training centre	Jarocin	1.5/0.36	Private entity	The project modernized the existing building, which previously served as an office building and the workshop space. The facility houses, among others, a modern information sites management centre belonging to Południowa Oficyna Wydawnicza and the new headquarters of "Gazeta Jarocińska." In addition, "Laboratory of new media technologies" has been created, aiming to prepare an interactive local weekly and monthly "Więści Rolnicze". In the building next to the headquarters of the company there are also rooms dedicated to the activity of the Foundation „Ogród Marzeń” and volunteer training centre
Modernization of a town market in Gniezno	Gniezno	5.6/1.35	City	The project included comprehensive modernization of the municipal market in Gniezno with the area of 3.5 thousand m <sup>2</sup> . Modern, roofed merchant pavilions have been constructed (109 closed stalls, with the connection option, 16 flower kiosks, and 38 tables) and 122 roofed parking spaces. Modern infrastructure has been established, necessary for the proper operation of the facility (sanitary facilities and utility rooms). The investment also included ordering the space around the facility, i.e. providing the squares with benches and internal roads

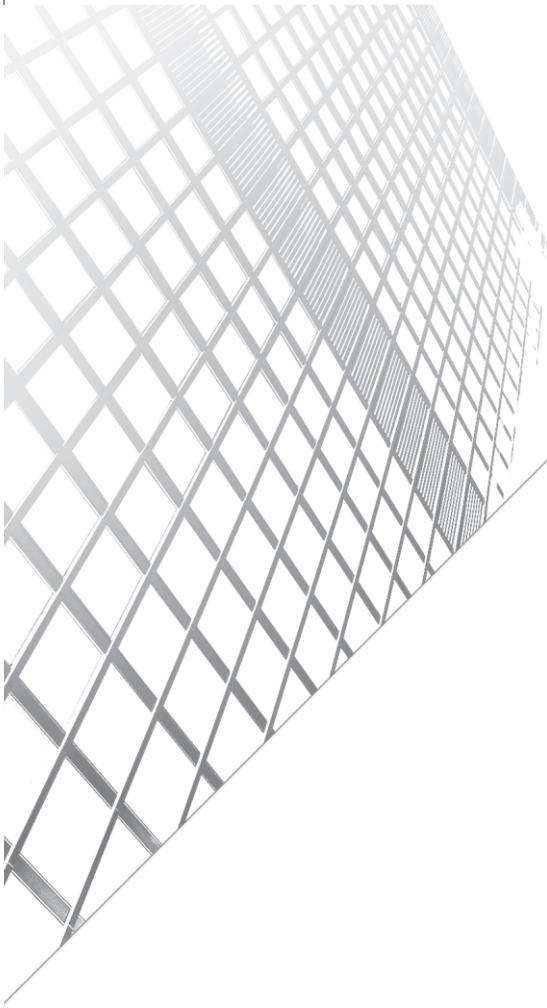
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# Doing Business under Global Challenges



# Behavioural economics and the effectiveness of leadership in international business

## Introduction

The globalization of the economy, growing international competition as well as many other factors affect the growth of demand for leaders who will effectively manage the business. Innovation, which builds competitive advantage, stems from the implementation of an increasing number of projects, which are also guided by leaders. Mobility of workers and enterprises means that leaders should devote more and more attention to coordinating the work of multicultural teams. On the other hand, the development of behavioural economics means that it is appropriate to refer the principles of leader's actions to emotional conditions. These factors constitute a justification for taking up a discussion on the relationship between the findings in the area of behavioural economics and effective leadership in international business. Considerations are theoretical and literature-based. To accomplish this objective, the knowledge will be used in the field of behavioural economics and leadership. The research methodology refers to the principles of logical reasoning, critical analysis of published results of research, observation and experience of working with leaders working in enterprises and directing projects. Linking research results from the field of behavioural economics with the effectiveness of leadership is treated as a new value in this article.

## 1. Behavioural economics – implications for leadership

The classic paradigm of economics as a science was based for many years on the assumption that people are economic, rational beings. Saying by Descartes “cogito ergo sum” – I think therefore I am – formed the foundation on which the theories

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and models were built of behaviour of market participants (consumers, entrepreneurs). Started in the seventies, research by D. Kahneman and A. Tverski showed a smaller than anticipated impact of rationality on economic decisions [Kahneman 2012]. The Nobel Prize in Economics, awarded in 2002 to the said researchers stressed the importance of the emotional impact on the behaviour of sellers and buyers. Research by A. Damasio suggests the dominance of the emotional over the rational in making market decisions [Damasio 1999]. The application, on an unprecedented scale in economic science of an experiment as a test method has shown the importance of the emotional sphere in decision-making [Ariely 2009]. Identification of the two systems of thinking – namely, quick and slow has shown how many pitfalls there may be in the process of decision-making [Kahneman 2012]. The impact of emotions on decision-making processes is higher for consumers than businesses [Collins 2013]. Although the structure of enterprises can reduce the impact of emotions on decisions, it is not possible to eliminate them completely [Motyl 2015].

The discussed area of research is at an early stage of development. Hence, one needs to be cautious about the less than precisely defined scope of behavioural economics [Fox 2015]. In addition to this concept works, there is the term neuroscience, which includes considerations arising from the investigations of the functioning of the human brains. Within this area of research, using new research methods (EEG, fMRI), worthy of consideration is a metaphor for “default equipment”, included in the concept of M. Gazzaniga [Gazzaniga 2013]. The results indicate the dominant role of human genetic structure in the context of their leadership behaviour. These previously briefly mentioned components should be referred to the actions of leaders, in terms of increasing the efficiency of their tasks. The state of knowledge in this scope allows for a critical look at the so far existing concepts of leadership in business.

## 2. The role of leader in business

Observation of birds flying in the V formation may be a metaphorical point of reference for the functioning of the leaders in multinational companies. The enterprises, like flying birds, need a leader who gives direction, creates an atmosphere of rising, motivates colleagues and properly communicates with them [Kabat-Zinn 2014]. Business structures are becoming flatter, and this increases the demand for leaders who will be well prepared to perform tasks [Drucker 2000]. Meanwhile, the existing systems of business students education in Poland to a limited extent offer opportunities for improvement in the performance of the leader functions. In music schools, for example, conductors are trained. In the military, there are

academies educating commanders. Perhaps also in the sphere of business it would be appropriate to offer studies in the area of leadership. One cannot assume that leadership skills will develop spontaneously, along with the promotion of employees to managerial positions. It is an open question, worthy of consideration.

Realizing the complexity of tasks related to leadership, in further discussion, we will refer to several issues, combining them with the knowledge of behavioural economics. These will be the following issues:

- the importance of leader in the process of providing the direction of enterprise development,
- critical evaluation of decision-making processes,
- ways to motivate employees,
- principles and tools of leader communication with the environment,
- organizing teamwork,
- talent management and succession planning,
- management of personal development by the leader.

The presented order is not an ordering by priority. This could be the subject of a separate discussion. It merely points out the importance of harmony for the function of leadership in international business. The point is that regardless of the characteristics of a leader, each of them should work to become an increasingly perfect leader [Benis 2008]. Just as people's faces that are similar and yet each is different in detail, so too each leader will be a unique leader. Regardless of the differences, there will be many common areas, on which individual leaders should work.

### 3. Determining the direction of development (strategic dimension of leadership)

The competitive position and development of the company are strongly correlated with a developed and implemented strategy. Determination of the strategic development is one of the most important tasks of leadership. This is not easy, because people's minds are mainly focused on current operations. Thinking long-term, abstract is very difficult [Clausevitz 2007]. All the more, therefore, leaders should cultivate the ability to think strategically. Besides providing direction, the task of the leader is to build a system of values, which is essential in ensuring long-term development of the company. An example that can illustrate this aspect of the work and responsibility of a leader is an international company Skanska [www.skanska.pl]. It operates in the global market based on a system of five zero:

- Zero losses,
- Zero defects,
- Zero accidents,

- Zero ethical breaches (law),
- Zero violations of the environment.

It may be considered appropriate for the leader of each company to assume responsibility for the construction and implementation of a system of values which will be the basis for the operation and development in the long term. In general, it is worth engaging in activities that will serve creation of a better world [Thaler and Sunstein 2012]. It also becomes possible thanks to the fact that the findings resulting from research can be used to offer solutions beneficial to society. It can also be successfully used by leaders in international business. It also involves companies engaging in operations defined as Corporate Social Responsibility [Kotler and Kotler 2013]. From the perspective of the purpose of these considerations, it is worth pointing to seeking development on an international scale. Strengthening of this communication may be a case of the company KERING [Pinault 2015]. The change of leadership (the case of a successful succession) resulted in the introduction of the company to the global market. In the next few years, the company, which had a 97% market share in France, received over 90% global market share. Thus, the sales proportions were reversed, benefiting not only brands offered but also consumers in many countries. It is also the example of carefully planned and consistently implemented power succession strategy in the company.

The leader's responsibility for the development and implementation of the development strategy is contained in the saying that "in the heart of the strategy should be a heart that knows what to do with the strategy." This imposes an obligation on the leader to focus their efforts on the creation and implementation of strategies by all company employees. The efficacy of action in this area depends on many different factors [Rumelt 2013]. The most important include:

- performing a thorough, in-depth diagnosis of the company based on the method of analysis of the environment, resources and competition,
- determination of the action and two or three goals, which the company will focus on,
- development of a consistent way of achieving the set goals,
- focusing resources and energy on the goals.

Building and implementing the right strategy is not easy, because there are many pitfalls that can deviate the procedure. Here are the most important of them:

- reconciling different interests instead of focusing on that which is essential,
- multiplication of goals,
- dissipation of resources,
- use of slogans, meticulous and voluminous documents,
- avoiding hard work,
- myopia,
- basing only on leader's own opinion.

The cited synthetic reflections point to the responsibility of leadership associated with the process of creating and implementing strategies. In this procedure, it is worth considering the use of methods of learning from mistakes [Cialdini 2016]. The development of the aerospace industry has its origin among others, in a careful analysis of the causes of each plane crash. The above-cited author gives the example of an advisor who uses a method of learning from mistakes in business. He derives it from the assumption that there is a big, difficult to identify list of factors in the success of the company. On the other hand, one usually can determine one cause of failure, bankruptcy or crisis of the company. Knowledge about the causes of failure reduces the risk of creating the wrong strategy. This may be a new, rarely used approach to risk mitigation in decision-making processes.

#### 4. Critical assessment of decision-making processes

Determining the value system of the company makes it easy to make the right decisions, although does not completely eliminate the various traps. In keeping with the established rules, however, one can increase confidence in deciding. An example would be a rule of S. Jobs for everything Apple brand offers to be simple and beautiful. Then, the concentration of resources on the right projects may be higher. An important limitation on the effectiveness of deciding can be emotions as well as the limitations of the human mind. It is therefore important that the leader applies methods of rationalizing decisions [Goodwin and Wright 2011]. Therefore, making decisions based on methods accepted by the leader should be considered appropriate, primarily on rational grounds. Existing ways of rationalizing decisions should be linked to leader's personality traits and existing problems to solve. On the other hand, one must be aware of the various pitfalls and hazards that can weaken decisions rationalizing processes. A large part of them is associated with the area of emotions and barriers existing in the minds. Restrictions may already occur during the preparation of diagnosis. Misdiagnosis leads to the creation of erroneous strategies. To minimize the risk of irrational decision, it is good to use different, independent reports evaluating the situation of the company. The role of a leader is to set two or three teams to gather information. This will allow a look at the situation of the company from different points of view. Apart from this, the leader must develop the ability to challenge their own mistakes. This is not easy, because people are attached to their views. They also have the ease of taking first, imposing solutions. With regard to companies entering the host markets, a hindrance or restriction may be experience gained on its home market. It is also important that the leader frees themselves from the anchor trap, or having a subconscious decision. If they do not analyse the reports with independent mind,

they will only perceive the information confirming a decision proposal existing in the leader's head.

Other risks are associated with the “calm water” trap. It involves the belief that the company does not have any threats, that it has a strong and stable position. A similar threat is the belief that the leader and their team have above-average competence, that they are better than competitors. The threat is also a belief that the assigned tasks are completed more quickly (it's a planning trap) than it results from the experience of others.

In order to reduce the impact of these and other risks, the leader should listen to colleagues, and express their opinions at the end. It may be useful to appoint a person who will contest the proposed solutions, pointing out their weaknesses. This may make decision-makers reconsider the matter.

D. Kahneman suggested a tool called “pre-mortem”, which is used to reduce the risk of wrong decisions. It consists in the fact that before the implementation of the solution a team is appointed that receives the information that a year has passed and that the project did not achieve success. The team's task is to look for reasons for this. This method allows to make additional improvements before the project is implemented to avoid eventual defeat.

## 5. Motivating employees

Achievement of the objectives set in the strategy is associated with the involvement of the leader and employees. Here, we are taking a critical look at ways to motivate employees in relation to the discussed changes in the sphere of economics as a science. One issue is the discovery relating to the functioning of human brains. The second area is the changes that occur in successive generations of employees. At the beginning of the twenty-first century, the average company has people from three generations working together that differ quite significantly in terms of system of values, expectations and qualifications. Conventionally these are BB (60 years and more), X (36–59 years) and Y (19–35) generations. While the BB generation focuses on motivating through financial instruments, workers from Gen Y expect other activities. For this group, it is important to provide support in terms of qualification, passes to various clubs, additional health insurance. They expect transparency, good atmosphere, frequent communication. Therefore, to effectively act as a leader, one must adapt to the value system of another generation of employees, while hiring at construction sites in Poland of employees from Ukraine will be associated primarily with the use of financial incentives. These will be essential in order to guarantee families a slightly higher standard of living. In this regard, the international aspect affects the systems and tools used to motivate.



Research conducted at the turn of the century indicate that it is worth using a new approach to motivating employees. It turns out that the rewards unexpected and tailored to the needs motivate more [Weinschenk 2013]. Employees like to be involved in setting goals – then they are more likely to achieve them. They respond well to changing stimuli. Thus, it is appropriate to search for new ways to motivate. Effective motivation is using small sections – e.g. the execution of the plan still needs 8% of sales [Cialdini, Steve and Goldstein 2016]. Also important are the direct thanks from the leader, appreciation of the effort and involvement of employees [Brzeziński 2013]. In the era of high competition among enterprises, importance of teamwork is growing. In view of these changes, one needs to use both motivation for individual employees as well as for those who build teams and engage in raising the qualifications of the members of the team.

## 6. Principles and tools of leader's communication with the environment

In the leader's job it is important to develop strategies, to motivate people and communicate effectively with employees and stakeholders in external environment. First, one needs to emphasize the importance of first impressions as part of building a relationship with the team. The leader should carefully prepare for the first meeting with the team. It has a crucial importance for building relationships in the long run. Discussed earlier, the instruments to motivate tend to have a short duration. In contrast, effects resulting from positive first impression may persist for years. This justifies careful preparation of the leader for the first meeting with the team [O zarządzaniu 2012]. Employees appreciate the personal contact with the leader. They should therefore find time for direct meetings with employees, communicating to them that they are interested in the employees and their work. For employees contact with the leader is particularly important during the economic crisis. Then the presence and support of the leader strengthen their sense of security.

The leader is always observed by the team, no matter where they are. Employees receive and evaluate primarily non-verbal communication. When there is a conflict between verbal and nonverbal messages, people believe what they see, which is the body language. This means that the leader should have the inner conviction to communicate with employees taking care of the harmony between the verbal message and body language. In building the right atmosphere in the team the frequency is important to. Thus, one should schedule meetings with employees. Another issue is the leader's communication with entities in external environment. In this case, one must appear in person at various events. The presence of the leader in this case is important from the point of view of relations with the authorities, customers or

competitors. Besides, it is necessary to maintain contacts with the traditional media (interviews in the press and television). Presence of the leader in social media is becoming increasingly important. The youngest stakeholders expect to have all the information appearing in the relevant social media. Leaders, therefore, should be aware that their presence, anywhere, can be recorded and commented on social media. This means that the leader needs the support of colleagues, for the current communication with the environment. This is all the more necessary because one cannot get away from what is the most important for any company, which is to build and implement long-term development strategy.

## 7. Organizing teamwork

As part of the tasks of a leader, there are both responsibilities to coordinate the work of the Board as well as supervise the work of many teams. An increasing role in building the company's market position falls to the teams. It is true that there are specialists who work independently, but the importance of teamwork is growing. An additional difficulty is increasing diversity of teams. Besides discussed issues of generations, one needs to identify the cultural or religious differences. Companies that enter new markets encounter many barriers associated with existing customs and rules. A multicultural team leader should respect the cultures and religions of all employees. This may be all the more difficult, the more intense are the processes of migration, especially due to political conflicts. Expansion into foreign markets, which is an important direction of development of the company, puts the leaders before the necessity to find themselves in a new cultural environment. Committing mistakes in the beginning, may result in the inability to build relationships with the team. Hence, it is necessary to carefully prepare for work in the new cultural environment.

Another extremely important issue is to build a team, in which the leader works. It is a long-term program, which requires knowledge and self-improvement. An integrated team can build a sustainable advantage for the enterprise in the market [Łazarewicz 2013]. To create an efficient and dedicated team takes time and appropriate procedures. It is essential that the atmosphere in the team is good, and trust is its foundation. The condition for building confidence in the team is to respect each other, to talk, exchange ideas, share information about [Sprenger 2009]. The effect of trust is the ability to express ideas, to present own position, to be open to arguments. Such behaviour is quite rare in the culture of Polish enterprises. This limits opportunities for teamwork improvement on the principle of open and critical discussions between employees. Such behaviour can be a barrier to guarding the standards and keeping a high level of product quality [Lencioni 2013]. Supporting

workers who identify themselves with the team leads to increased involvement in the performance of their duties. It also allows for the identification with tasks and taking responsibility for tasks. In search of the community, a good tool can be listening to every employee, and then making a decision by the leader. Discussions may be had at the stage of goal reconciliation. The adoption of a strategy for the implementation begins the phase of full commitment and responsibility of the whole team for getting the established result. It is of crucial importance in assessing the effectiveness of the teams.

## 8. Talent management and succession planning

In building a long-term market advantage it is good to rely on workers, who will have higher qualifications than the competition. Prominent, effective leaders have the ability to attract talented employees. Apart from this, leaders should support the talent management programs in enterprises. Analysis of stock market information allows to see significant correlation between high scores and having talent management program [Martin 2015]. This is a relatively new area of leader responsibility. This can be done in many ways. There are leaders who under their direct care have a few people who are prepared to act as leaders [Avery 2009]. There are also companies that implement talent management programs. On their own or in cooperation with other entities, they assess the potential of employees and then determine, in accordance with their talents, the paths of personal development. An important task of a leader is therefore their patronage over the talent management program.

The discussed issue is linked with the issue of succession. It is also different in the various entities. It would be good if each leader had in mind who their successor will be. It will not always be their decision, but it is worth preparing candidates for the place. This problem may be of particular importance in family businesses. It is also worth touching upon from the point of view of the situation in Poland. After the system transformation, that is, after 1989, many family businesses were founded in Poland. Around 2015, more than 25 years passed and this means that in many family businesses a matter of succession becomes current. Changes taking place in the world indicate that the percentage of children who are ready to take over family businesses after their parents is decreasing. This means that ensuring the sustainability of such an undertaking on the market requires the development and implementation of the relevant programs of succession. In this case, it may be appropriate to use developed, based on the research, methods of preparing leaders in the framework of succession [Fernandez-Aroaz, Igbal and Ritter 2015]. It is important, since poorly prepared succession could undermine the position of the family business on the stock exchange or market.

## 9. Management of personal development by a leader

In the final part of the discussion we shall refer to perhaps the most important issue which is the development of personal leadership. The effectiveness of leadership is rooted in the Latin proverb “*verba docent, exempla trahunt*” – “words teach, examples involve.” To put it somewhat differently, it may be said that the quality of the team’s work begins with the leader. The leader can effectively make demands of the team, if they first make demands of themselves. The leader who improves their qualifications, may require the same from colleagues. It is known that there are no perfect people. There are also no such leaders. On the other hand, no one will be an effective leader when they fail to pursue personal development. According to the Eisenhower matrix, a leader should focus on important and not very urgent issues [Seiwert 1998]. The condition for such action is the ability of delegation and surrounding ourselves with competent deputies. In talks with the leaders who were successful in the market, information about planning each day and using time resources for appropriate action is abundant. Consistency of the leader means that they should take care of both professional issues and family life, social relationships and their physical, mental and spiritual condition [Covey 1996]. In the personal development, the leader must strive to obtain a balance between all areas of activity. Proper planning time can be critical. Daily energy may have its origin in the morning meditation, physical exercise and a good breakfast. Morning hours are generally associated with a high yield of the brain [Keller 2013]. It is advisable to use them for analysis and the work of a strategic nature. Midday hours associated with lunch, can be used for meetings, discussions, agreements. In the afternoon, it is time of greater efficiency, which can be combined with work on the projects. Next, one needs to remember about building family and social relationships. The evening calming down of the body allows the body to prepare for sleep and night rest. The higher the ability of the leader to focus on one issue, the less time loss resulting from switching from one task to another.

## Conclusions

Effective business management in international business requires committed and responsible leaders. They are responsible for setting the direction of development, and motivating employees to achieve their goals. They should accordingly adapt the principles and tools of motivation to team members consisting increasingly of employees from different cultures. In building the company’s position, regardless of the prevailing conditions in the country, honesty, adherence to ethical standards,

can be considered as a basic condition for the development and continuation in the market. The leader gives the team a sense of confidence. For that to happen, they themselves should take care of raising their competence. Every leader should therefore develop and apply individual plan to accumulate their energy, which they will relay to the team. Leaders are always observed by employees. They are the crew's resource for personal inspiration and a sense of security. The results of research conducted in the field called behavioural economics are extremely useful for the development of skills by leaders. They allow to better understand the determinants of human behaviour and adjust management methods in order to jointly create a better world. This is the more complex, the more companies operate globally. Being aware of cultural factors may reduce the risk of operating in the host markets. Working in multicultural teams can further absorb the leader's qualities and resources to create the principles of cooperation based on mutual respect and trust.

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## Clusters in the process of internationalization

### Introduction

Clustering processes essentially take place on a local or regional scale, but their global prevalence transforms the landscape of economic activity on an international scale. In the era of globalization research on business clusters can be grounded in the theory of international business and the theories looking at the issues of location and geographical distance. The issues concerning the location of economic activity in relation to internationalization processes – with globalization being their special case – are addressed within the framework of the concepts discussing the behaviour of multinational corporations. They are particularly pronounced in the paradigm of Dunning [1998] as well as Rugman matrix [2010], which presents the decisions regarding the expansion of multinational corporations. The relationship between the location and geographical distance, which are inextricably linked with clustering, has stood at the forefront of Porter's diamond model [1990a, 1990b]. Porter indicated the key drivers of competitive advantage of specific national sectors on an international scale, recognizing the network of related and supporting industries along with geographic concentration as one of the determinants. According to some researchers clusters are a response to strong competitive pressures that enterprises and national economies are put under in the era of globalization.

The importance of this issue is highlighted by examples taken from business practice. And so, the heart of the world-renowned Silicon Valley are companies focusing their activities on microelectronics and computers. The cluster spans an area of about 300 square miles between Palo Alto and San Jose in California with approximately 6,000 companies in operation. New relationships and new contacts are established due to the high mobility of workers between companies, which drives the development of social network in the cluster. The cluster network is dominated by the relationships between companies, whereby the latter are linked with the number of industry associations. Technological cooperation has been so

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intense in this area due to the activity of the Stanford University which – by creating the technology park called Stanford Research Park – provided the breeding ground for a dynamic development of new high-tech companies and for foreign companies to come and set up there.

These phenomena invite questions regarding not only the origins and the conditioning of the development of clusters and businesses centred around them, but their international development as well. The aim of the chapter is to present business clusters as a phenomenon present in different national economies and to demonstrate that – despite globalization processes, which seem to intuitively play down the importance of geographical proximity and the links between the entities which operate under such circumstances – clusters play a major role in creating the international competitive advantage of enterprises belonging to them. The chapter shall first discuss the essence of clusters as one of the possible forms of the concentration of economic activity. Then the concept of clusters will be distinguished from the concept of cluster organizations. The ensuing sections will present the essence and forms of cluster internationalization, which will be then illustrated in detail in the BioValley case study.

## 1. Clusters as a type of agglomeration

An attempt at putting clusters on the map of possible enterprise concentration should refer to one of the early studies by Malmberg, Sölvell and Zander [1996]. The researchers clearly indicated clusters as one of possible of agglomeration. Other types include urban agglomerations, industrial districts, creative or innovative regions and clusters. Alfred Marshall is considered to be the precursor of the cluster concept. He observed in his “Principles of Economics” of 1920 that companies benefit from operating in a geographical proximity and entering into both cooperative and confrontational relationships with other industry participants. The source of these benefits was the availability of high-qualified workforce, easier communication between market participants due to geographical proximity. The mobility of workers in a given location favoured the diffusion of information and unintentionally stimulated innovation. Marshall also noted that the functioning of enterprises may have been positively impacted by trade organizations operating nearby.

Thus, in the mid-1970s, an efficient organization of the industry was observed in the north-eastern and central Italy, which was based on small and medium-sized enterprises. Strong competition from supermarket chains entering the Italian market forced the owners of small shops and service providers to find effective ways of reducing operating costs. Intense relationships between entrepreneurs, employees, local authorities and educational institutions fostered an environment conducive



to the development and dissemination of innovation, mainly in manufacturing and design processes. Competing small and medium-sized companies started to cooperate, which enabled the achievement of economies of scale and operating at a scope on a par with large corporations. A new industrial district, which heralded the end of the mass production era, was labelled the Third Italy [Becattini 2002, pp. 92–93; Gancarczyk 2011, pp. 124–125]. Currently the Third Italy is one of the fastest-growing regions in northern Italy. The entities active in the Third Italy have no common management structure and capital ties. The cooperation is initiated by company owners who compete with one another, but at the same time there are strong cooperative links between them. Cooperative ties in the Third Italy are largely the result of a strong regional social capital and trust [Sölvell, Lindqvist and Ketels 2006, p. 87].

Another form of agglomeration are urban areas – the clusters of companies and industries concentrated in one location – in consideration of transportation costs and economies of scale. One of the most famous examples of metropolis in the world is New York, home to the headquarters of key global enterprises, including the headquarters of 45 corporations from the Fortune 500 list. The main financial institutions of the United States are located in New York City: New York Stock Exchange, numerous investment banks and financial advisory offices [Kozielska 2008; Rosenthal and Strange 2005]. In total, the financial services sector employs 200,000 residents [Smętowski, Jałowiecki and Gorzelak 2009, p. 10].

Another type of agglomeration are the industrial districts that bring together the companies involved in the value chain. Industrial districts constitute an environment conducive to flexible specialization and the achievement of economies of scale as well as the scope of operation in which the labour market grows, specialist skills are being enhanced, the interaction between customers and suppliers intensifies and local infrastructure is being distributed – as is the case with urban areas. Accordingly the Ruhr district was the largest industrial district in Germany and the European leader in coal mining and steel production. The development of mines in other countries, the introduction of new technologies and the global economic crisis triggered the restructuring of the region, however. At the turn of the 1960s and 1970s the demand for coal began to decline and coal mining became less profitable. High-tech industry came in place of the traditionally dominant industries.

The subsequent two agglomeration types provide benefits in the field of innovation. Innovative regions (or specialized regions) include companies representing various, not necessarily related industries, which stand out due to the presence of specialized skills and competencies in the region, where unplanned interactions can generate ideas for products, services and business concepts [Florida 2002]. In the Øresund region in the south of Sweden the dominant role is played by medicine, biotechnology, IT and telecommunications, environmental protection, logistics and food production. This is one of the most attractive areas in Europe

for knowledge-based economy, thanks to a close cooperation between 20 local universities, science parks, incubators, businesses and local governments. The region boasts the largest population of residents with higher education degrees in Northern Europe, low bureaucracy and corruption, high social capital and intensified cooperation between regional entities. Several platforms operate in the region, such as Øresund Food Network, Øresund IT Academy, Medicon Valley Academy, Øresund Environment Academy, Øresund Logistics, which developed their own databases. They bring together local entities and facilitate the flow of knowledge between them [Garlick, Kresl and Vaessen 2006, pp. 12, 30–32; Klimczuk-Kochańska 2012, pp. 50–53].

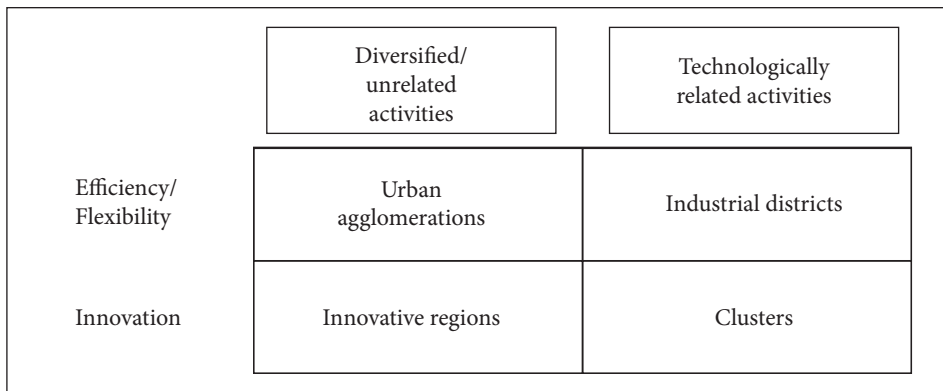


Figure 1. Four key types of agglomeration

Source: [Malmberg, Sölvell and Zander 1996]

The approach presented above identifies clusters as agglomerations where competitive advantage is based on the skills related to a certain location. They are based on time-varying agreements leading to interaction and the creation of knowledge and innovation (see Figure 1). The following sections will introduce the essence of clusters and cluster organizations.

## 2. Clusters and cluster organizations

In the literature of the subject we can find several definitions clusters<sup>2</sup>. The most popular is the approach of Porter [1998, p. 78] who defines a cluster as “a group of companies and associated institutions located in a geographic proximity and operating

<sup>2</sup> The presentation of the most popular definition of a cluster can be found in: [Gorynia and Jankowska 2008].

in a given field, which share affinity and complement one another.” Sölvel, Lindquist and Ketels [2003, pp. 18–19] point to the following components of clusters Sölvell:

- industry which constitutes the core of the cluster – companies in this industry are key participants of the cluster, generating high revenues, usually providing services in an international market;
- supporting industries – companies in these industries support the industry which constitutes the core of the cluster, they include the suppliers of machinery, materials, components, the providers of financial, marketing, design, *public relations* services. These companies are highly specialized and based close to the businesses from the industry located in the centre of the cluster;
- “soft” infrastructure – including local schools, universities, polytechnics, institutions of local self-government, economic development agencies, which provide support to the companies. The quality of the infrastructure is important for the cluster’s success, along with the cooperation between the entities;
- “hard” (traditional) infrastructure – roads, ports, waste management, telecommunications lines.

Ketels [2003] draws attention to important distinctive features of clusters. First, the companies – cluster members must be based in a sufficiently close proximity to one another for positive effects of diffusion to occur and to be able to use the same resources. Secondly, the activity of companies must be geared towards a common goal, to be able to take advantage of geographic proximity and interaction. Thirdly, the geographical proximity and orientation towards a common goal must be followed by the interactions between businesses. And finally, the interaction must occur between a sufficiently large number of participants – companies and institutions in order to achieve the so-called critical mass. DeBresson [1996, p. 161] points out that clusters are not “an ordinary concentration of independent businesses, but networks of interconnected, companies involved in a cooperation, operating in given sectors.” This cooperation takes various forms: joint implementation of large orders, the production of components for cluster participants, sharing access to machines, providing technical information, following a common marketing strategy. European Commission – Enterprise Directorate General [2003] adds that the clusters are independent companies that cooperate and at the same time compete with each other.

These features of clusters can be seen in high-technology cluster in Cambridge in the UK, called the European Silicon Valley or the Silicon Fen. In the mid-1970s, at the initiative and with funds of the University of Cambridge a technology park Cambridge Science Park was created, which became the seat of 65 companies with 2,170 employees [Stoerring 2005] within a decade. Reduced spending on research and development as well as privatization and redundancies in the sector of science meant that the regional labour market saw the appearance of a large number of highly qualified managers and researchers oriented on a new common

goal [Stoerring 2005]. Strong informal links between them and their high level of entrepreneurship contributed to the formation of a number of new, cooperating companies in the biotechnology and information technology sectors in the years to come. Successful start-up companies attracted new entrepreneurs to the region. A moderate size of the city facilitated entering into interaction and close cooperation between the companies. In the 1970s Cambridge came to be characterized by a high proportion of start-ups and a large number of spin-offs [Papaioannou and Rosiello 2009].

The notion of cluster is sometimes used interchangeably with cluster initiative or cluster organization, whereas each of them carries a different meaning. The cluster initiative is any action taken by the companies, the representatives of the public administration and the scientific sector with a view to developing the cluster [Sölvell, Lindquist and Ketels 2003]. If the cluster initiative is formalized, a cluster organization comes into existence, having a legal personality and representing the interests of its members, which naturally becomes a platform for cooperation. Its activity helps to reduce the asymmetry of information and also favours reducing opportunistic behaviour. Cluster organization is a tangible manifestation of the cooperation between the cluster participants, usually it does not include all the cluster entities, however. The formalisation of cluster initiatives leads to the formation of associations, foundations, commercial companies which act as formal cluster coordinators. An example of cluster organization is Aviation Valley in the Podkarpackie province, the first high-tech cluster organization in Poland, established in 2003. The Podkarpackie province has a decades-long tradition of aviation industry and a significant concentration of companies from this sector; the region is home to about 90% of domestic production in aviation industry. In addition, local enterprises have developed educational and scientific research facilities and work closely with local authorities. In total, the cluster is supported by over 100 entities [Radomska 2011, pp. 9–11].

### 3. The internationalization of clusters – the conceptual foundation

Achieving competitive advantage by cluster enterprises as a result of the above mentioned properties of the cluster means that they go into competition not only with domestic, but also with international competitors. Competing with foreign entities is usually accompanied by active or passive internationalization of the cluster members over time, and even the internationalization of the cluster as a separate structure represented by the cluster organization.

Sölvell [2009, pp. 18–19] demonstrates that internationalization is characteristic of dynamic clusters in which numerous and complex interactions occur internally

between the cluster participants as well as externally with the entities outside the cluster. Cluster internationalization denotes cluster companies entering into interactions with foreign entities belonging to the cluster on one hand, or between cluster companies and foreign market entities. On the other hand, it involves the development of relations between the cluster organization representing a given cluster and other foreign entities outside the cluster. With respect to clusters we can talk about internationalization in objective and subjective terms [Jankowska 2010; 2011; 2013].

Internationalization in objective terms is realized by the activity of enterprises belonging to cluster or entering cluster. Internationalization can be active and passive, depending on the role assumed by cluster enterprises and foreign entities which interact with the cluster. Passive internationalization involves building relationships with foreign entities without expanding beyond the home market. Active internationalization requires entry into a foreign market either through exports, cooperative modes or an independent activity on a foreign market in the form of branches and subsidiaries. An example of active and passive internationalization of companies in the cluster near the city of Montebelluna in north-eastern Italy, in the Veneto region, which is a worldwide known footwear industry centre. Montebelluna accounts for 80% of world motorcycle boots production, 75% of ski boots production, 50% as regards trekking boots and 25% roller skating boots. Since the 1970s the world's leading companies from the footwear industry (e.g. Decathlon, McKinley, Reebok, Timberland, Fila, Asics, Umbro, Rossignol) began to run their R & D departments in Montebelluna and initiated the cooperation with local footwear companies. The international success of companies such as Rolerblade and Geox [Andriani 2005, p. 13; The Cluster 2008, pp. 11–12] comes from this region. Montebelluna proves that global companies can delocalize a part of their innovative activities and effectively cooperate with local entrepreneurs. In addition, the cooperation of the shoe companies from Montebelluna with subcontractors from Eastern Europe shows that the transferring of particular activities in the value chain to other countries can be a cluster's success [Andriani 2005, p. 13].

Another example of passive and active internationalization from the objective point of view was a Danish cluster NorCOM from North Jutland, now integrated into the ICTNorCOM network. The cluster participants were globally known ICT giants. The cluster was primarily composed of research and development units from private Danish companies and foreign corporations, with the US entities being in the lead. A major group in the cluster was represented by the companies from Norway, Germany, the UK and Sweden. In total, 22 companies participated in the association, or formalized cluster represented by the cluster organization, with 10 being Danish entities and 12 foreign companies, for example Motorola, RF Micro-devices (USA), Rohde & Schwarz (Germany), Texas Instruments (USA). A strong presence of foreign entities in the cluster was a testament to the attractiveness of

this environment in the eyes of foreign investors seeking the locations offering specific competencies. The main result of the cluster existence, however, was the development of competencies of Danish companies and accelerated internationalization of Danish entities.

Subjective cluster internationalization pertains to formalized clusters and is essentially associated with the activity of the cluster organization. The efficiency of the cluster organization efforts is verified by their internationalization of cluster companies; the ties established by cluster organizations should facilitate more intensive international expansion of cluster companies and their greater involvement in transnational value chains.

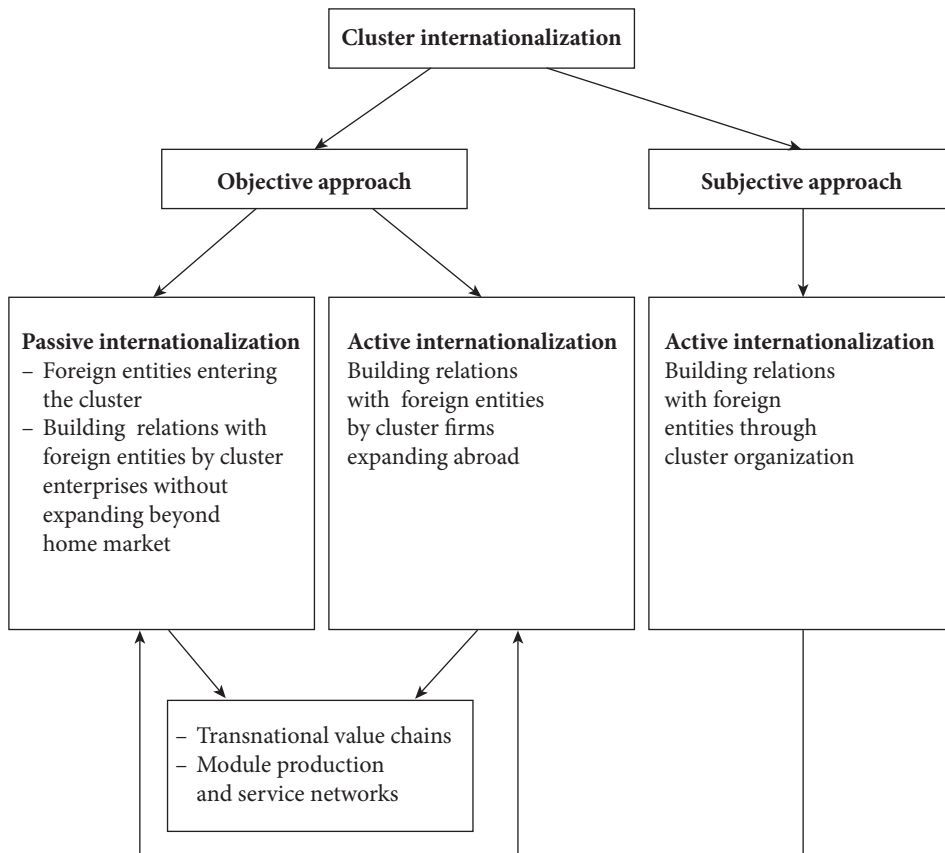


Figure 2. The conceptualization of cluster internationalization

Source: Study based on: [Jankowska 2013, p. 15]

Subjective cluster internationalization manifests, among others, in building links between cluster organizations from different countries and is currently one

of the priorities of the European Union, which is reflected in the cluster policy programmed and implemented at the level of EU countries. The European Commission is aware of the enormous competitive pressures that the European economy is put under by the Asian economies, in particular from China and India, the economies of South America and the United States, hence the imperative to develop trans-regional and transnational cooperation through clusters. This cooperation has the potential to create clusters that will become a part of transnational value chains. Today such types of clusters are referred to as *world-class clusters*.

#### The European Strategic Partnerships

Name	Industry	Partners/Countries	Target countries
European Lighting Cluster Alliance – ELCA	Lighting technologies	11 partners from 10 countries (Denmark, Belgium, Estonia, Finland, France, Netherlands, Germany, Sweden, United Kingdom, Italy)	China
European Aerospace Cluster Partnership – EACP	Aerospace	9 partners from 5 countries (Estonia, France, Germany, Portugal, Italy)	United States, Canada, Japan
ICT4Future	ICT	7 partners from 5 countries (Denmark, Estonia, Finland, Germany, Sweden)	United States, Brazil, Russia
European Sports Cluster Partnership	Sport	5 partners from 4 countries (Estonia, France, the Netherlands, Italy)	United States, Taiwan, South Korea, Japan, Brazil, Argentina, Chile
European Semiconductor Cluster Consortium – ESCC	Micro and nanoelectronics	6 partners from 6 countries (Belgium, France, Greece, the Netherlands, Germany, Italy)	United States, Taiwan, South Korea, Israel, China
Food, Health & Wellbeing Partnership	Food	12 partners from 9 countries (Austria, Estonia, France, the Netherlands, Germany, Poland, Hungary, Italy, Israel)	Israel, Chile, the United States, Brazil, India, China
Textile2020	Advanced textiles	8 partners from 6 countries (Czech Republic, Estonia, France, Germany, Great Britain, Italy)	Brazil, Japan, South Korea, Tunisia, Morocco, Canada, the United States, India
ESCP Energy in Water	Environmental technologies	9 partners from 8 countries (Denmark, Estonia, Finland, France, Germany, Poland, Sweden, United Kingdom)	United States, Canada, Brazil, China, the Mediterranean region, the Baltic Sea Region, most likely India
Mind the Gap – Health and Wellbeing for elderly	New materials	7 partners from 5 countries (Denmark, Estonia, Finland, Germany, Sweden)	Brazil, Russia, India, China
International Clean Tech Network – ICN	Cleantech	13 partners 12 countries (Austria, China, Denmark, Estonia, France, Canada, South Korea, Germany, Norway, Singapore, United States, Italy)	United States, Singapore, South Korea, China, Canada

Cont. Table

Name	Industry	Partners/Countries	Target countries
Photonics & Packaging for Innovation – 3P4I	Packaging and value chain in the food industry	5 partners from 3 countries (Denmark, Estonia, France)	–
ESCP for Personalized Healthcare	Healthcare	5 partners from 5 countries (Estonia, France, Germany, Italy, United Kingdom)	United States, China, Brazil, Japan, South Korea, North Africa
Natural Resource Efficient Europe – Natureef	Exploitation of natural resources	10 partners from 10 countries (Austria, Belgium, Czech Republic, Denmark, Estonia, France, Germany, Poland, Hungary)	China, India, South America, Australia, New Zealand

Source: [Cluster Collaboration 2015].

In May 2013 a decision was made to establish 13 strategic partnerships of cluster organizations (*European Cluster Strategic Partnerships*), which are oriented to specific industries and expansion in specific foreign markets (table). There are also cluster organizations from Poland among the partners. They participate in the agreements focused on natural resources, food and green technologies. Cluster organizations involved in various partnerships are to derive benefits from the participation in foreign trade missions organized by the European Commission.

Internationalisation is characteristic of mature clusters. The issue of cluster life cycle drew the attention of researchers [Andersson 2005; European Network 2002; Smith 2008; Sölvell 2009]. Zu Köcker and Buhl [2007] demonstrate how internationalization needs of cluster participants change as maturation progresses (Figure 3). The internationalization process evolves from the least demanding forms towards those based on the involvement of capital, as well as from individual markets towards markets groups, in a fashion similar to the Uppsala internationalization model [see: Jankowska and Główska 2016]. First, there is a sporadic activity of clustered companies on foreign markets, the entries of foreign entities in the cluster, or undertaking internationalization efforts by the cluster organization itself. Then cluster companies go for more expansive internationalization strategies than export or import, and get involved in transnational value chains, expanding modular production and service networks, which is possible thanks to the fact that cluster companies specialize in a selected chain link. This specialization enables the formation of links with the flow of knowledge between cluster participants. Multinationals play a key role in the process and global knowledge flow channels are being spoken of [Bathelt, Malmberg and Maskell 2004]. The efficiency of knowledge transfer is influenced by the trust and social relations developed in the channel. By entering transnational value chains clusters contribute to the creation of modular production networks [Sturgeon 2003]. A characteristic feature of these networks is the dispersion of selected value chain links and a simultaneous concentration



of those links that generate higher added value in clusters, offer advanced location advantage, which means in particular knowledge resources. The formation of modular production networks is associated with the processes of relocation, which have occurred in Italian industrial districts since 2007 due to globalization and economic crisis [Belussi and Sammarra 2010].

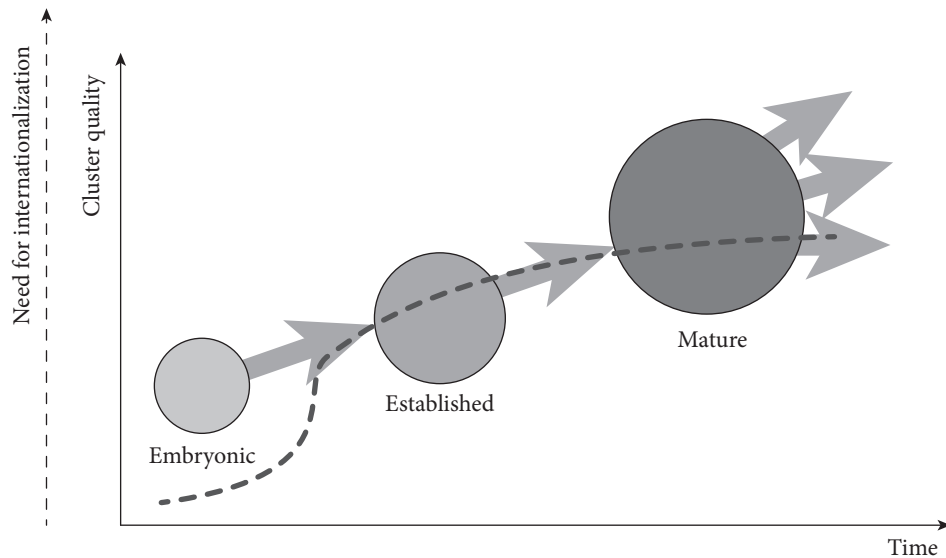


Figure 3. The evolution of internationalization needs depending on the cluster life cycle

Source: [zu Köcker and Buhl 2007, p. 11]

#### 4. Internationalisation of the BioValley cluster – a case study

BioValley biotechnology cluster is a unique example of cross-border cooperation between France, Germany and Switzerland. The cluster entities include about 600 enterprises, 40 research centres and 5 universities employing 280 research groups. BioValley cluster owes its origins to Swiss entrepreneurs Georg Endress and Hans Birner who, having observed the development of the US Silicon Valley in the 1980s, decided to launch a similar initiative specializing in biotechnology in the Upper Rhine region. The idea was feasible due to the merger of two pharmaceutical companies Ciba-Geigy and Sandoz in 1996, which resulted in the creation of the Novartis corporation. Novartis established its regional headquarters in the region and dismissed over 3,000 high-skilled biotechnology employees as part of the changes implemented following the merger. Endress and Birner founded the Bio-

Valley initiative, which was to contribute to creating new jobs in the biotechnology industry. The creators of the initiative were aware that the greatest strength of Upper Rhine was educated, highly motivated workforce. Local employees were, according to the founders, loyal, trustworthy, and at the same time innovative and oriented towards the development of future technology and cooperation [Byrum 2004].

Over time, the region came to be characterized by high innovation potential, particularly in the field of biotechnology. In the mid-1990s it manifested mainly in the presence of the headquarters and branches of the world's leading pharmaceutical and chemical companies, such as Novartis, Roche, Clariant, Lonza, Syngenta, DSM, Johnson & Johnson, Eli Lilly, Bayer, Abbott, BASF, DSM, Pfizer, Sanofi – Aventis, DuPont, Amersham and Millipore. The region was also home to five renowned universities and scientific institutions offering training in the fields related to biotechnology.

The birth of the BioValley initiative coincided with the development of cluster policy in Germany. In 1995, the German Ministry of Education and Research launched the *Bio Regio Competition* for the region with the fastest-growing biotechnology industry. The initiative was addressed to new biotech clusters, still at an embryonic stage. As many as 17 applications were filed, with awards granted to three of them. The winning clusters received about 90 million euros of financial support. The program was considered a great success, despite the fact that currently the largest clusters in the field of biotechnology in Germany are those who failed to win the competition [Baranowska et al. 2009]. BioValley was among the initiatives which failed in the Bio Regio Competition.

BioValley project assuming cross-border cooperation between the three regions quickly attracted the attention of the media and the authorities. One year after the inception the idea was recognized by the European Union and the initiative received a grant of 2.2 million euros through the INTERREG II in 1997–2001. A year later the organizational structure of the cluster was established thanks to received support. Representatives from each of the states set up their own national associations under the auspices of the central BioValley Central Association, i.e. BioValley Platform Basel, BioValley Deutschland e.V. and Association Alsace BioValley [Byrum 2004]. In addition to expanding the structure of the cluster, INTERREG funds were also aimed at ensuring international competitive advantage of the tri-national region, the development of innovative infrastructure and the provision of support for start-ups, including financial support in the form of venture capital. An important goal was also to intensify the links between the entities from science and business as well as the cooperation between them, and promote the BioValley brand outside the region. It is worth noting that in this particular case of cross-border cooperation, it was also important to overcome the obstacles related to distinctive cultural, linguistic, political-administrative and legal identities of the three cooperating regions [Boyé et al. 2012].

The BioValley benefiting from the pool of INTERREG III funds in 2002–2007 brought about positive effects – a profound development of the cluster services and the establishment of 150 new businesses in the region. The support was mostly used for the promotion of activities and strengthening the cooperation within the cluster (e.g. through monthly meetings, an active website, a member profile database). The cluster has set itself the goal of gaining gradual independence from public funds [Byrum 2004]. In recent years, 2008–2012, BioValley benefited from the INTERREG IV funds. The main objectives of this program were:

- registering the supply and demand of local companies in the field of technology and innovation through individual talks,
- understanding the specific competencies and production capacity of regional research institutes,
- supporting a young talent development program
- initiating potential partnership agreements with regard to the current support programs such as the European *Innovative Medicines Initiative*,
- organizing meetings intended to enable the collaboration between new partners,
- presenting the region and the cluster internationally at trade fairs and congresses,
- designing a “map” showing the ties of the cluster members from the area of science and business, facilitating further cooperation between the parties,
- organizing a biotechnology week *BioValley Life Sciences Week* [Boyé et al. 2012].

In addition to the support from such aid programs as INTERREG, the activities of the cluster are currently funded from membership fees, which are determined separately by the three regional associations. For example, members of the Alsace BioValley Association are obliged to pay an annual fee of 10 euros for students and 500 euros for companies employing over 100 employees. Separate rates have been set in the BioValley Deutschland e.V, where the members pay 30 euros per individual and up to 150 euros per enterprise. On the other hand, in the BioValley Platform Basel the charge is 25 CHF for students, CHF for 75 individuals and 300 CHF for entrepreneurs [Byrum 2004].

Now, after 18 years in operation, the BioValley cluster is one of the most successful biotech clusters in Europe, next to the biotechnology cluster in Cambridge and the Medicon Valley in Copenhagen. The cluster brings together 600 pharmaceutical companies involved in cooperation which provide 50,000 jobs, of which over 40% are the largest pharmaceutical companies in the world. The cluster members can use an advanced research base in the form of 14 biotech science parks and more than 30 specialized technology platforms. Thanks to the activities of the BioValley, five local researchers won the Nobel Prize in chemistry and medicine. The number of start-ups in the period 1997–2012 increased from 40 to 200 companies per year. Among the start-up companies have recently managed to go public, for example Actelion, Arpida, Basilea Pharmaceutica or Speedel Pharma. The region is in possession of 416 patents per million inhabitants in the field of biotechnology, with

the average for Western Europe at 258 patents [Pomorskie Inicjatywy 2013; Boyé et al. 2012].

Effective cluster activity had an impact on regional statistics. In 2010, the population of the Upper Rhine exceeded 6 million. Within ten years there has been a population growth of 5% (284,300 people). At the same time the economic power of the region also increased, which is best illustrated by a 30% GDP growth and a significant growth in GDP *per capita* in individual areas (cf. Figure 4) [Boyé et al. 2012].

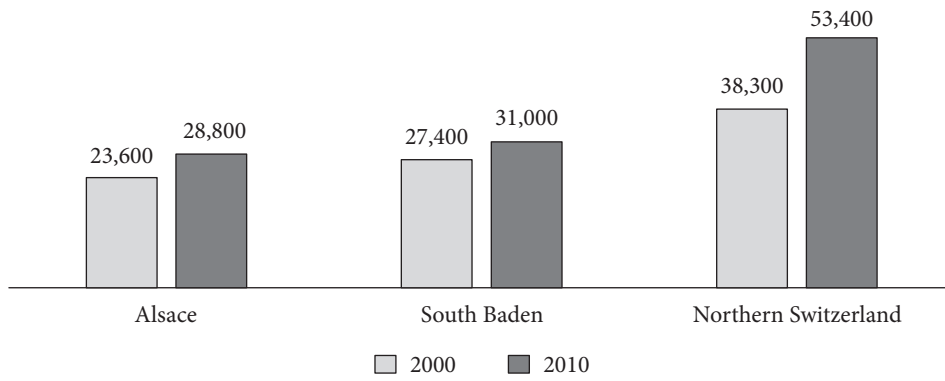


Figure 4. GDP *per capita* in 2000–2010 (in €)

Source: Own study based on: [Boyé et al. 2012]

The activity of the cluster also contributed to changes in the manner of seeking and undertaking employment. As many as 96,000 out of 3.1 million of professionally active people resided at the Upper Rhine commute to neighbouring countries. 66% of mobile workers come from Alsace, and 33% from South Baden. The chosen place of work is in three-quarters of cases Northern Switzerland, and one-fourth – South Baden. The unemployment rate in Alsace was 8.5% in 2012, which is lower than in the entire France (9.4%). On the other hand, Northern Switzerland recorded in 2012 an exceptionally low unemployment rate – at 3%. South Baden boasts a similar rate of unemployment, where in the years 1987–2011 there was a 25% increase in the number of people employed, with a 12% growth for the whole of the state Baden-Württemberg [Boyé et al. 2012].

The BioValley cluster's success can be attributed to several factors. Among them, attention should be paid to a strong scientific base, consisting of five renowned universities, employing 15,000 researchers, educating 100,000 students in disciplines related to biotechnology. The level of teaching and research should be considered very high. For example, the University of Strasbourg was ranked as 14<sup>th</sup> in the Shanghai ranking in 2011 in chemistry, and the University of Basel – 34<sup>th</sup> in pharmaceuticals. On top of the above the region is home to a significant number

of companies from biotechnology and innovative infrastructure including three technology parks and incubators in the Alsace region, four in South Baden and seven in Northern Switzerland. The factors which drive the development of the cluster include high availability of financial resources, among others the proximity of the Swiss stock exchange and Novartis Venture Fund as well as several similar *venture capital* funds as well as the presence of highly skilled workforce, since about 15% of the total economically active population in South Baden is employed in the biotechnology industry. Finally, attention should be given to optimism and mutual inspiration in neighbouring regions [Boyé et al. 2012] as well as the cluster's engagement in bringing together potential partners in the region. A fine example would be a database (in operation since 1998) which contains the companies and the results of the research carried out by local scientists (publications, PhDs, patents, etc.) intended to facilitate the cooperation between them [Noji and Omiya 2013].

## Conclusions

The chapter captures the nature and conditions of the development of clusters as an example of the agglomeration of economic activity, which has a significant impact on the competitiveness of enterprises. Particular attention was given to the phenomenon of cluster internationalization, with a distinction drawn between the objective perspective – related to active and passive internationalization of the companies belonging to a cluster, and the subjective perspective, related to the actions taken by the cluster organizations with a view to intensifying international cooperation. In this discussion of both forms of internationalization the concept of cluster and cluster organization were delimited. It should be emphasized that each cluster organization should have a corresponding active cluster operating in business practice, whereas a given cluster does not necessarily have to have a corresponding cluster organization. Sometimes cluster organizations are created by artificial means, when in fact no cluster actually exists. Under such circumstances it is difficult to expect any advantages characteristic of a cluster environment.

The BioValley case study was employed to present a number of cluster internationalization conditions. It transpires that the development of international competitive and cooperative relations between companies in clusters located in various countries is considerably enhanced by effective cooperation at the level of cluster organizations, which is conducive to creating a trans-border platform of interaction between business entities from the sector, as well as supporting sectors. The primary effect of the existence of clusters may be the development of the competencies of local businesses and the acceleration of their internationalization process, which requires concerted effort at the level of cluster organizations.

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# Knowledge transfer in manufacturing companies in the internationalisation process of a company

## Introduction

In the face of increasingly competitive pressure, ongoing globalisation processes and the development of new technologies, enterprises are forced to continuously create, develop and, above all, transfer new resources, particularly knowledge. Knowledge transfer is one of the key elements determining the competitive position of a company. As a result of their international activity, manufacturing enterprises may encounter more problems in knowledge transfer process than operating only on a local market. Therefore, it is important which measures should production enterprises undertake in order to encourage and support employees in knowledge transfer in the internationalisation process<sup>2</sup>.

## 1. Knowledge transfer in enterprises – analysis and determinants

One of the key conditions for effective competition in the internationalisation process is appropriate dissemination of knowledge, that is its transfer. The knowledge transfer process includes transmission and assimilation of knowledge and may occur during the interaction between employees, cooperation with the closest business partners, exchange of documents and information, knowledge acquisition from external sources or via a combination of these elements. Through their own skills

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<sup>2</sup> The empirical data used in the article have been collected in the research financed by the National Science Center (Narodowe Centrum Nauki) conducted as part of the Preludium grant, awarded under the decision no. DEC-2011/03/N/HS4/00429 (project leader: Marcin Soniewicki).

and experience, employees create new knowledge. Due to its transfer, knowledge may be constantly enriched and modified with elements specific to a given business relationship. As a result a unique strategic knowledge arises, which allows the company to become more competitive in the internationalisation process. Considering its degree of availability, understanding and ease of transfer, knowledge can be divided into explicit or implicit. Explicit knowledge is available to all and easy to understand and transfer. It can take a form of documents, regulations or rules of conduct. Implicit knowledge is created as a result of the experience, transformation and adjustment of existing resources, direct observation or participation in an activity. It is inseparable from a person, his or her experience and beliefs, which makes it difficult to verbalise.

The knowledge transferred between employees of a company in the internationalisation process is unique for each relationship and is characterized by different content, level of sophistication or degree of transparency. Furthermore, the transfer process is individual and depends on the specific context of cooperation, existing social networks, previous experience and the kind of knowledge exchanged. Knowledge circulating in an enterprise is not clearly explicit or implicit – it should be perceived through the prism of a continuum, where at one end there is the explicitity and on the other end – implicitity of knowledge [Kogut and Zander 1993, pp. 626–627]. Depending on the specific characteristics of a company, the industry in which it operates, or performing activity, the dominant type of knowledge changes, which implies the use of other tools of transfer. In the case of explicit knowledge, easy to understand and interpret, the transfer may apply a more formal approach. This knowledge is easy to code; therefore, it can be transmitted electronically and stored in databases without a significant impact on its contents. Implicit knowledge, due to its immaterial dimension, is difficult to translate in a straightforward manner and therefore requires the use of a more personalized approach to the transfer. The social networks, the level of trust between the employees and previous experience in cooperation are of significance in its transmission. The tools used in the transfer of this type of knowledge include participation in the projects, observations, informal meetings or activity in the communities of practitioners.

Knowledge transfer between employees influences a company's competitive position. However, achieving a competitive advantage by a company is determined by integration of its resources and their application in the production process. Hence, it can be assumed that in the context of knowledge transfer, competitive advantage depends on a company's ability to continually reconfigure knowledge resources held by the company and its employees. The scope of adaptation depends on a strategy and the needs of the enterprise. It can replicate the resource (i.e. apply the obtained knowledge in the same or a slightly modified form), or adapt it (match

the resource to requirements and the specifics of the company) [Williams 2007, p. 869]. Sometimes, in order to gain the advanced implicit knowledge, a company should move employees between its departments and even subsidiaries. In the context of international business, such an approach to the transfer is extremely cost-intensive. However, the abandonment of allocation may make the company unable to produce a given kind of knowledge within their own structures, which may significantly worsen its competitive position on the market in the internationalisation process.

Another element affecting knowledge transfer in the internationalisation process is the cultural environment of people involved in the process and the context in which the transfer takes place. The transfer of implicit knowledge is, without a doubt, a challenge for a company operating in the international environment. Cultural differences, different organizational cultures, existing social networks, as well as different levels of absorption capacity between the people may create problems and sometimes even barriers to knowledge transfer in a manufacturing company in the internationalisation process. Additional potential barrier in the knowledge transfer is the complexity of processes in manufacturing companies operating in different cultural environments. These factors may adversely affect the processes of exchange of knowledge, especially in complex manufacturing systems.

A company's strategy aimed at supporting knowledge transfer should focus on the analysis and the development of social networks, creating an environment that encourages knowledge sharing with colleagues, support for this process by senior managers and the active creation of an organizational culture that promotes the transfer of this resource within an enterprise in the internationalisation process. It can be assumed that similar skills, commitment and high absorption capacity of cooperating employees have a significant, positive impact on the effects of the knowledge transfer.

The cooperation is a key factor in promoting the knowledge transfer. Under certain conditions, however, it may hinder this process, transforming itself into negative collaboration. This problem may occur when employees are oriented only towards their own professional development and as a result cease their cooperation in favour of competition within a company. A key aspect determining efficient and continuous knowledge transfer in a company is the continuous supervision of this process and promoting collaboration within the enterprise. The managers should motivate subordinates to develop their knowledge by allowing employees to pursue their own development and achieve the professional goals. Along with this process the managers should also promote cooperation and knowledge transfer within the enterprise. Business goals set up by superiors should account for personal aspirations of employees who in effect will identify with it and become more actively involved in the process of knowledge transfer.

## 2. Manufacturing companies in the context of knowledge transfer

Employees of manufacturing companies need and use knowledge covering specific and often advanced areas of their activity. While performing assigned tasks, they acquire experience, which allows them to effectively perform the delegated work [Kim, Hwang and Suh 2003, p. 260]. Experience and related skills are often intangible in their nature and thus are largely inseparable from employees. The creation of advanced, specialized knowledge is not a simple and quick process – key, strategic knowledge resources are created and developed for a long time. Providing and supporting relevant mechanisms for determining the knowledge transfer in the internationalisation process is particularly important in manufacturing companies, whose operations are based on the number of co-existing sequential production sub-processes. With the appropriate transfer mechanisms, knowledge may be exchanged and enriched, thus contributing to the success of a production company in the internationalisation process.

The nature of work in manufacturing companies may be a challenge in the knowledge transfer process. Workers in such entities become specialists in their field of activity with an acquired professional experience. Quite a narrow specialisation may be an obstacle in sharing knowledge with colleagues from other departments – specialists from other fields. Knowledge transfer of may be limited despite the potentially large resources of existing knowledge across the enterprise. To overcome these barriers the interaction between employees should be supported. Interactions may be formal in nature, for example, occur during the exchange of documents. They can also take an informal nature and ultimately contribute to the development of social networks within a production enterprise, thus contributing to improvement of knowledge transfer in manufacturing companies. In particular, this aspect is crucial in the context of the knowledge transfer. The literature emphasises that informal social networks facilitate and intensify the sharing of resources, especially knowledge. The combination of formal and informal relations in the knowledge transfer process enables obtaining greater amounts of often more advanced information on the manufacturing operations of an enterprise. Furthermore, building good relations with the environment will enable better control and observation of market processes, help identify the needs of customers or facilitate the acquisition of new information and access to best practices, including competitors operating on the foreign market.

### 3. Classification of manufacturing companies

Based on the approach adopted by the OECD and Eurostat, there are three methods of delimitation of high technology manufacturing companies [Eurostat 2015]:

- sector approach, which analyses production companies operating in the sector of high technology, medium high-technology and the high-technology knowledge intensive service sector;
- product approach, which divides the companies into high technology and others due to technical sophistication of a product (regardless of industry);
- patent approach, which separates high-tech companies obtaining patents from others.

The sector approach differentiates manufacturing companies due to the intensity of research and development operations (as measured by the relation of expenditure on research and development to value added) and is based on the Statistical Classification of Economic Activities in the European Community (NACE) at the two – or three-digit level. Using aggregate indicators, manufacturing companies are divided into four classes of industry: high-technology, medium-high-technology, medium-low-technology and low-technology [Hatzichronoglou 1997, p. 5]. The intensity of the research and development of manufacturing enterprises is measured by an aggregate index including the relation of direct expenditures on research and development to the value added, to the value of production and the relation of these expenditures with indirect expenditure to the production value [Szewczyk 2014, p. 280]. In high-technology companies, the intensity of research and development exceeds 7%, in medium-high-technology companies it falls between 2.5% and 7%, in medium-low-technology entities the intensity of research and development varies between 1% and 2.5%, and in low-technology enterprises, the ratio is less than 1% [Szewczyk 2014, p. 280]. Based on research, it is assumed that in high-technology enterprises spending on research and development is between 8 and 15 per cent of income, and in medium-high-technology enterprises these expenses fall within the range of 2 to 4 per cent [Dzikowski and Tomaszewski 2014, p. 387].

Product classification was developed jointly by the OECD and Eurostat in order to create an instrument for the analysis of international trade more suitable than the sectoral approach. This classification covers only products of high technology. The product approach complements the sectoral approach and allows for a much more detailed analysis of trade and competitiveness. The list of high technology products was created based on the intensity of research and development (measured by the relation of expenditure on research and development to sales totals) according to product groups. The groups classified as high technology products are aggregated

based on the Standard International Trade Classification (SITC). However, due to the lack of static data, this classification, as well as the patent approach, is not commonly used in the analysis and categorisation of enterprises.

#### 4. Internationalisation of enterprises – contemporary trends

The economic development and progressing globalisation bring about a change in the approach of manufacturing enterprises to the internationalisation process. Some manufacturing companies bypass the initial stages of international expansion and despite the lack of knowledge and international experience are able to operate effectively in a new market, by engaging significant resources in the process and reaching planned objectives in a short time. For these companies, their age and international experience are not important factors for success [Xue, Zheng and Lund 2013, p. 143]. In terms of technological progress and globalisation, skills of employees are of great significance for their success in the internationalisation process. Lack of international experience can be overcome by appropriate development of human resources within an enterprise or by acquiring necessary information from the outside of an enterprise. Interaction and transfer of knowledge can facilitate the internationalisation process in case of insufficient experience in internationalisation, or when a company wants to operate globally as a rule. Due to the cooperation with external partners, employees can draw knowledge from diversified sources, thus compensating for own missing or insufficient resources and in effect develop new knowledge [Hauke-Lopes 2014, p. 15]. As a result of multi-level knowledge transfer, the entry of manufacturing enterprises to new foreign markets is greatly facilitated.

There are two main areas of action to promote the knowledge transfer in manufacturing companies in the internationalisation process. The first area covers activities related to cooperation within a company, aimed at the development of social networks, informal links or contacts between employees. They include casual employee meetings in the workplace or regular meetings of superiors with subordinates. Other tools supporting the transfer of knowledge in manufacturing companies are frequent cooperation between employees from various departments, including informal contacts or enabling and encouraging employees to work in teams. The second area of activities related to the promotion of knowledge transfer should include measures aimed at creating and disseminating new knowledge. Examples of activities are for example disseminating best practices of other companies, including major competitors, and efforts to eliminate obstacles and promote the transfer of knowledge in a company. In addition, in order to

allow continuous development of employees, knowledge should be available to all employees whenever they need it.

## 5. Methodology

The article is based on the results of quantitative empirical research. It has been performed in the framework of the research project “The role of orientation towards knowledge in developing the competitive advantage of a company in the internationalisation process”<sup>3</sup>. The study was conducted in 2012–2013 across Poland. The sampling frame was the Kompass Poland database. Two methods of questionnaire distribution were used. The first one was electronic forwarding. The project manager, based on their experience and the help of an IT specialist, perfected the existing surveying system. This tool enabled the dispatch to respondents of personalized links to interactive questionnaires via e-mail. The personalisation enabled also sending reminders only to those who failed to complete the questionnaires by a certain point. This system also allowed for greater control over the entire process of research. The second method was sending questionnaires by post. The need to use physical mail was due to the fact that the conditions of use of the Kompass Poland database prevented the e-mail dispatch to some companies in the database.

A key element in the preparation of the study was to create a reliable questionnaire. This research tool was created on the basis of a comprehensive analysis of the literature. Each question contained therein had a reference to the relevant literature discussions justifying its existence. The tool consisted of six sections. This article is based on part of the questionnaire relating to the transfer and dissemination of knowledge in a company. The respondents evaluated to what extent they agree with the individual statements using a 5-point Likert scale. These statements fell within three groups (Table 1).

This article focuses solely on manufacturing companies. Further subdivision has been applied among these entities, as developed by the OECD [Hatzichronoglou 1997]. The only difference compared to the original OECD division is the combination of two groups of entities, which manufacture low-technology and medium-low-technology products in the study. In total, the article analyses 331 companies. The specific characteristics of production companies included in the sample are presented in Tables 2, 3 and 4.

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<sup>3</sup> The project was financed from the funds of the National Science Center based on decision number DEC-2011/03/N/HS4/00429 (project leader: Marcin Soniewicki).

Table 1. List of questions regarding knowledge transfer asked of respondents in the empirical study divided into groups

Group	Essence of question	Full content of question
Cooperation in the enterprise	Joint meetings	Our company ensures conditions for joint meetings and exchange of experience, e.g. staff rooms or canteens
	Cooperation between departments	Employees of different departments of our company often work together (informally or formally)
	Managers and employees	Managers in our company (individually or collectively) often meet with employees
	Team work	In our company, if possible, we introduce team work
Constant development	Dissemination of best practices of other companies	The best practices of other companies (e.g. competitors) are regularly disseminated in our company
	Continuous improvement of transfer of information and knowledge	In our company, continuous efforts are made to improve the flow of information and knowledge
Subjective assessment of effectiveness of information and knowledge transfer	Obtaining information needed	All employees of our company and the management usually do not have problems with obtaining information and knowledge they need at the time

Source: [Soniewicki 2015] based on: [Busch 2008, p. 27; Darroch 2003, p. 45, 46; Geisler and Wickramasinghe 2009, p. 13; Wang et al. 2009, p. 119; Mazur, Rószkiewicz and Strzyżewska 2008, p. 152].

Table 2. Level of technology of products manufactured by the surveyed companies according to the OECD division

Level of technology	Number of enterprises
Low and medium-low technology	179
Medium-high technology	114
High technology	38
Total	331

As shown in Table 2, the sample has most entities manufacturing low and medium-low technology products. This is partly due to the fact that this group includes two types of companies from the OECD division. Unfortunately, it should be noted that the study included relatively few entities producing high technology products. Therefore, groups of companies, which manufacture medium-high, and high technology products were combined as part of the analyses carried out in this article.

One of the criteria used in the analysis was employment levels in the analysed enterprises (Table 3). It is particularly important in the context of issues of transfer and dissemination of information and knowledge in enterprises, since the scale of the size of the entity determines the opportunities and challenges of a company in the analysed topic. The studied sample was dominated by small (10–49 employees) and medium-sized companies (50–249 employees).



Table 3. Level of employment in the surveyed companies

Employment	Number of enterprises
Below 10	57
10–49	133
50–249	107
250 and above	34
Total	331

An important element of the article is a distinction between companies in the internationalisation process and those operating only in local markets. The details are shown in Table 4.

Table 4. The scope of operations of the surveyed companies

Scope of operations	Number of enterprises
Company operating locally	72
Company in the process of internationalisation	259
Total	331

In this article, companies in the internationalisation process have been distinguished on the basis of foreign sales. The companies involved in foreign markets included the entities, which stated that at least some of their products are sold abroad. As shown in Table 4, up to 78% of the manufacturing companies belong to this group.

## 6. Research results

This section presents the results of empirical, quantitative research on intensity of knowledge transfer in various types of manufacturing companies. The results were presented in a variety of systems in order to present the most accurate correlation between the characteristics of a production company and its activities relating to the transfer and dissemination of information and knowledge.

The first analysis concerns the level of the three indicators emphasised in the article: cooperation in the enterprise, continuous development and subjective assessment of the effectiveness of the transfer of information and knowledge among manufacturing companies manufacturing products with various levels of technology (Table 5).

Table 5. Values of indicators for the transfer of knowledge in manufacturing companies, depending on the level of technology of their products

Group of questions	Technology		
	Low and medium-low technology	Medium-high technology	High technology
Cooperation in the enterprise	3.77	3.86	<b>3.99</b>
Continuous development	3.35	3.43	<b>3.49</b>
Subjective assessment of effectiveness of transfer of information and knowledge	3.65	3.76	<b>4.00</b>

The most important conclusion from Table 5 is that the higher the level of technology of products manufactured by the company, the higher the intensity of activity in all groups of issues. The biggest differences between the types of entities can be seen with regard to the last indicator – subjective assessment of effectiveness of information and knowledge transfer. Among others, the differences are somewhat smaller and more importantly – proportionate. A more detailed analysis in this respect is presented in Table 6.

Table 6. Answers to individual questions in the surveyed enterprises, depending on the level of technology of their products

Question	Technology		
	Low and medium-low technology	Medium-high technology	High technology
Joint meetings	3.70	3.76	<b>3.92</b>
Cooperation between departments	3.87	4.04	<b>4.26</b>
Managers and employees	3.86	3.76	<b>3.97</b>
Team operation	3.65	<b>3.88</b>	3.79
Dissemination of best practices of other companies	3.00	3.05	<b>3.26</b>
Continuous improvement of transfer of information and knowledge	3.69	<b>3.81</b>	3.71
Obtaining the information needed	3.65	3.76	<b>4.00</b>

Analysis of the detailed factors comprising the indicators provides some interesting conclusions (Table 6). Above all, of interest is more frequent introduction of teamwork in medium-high tech entities than in high technology companies. This may mean that in the case of high technology, individual work is as important as teamwork. Another surprising element is the relatively low level of efforts for continuous improvement of transfer of information and knowledge among entities producing high technology products. It should be emphasized that the results may also be due to far fewer companies surveyed qualified as high-tech (38), and a much larger number of medium-high (114) and other enterprises (179) (Table 2).

In the context of the transfer of knowledge, the size of the entity is of great importance. Accordingly, the intensity of the issues discussed depending on the number of employees in the companies is summarized in Tables 7 and 8.

Table 7. Values of indicators for the transfer of knowledge in manufacturing companies, depending on the number of employees in the company

Group of questions	Number of employees			
	Fewer than 10 employees	10–49 employees	50–249 employees	250 employees and above
Cooperation in the enterprise	3.72	3.85	<b>3.87</b>	3.78
Continuous development	3.38	3.36	3.38	<b>3.56</b>
Subjective assessment of effectiveness of transfer of information and knowledge	3.61	3.75	<b>3.79</b>	3.65

As shown in Table 7, cooperation in small and medium-sized entities is at a comparable level (3.85 and 3.87). The same can be said about the value of subjective assessment of effectiveness of the transfer of information and knowledge (3.75 and 3.79). Despite that, large companies definitely stand out in terms of efforts related to the streamlining of processes in this area. The “continuous development” index is practically at the same level in all types of companies except the largest organizations, among which it is noticeably higher. Put together, among all three analysed indicators transfer of information and knowledge, is most effective in small and medium-sized enterprises. This issue, however, is further analysed in Table 8.

Table 8. Answers to individual questions in the surveyed enterprises, depending on the number of employees in the company

Question	Number of employees			
	Fewer than 10 employees	10–49 employees	50–249 employees	250 employees and above
Joint meetings	3.40	3.76	<b>3.93</b>	3.74
Cooperation between departments	3.84	3.95	4.04	<b>4.09</b>
Managers and employees	<b>3.98</b>	3.90	3.80	3.47
Team operation	3.67	3.78	3.72	<b>3.82</b>
Dissemination of best practices of other companies	2.95	3.05	3.01	<b>3.32</b>
Continuous improvement of transfer of information and knowledge	<b>3.81</b>	3.67	3.76	3.79
Obtaining the information needed	3.61	3.75	<b>3.79</b>	3.65

Table 8 demonstrates an interesting situation regarding the indicator “cooperation in the enterprise”. The intensity of the meetings is the highest among

medium-sized companies (50–249 employees). In the case of small (10–49 employees) and large companies, it is much lower, and in micro-enterprises (fewer than 10 employees) the lowest. These entities probably do not pay attention to this issue due to the small number of employees, or even the fact that a considerable number of these types of entities are sole proprietorships. Cooperation between departments is more intensive in larger companies, which is probably associated with the existing procedures. A very interesting issue is the intensity of cooperation of managers with employees – the larger the enterprise the less action there is in this regard. This is probably due to the difficulties associated with the company size. In turn, the team work is most intensive among the largest entities.

An interesting aspect is the fact that the largest companies by far excel in disseminating best practices of other companies. Meanwhile, in the context of streamlining the measures regarding the movement of information and knowledge, there are no major differences between the studied entities except for small businesses.

Numerous aspects demonstrate that small and medium enterprises deal best with knowledge transfer. This is probably the optimal size for a company in terms of transfer of intangible assets. Micro-enterprises probably do not put much emphasis on this issue, and for large enterprises, their size is a rather large barrier to increasing the effectiveness of this kind of efforts.

The analyses presented in the article so far have demonstrated the level of the various elements of the issue of transfer of knowledge, regardless of the scope of activity of manufacturing companies. The subsequent analyses will highlight the companies operating locally and those in the process of internationalisation in order to learn the correlation between the internationalisation process and transfer of information and knowledge. The first relatively general analysis of this type is presented in Table 9.

Table 9. Values of indicators for the transfer of knowledge in manufacturing companies, depending on the scope of activity

Group of questions	Scope of activity	
	Enterprises operating locally	Enterprises in internationalisation process
Cooperation in the enterprise	3.77	<b>3.84</b>
Continuous development	3.30	<b>3.42</b>
Subjective assessment of effectiveness of transfer of information and knowledge	3.68	<b>3.75</b>

Table 9 indicates that all the studied indicators have a higher value among companies in the internationalisation process. Despite the same direction of differences, it should be noted that they are not large. Detailed analysis in this scope is shown in Table 10.

Table 10. Answers to individual questions in the surveyed enterprises, depending on the scope of activity

Question	Scope of activity	
	Enterprises operating locally	Enterprises in internationalisation process
Joint meetings	<b>3.76</b>	3.75
Cooperation between departments	3.88	<b>4.00</b>
Managers and employees	<b>3.89</b>	3.83
Team operation	3.56	<b>3.80</b>
Dissemination of best practices of other companies	2.99	<b>3.07</b>
Continuous improvement of transfer of information and knowledge	3.61	<b>3.77</b>
Obtaining the information needed	3.68	<b>3.75</b>

As shown in Table 10, among the detailed elements of the indicators, almost all of them are higher for enterprises in the internationalisation process. The exceptions are joint meetings and intensity of contact between managers and employees. It is understandable, however, as a company's commitment to the internationalisation process in many cases means the geographical dispersion of the entity, which hinders the implementation of such efforts.

The size of an entity is also an important element in the context of the transfer of knowledge. Tables 11a and 11b present the individual elements of this issue in enterprises of varying employment scale, operating locally and in the internationalisation process.

Table 11a. Values of indicators for the transfer of knowledge in manufacturing companies, depending on the number of employees in the company and the scope of activity – part A

Group of questions	Fewer than 10 employees		10–49 employees	
	Enterprises operating locally	Enterprises in internationalisation process	Enterprises operating locally	Enterprises in internationalisation process
Cooperation	<b>3.80</b>	3.66	3.78	<b>3.88</b>
Continuous development	<b>3.54</b>	3.24	3.17	<b>3.44</b>
Efficiency	<b>3.69</b>	3.55	3.69	<b>3.78</b>

Table 11b. Values of indicators for the transfer of knowledge in manufacturing companies, depending on the number of employees in the company and the scope of activity – part B

Group of questions	50–249 employees		250 employees and above	
	Enterprises operating locally	Enterprises in internationalisation process	Enterprises operating locally	Enterprises in internationalisation process
Cooperation	3.61	<b>3.89</b>	N/A	3.78
Continuous development	3.14	<b>3.40</b>	N/A	3.56
Efficiency	3.57	<b>3.81</b>	N/A	3.65

The first interesting conclusion arising from Table 11a is the fact that among micro-enterprises (employing up to 10 employees), companies operating locally demonstrate higher intensity of knowledge transfer. Moreover, in some cases the differences in the ratios between those entities and entities of the same size, but undergoing the internationalisation process are quite remarkable. For small (10–49 employees) and medium-sized enterprises (50–249 employees), the situation is reversed – companies in the internationalisation process are doing better – the values of all the analysed indicators are higher than their value for similar entities operating locally (Tables 11a and 11b).

These results indicate that micro-enterprises in the internationalisation process cope much less with the transfer of information and knowledge than larger companies, and internationalisation is more challenging for them. It can even weaken them somewhat, and in the case of larger companies, the effect is the opposite. Another interesting fact arising from Table 11b is a relatively low level of the tested indicators among medium-sized companies (employing 50–249 employees) operating only locally. It should be noted, however, that our sample included relatively few such entities. The fact that a company of this size, does not operate on foreign markets even to a small degree may indicate its general management problems. Therefore, in the future, the number of these entities will decrease.

It should be noted that in the case of large companies (employing 250 workers or more) the sample did not identify the entities not undergoing the internationalisation process (Table 11b).

For further, detailed analysis of the issue of knowledge transfer among companies of various sizes in terms of employment, operating locally and in the internationalisation process, the values of individual elements of the indicators in Tables 11a and 11b are shown in Tables 12a and 12b.

Table 12a. Answers to individual questions in the surveyed enterprises, depending on the number of employees in the company and the scope of activity – part A

Question	Fewer than 10 employees		10–49 employees	
	Enterprises operating locally	Enterprises in internationalisation process	Enterprises operating locally	Enterprises in internationalisation process
Joint meetings	<b>3.65</b>	3.19	<b>3.85</b>	3.72
Cooperation between departments	<b>3.88</b>	3.81	3.87	<b>3.99</b>
Managers and employees	<b>4.12</b>	3.87	3.82	<b>3.94</b>
Team operation	3.54	<b>3.77</b>	3.59	<b>3.86</b>
Dissemination of best practices of other companies	<b>3.04</b>	2.87	2.97	<b>3.09</b>
Continuous improvement of transfer of information and knowledge	<b>4.04</b>	3.61	3.36	<b>3.80</b>
Obtaining the information needed	<b>3.69</b>	3.55	3.69	<b>3.78</b>

Table 12b. Answers to individual questions in the surveyed enterprises, depending on the number of employees in the company and the scope of activity – part B

Question	50–249 employees		250 employees and above	
	Enterprises operating locally	Enterprises in internationalisation process	Enterprises operating locally	Enterprises in internationalisation process
Joint meetings	3.71	<b>3.94</b>	N/A	3.74
Cooperation between departments	3.86	<b>4.05</b>	N/A	4.09
Managers and employees	3.43	<b>3.83</b>	N/A	3.47
Team operation	3.43	<b>3.74</b>	N/A	3.82
Dissemination of best practices of other companies	2.86	<b>3.02</b>	N/A	3.32
Continuous improvement of transfer of information and knowledge	3.43	<b>3.78</b>	N/A	3.79
Obtaining the information needed	3.57	<b>3.81</b>	N/A	3.65

The specific factors, which comprise the three previously described indicators of information and knowledge transfer, are presented in Tables 12a and 12b. The directions of differences between entities operating locally and in the internationalisation process among companies of a given size are similar in most situations as for the indicators, which they comprise. The only exceptions are joint meetings in small enterprises (10–49 employees) and team work in micro-enterprises (fewer than 10 employees). In the first case, it is probably due to geographic dispersion, which often implies a process of internationalisation. This situation, along with the limited resources among such enterprises enforces lower intensity of meetings. In the second case, concerning the team work in micro-enterprises, the results indicate that this manner of working is often used by companies in the internationalisation process – none of the analysed groups of companies operating in foreign markets demonstrated this factor below 3.70.

Another complex analysis is a combination of the two criteria for the division of companies – the level of technology and the scale of local and international operation of entities. In this case, the level of technology distinguishes two groups of companies: “low and medium-low technology” and “high and medium-high technology.” The results of analyses are presented in Tables 13 and 14.

The most interesting and surprising result of the above analysis of indicators (Table 13) is the fact that in the case of companies manufacturing high and medium-high technology products in the process of internationalisation, the value of all the indicators tested is higher than for this type of entities operating locally. In the case of companies manufacturing low and medium-low technology products the situation is reverse – companies in the internationalisation process show higher values of the analysed indicators than the same type of entities, but operating locally. Furthermore, these differences are relatively large in almost all cases. The

described direction of the differences raises no doubts, since it is visible for all three indicators. Therefore, the values of the constituent factors of the indicators applied warrant a closer look. They are presented in Table 14.

Table 13. Values of indicators for the transfer of knowledge in manufacturing companies, depending on the level of technology of its products and the scope of activity

Group of questions	Low and medium-low technology		High and medium-high technology	
	Enterprises operating locally	Enterprises in internationalisation process	Enterprises operating locally	Enterprises in internationalisation process
Cooperation in the enterprise	3.70	<b>3.94</b>	<b>3.91</b>	3.89
Continuous development	3.15	<b>3.48</b>	<b>3.60</b>	3.41
Subjective assessment of effectiveness of transfer of information and knowledge	3.52	<b>3.90</b>	<b>4.00</b>	3.79

Table 14. Answers to individual questions in the surveyed enterprises, depending on the level of technology of its products and the scope of activity

Question	Low and medium-low technology		High and medium-high technology	
	Enterprises operating locally	Enterprises in internationalisation process	Enterprises operating locally	Enterprises in internationalisation process
Joint meetings	<b>3.73</b>	3.65	<b>3.83</b>	3.80
Cooperation between departments	3.71	<b>3.97</b>	<b>4.21</b>	4.08
Managers and employees	3.88	<b>4.06</b>	<b>3.92</b>	3.80
Team operation	3.50	<b>4.06</b>	3.67	<b>3.89</b>
Dissemination of best practices of other companies	2.77	<b>3.19</b>	<b>3.42</b>	3.05
Continuous improvement of transfer of information and knowledge	3.52	<b>3.77</b>	<b>3.79</b>	3.78
Obtaining the information needed	3.52	<b>3.90</b>	<b>4.00</b>	3.79

As shown in Table 14, similarly to the analysis of employment, the directions of differences between the entities operating locally and those in the internationalisation process among companies manufacturing products of a given technology are similar in majority of factors as in the case of indicators, which they comprise. Lower intensity of meetings among companies in the internationalisation process is probably related to the difficulties associated with frequent geographical dispersion. It should be noted, however, that the difference in this respect among the enterprises producing high technology products is not large, and the values are



relatively high. An interesting aspect is the high level of team work operation among high and medium-high technology enterprises operating in foreign markets. It is higher than in this type of entities operating in local markets, despite the fact that all other factors related to the transfer of knowledge in this type of entities in the process of internationalisation are at a lower level.

The results are probably associated with a number of effects – the first concerns the higher level of overall knowledge management, which the studied transfer is part of, among enterprises in the process of internationalisation [Soniewicki 2015]. This article, however, analyses a specific type of companies – manufacturing companies. Moreover, transfer is a specific issue of knowledge management. The process of internationalisation and frequent associated geographical spread of an entity and its employees hinders activity in this respect. The results show that internationalisation is a particular challenge for entities manufacturing high and medium-high technology products. Operation of companies in many markets may be associated with adapting products to local requirements which is certainly a more complex process for enterprises manufacturing high and medium-high technology products than in those producing low and medium-low technology products. In the case of latter, adaptation processes are likely to be less intensive and less sensitive to the difficulties related to internationalisation. Furthermore, they are not likely to require such large and intensive transfer of complex knowledge, which may explain the answers to the question of efficiency in obtaining information needed by employees and management. The described issue should certainly be studied further, e.g. using qualitative research, which in this case could further clarify the results.

## Conclusions

The results of empirical analyses presented in this article are the source of a number of interesting conclusions regarding the operations of different kinds of manufacturing enterprises in terms of transfer of information and knowledge. The first is the fact that the most intensive processes in the studied scope include the entities producing high technology products, but in some specific aspects, higher intensity of activities characterises the enterprises producing medium-high technology products. In terms of size of companies, the most intensive activity in the examined scope can be seen in the small and medium-sized enterprises.

The key conclusions of the article, however, concern issues related to the process of internationalisation. The results of the analyses showed that the manufacturing companies operating in foreign markets generally demonstrate higher intensity of processes for the transfer of information and knowledge. Nevertheless, the most important and interesting findings come from the last tables in the article: 11a and

b, 12a and b, 13 and 14. They show that most types of manufacturing companies in the internationalisation process are characterized by a higher intensity of activities in terms of information and knowledge compared to similar companies operating only locally. However, there are exceptions, which include two types of entities. The first are companies with fewer than 10 employees. In their case, one might suspect that the process of internationalisation significantly worsens the intensity of information and knowledge transfer due to very limited resources held by these entities. A very similar situation can be observed among companies producing high and medium-high technology products. In this case, the most likely cause of this phenomenon is a problem in the transfer of very complex knowledge at long geographical distances and adjustment of complex products to local requirements, which is usually a very difficult task for complex products, requiring a lot of effort and experience.

The research has certain limitations. The first is the fact that the analysed companies were selected from the Kompas Poland database. It is a large, nationwide database, but it does not include all companies operating in Poland. Another aspect affecting the results may also be a relatively small number of surveyed companies producing high technology products.

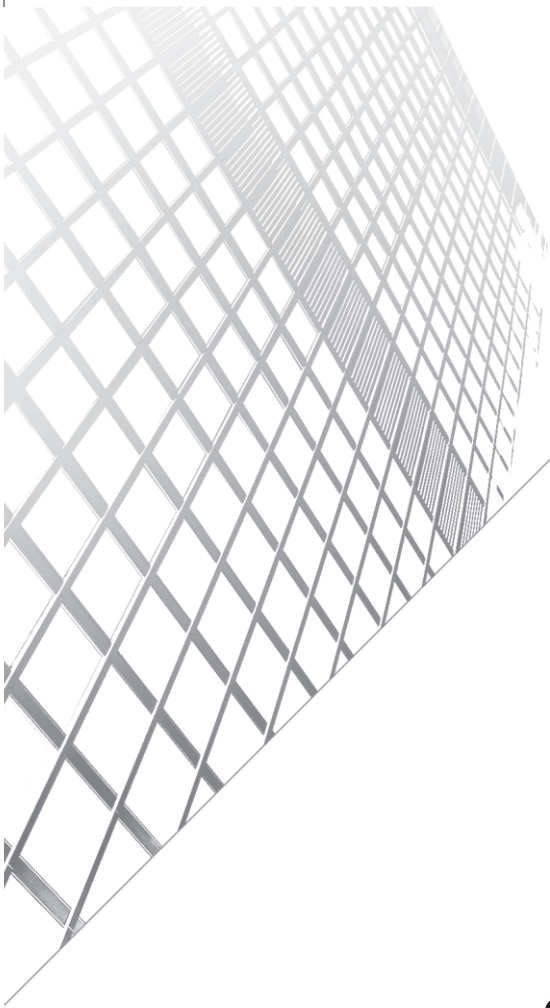
The issues tackled in this article, in particular those related to the impact of the internationalisation process on the intensity, nature and quality of information and knowledge transfer in a specific types of manufacturing enterprises should be studied further. This applies particularly to companies producing high technology products, as well as micro-enterprises (employing fewer than 10 people). It would be particularly interesting to conduct a qualitative study. This would enable learning the causes of the differences in the intensity of the processes studied in the article.

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# Contemporary Financial Issues



Wiesław Łuczyński<sup>1</sup>

## Forecasting the dynamics of stock indices (DJIA, DAX and WIG) using conditional models (1992–2014)

### Introduction

Defining conditional expectation of the progress of data generating random processes, whose conditional variance is constant over time is reduced to the problem of prediction of mean square error [see: Athreya and Lahiri 2006; Kosiorowski 2012a]. The regression analysis for random variables  $(X, Y)$  is the prediction of  $Y$  based on the observation of  $X$ . It is therefore necessary to find a function  $f$  such that  $Y = f(X)$ . As a criterion which is a measure of the accuracy of the estimate of  $Y$  mean square error is usually adopted. Assuming that the expected value of  $Y$  prediction is finite proves the existence of the function  $f_0$  minimizing the mean square error of prediction [Athreya and Lahiri 2006].

The recognition appears *prima facie* justified that volatility of economic dynamics of time series over long periods of time increases the unconditional mean square errors of their prediction. The series of economic dynamics are not however generated by random processes only. If that were the case, any attempt at prediction would be futile, since random processes cannot be predicted. This does not mean that a properly applied “reception strategy” may recognise a meaningless “random” error as “significant” and “structured”. In this case, the organization of communication imposed by reception strategy is formed, “only “on the side” of recipient who is somehow subject to “information” hallucination” [Lem 2010, p. 269]. Economic processes are not random isolates, these processes are interrelated by various relationships (causal, probabilistic, fuzzy, feedback, etc.). Moreover, it appears that the efficiency of the prediction depends to some extent on the procedures used to “prewhiten” data.

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The size of mean square prediction error may also be affected by the occurrence in the studied time series of data outliers. Such data can occur in different time series. One may also treat the whole series as data outlier in the set (family) of time series [Lopez-Pintado and Romo 2006; 2009]. Their impact on the results of regression analysis depends largely on the applied calculation procedures. In order to remove the influence of the outliers on the results, these data are often removed from the time series. Also, corrective procedures are used (averaging, filtering, etc.) for the outliers. Under the conditions of the processes that generate a large percentage of outliers in all the observations in the period considered, such interference with a high probability can lead to apparent regression. Therefore, the literature highlights the use of resistant statistical procedures in economic research to minimize mean square errors [see: Brandt 1999; Chow 1995; Chukwu 2003; DeLurgio 1998; Edgeworth 1888; Gruszczyński i Podgórska 2003; Greene 2000; Jajuga 1993; Kosiorowski 2012; Maddala 2006; Walesiak and Gantar 2009; Studenmund 2001].

The aim of these studies of the dynamics of stock indices is to verify the hypotheses that the variance and outliers significantly change the mean square errors of forecasting dynamics of economic data of time series.

## 1. Research methods

In the initial “pre-whitening” of monthly data (270 data over April 1992 – September 2014, calculated as month to the same month of the previous year of time series of stock indices DJIA (Dow Jones Industrial Average), DAX (Deutscher Aktienindex) and WIG (Warsaw Stock Exchange Index) – in order to remove the seasonal component from original data, a procedure X-12-ARIMA in the programme *gretl* 1.10.2 (MS Windows x86\_64) was applied. From the available options in the menu **Variable/Analysis X-12 ARIMA** “outlier detection and correction” and automatic transformation were selected. This resulted in a seasonally adjusted component (name\_s). Seasonally adjusted time series were subsequently subjected to extended Dickey-Fuller unit root test in *gretl*. The testing showed no evidence to reject the null hypothesis “there is a unit root” for all seasonally adjusted time series. To remove stochastic trend from the data Hodrick-Prescott filter was applied in *gretl* (lambda for monthly data = 14400). The resulting cyclical component was recorded as hp\_name\_s. Seasonally adjusted data were subject to TRAMO/SEATS analysis in *gretl*. From the available options in the menu **Variable/Analysis TRAMO / SEATS** the following were selected: in general “time series model,” in results “save to database: linearized series,” in outliers “detection and



correction of outliers “, “critical value for outliers: automatically” in transformations “automatically” and “correction by mean” in ARIMA “automatically”. The result was adjusted data name\_s\_xl and outliers IO (innovation process depending on the model generating a series, *innovational outliers*), AO (process adding the outliers, *additive outliers*), LS (the process of moving away from the level, local shifts, *level shift*) and TC (the process of short-term changes, *temporary changes*) [see: Maronna, Martin and Yohai 2006].

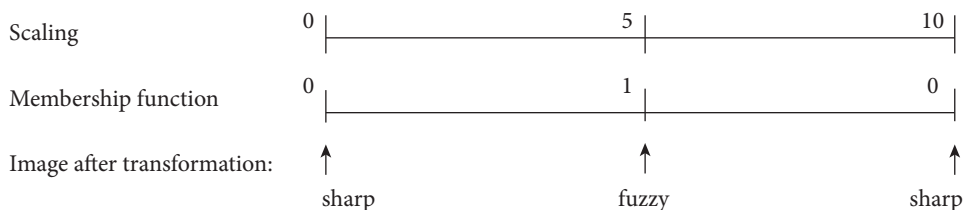
For statistical stationarity (slow variability) of economic series one can apply the procedure for pre-whitening the data. It involves the use of membership function defining on the elements for time series – the time-ordered fuzzy set [Chanas 1988; Czongala and Pedrycz 1985; Jajuga 1984; Kacprzyk 1983; 1986; Kacprzyk and Fedrizzi 1991; Ponsard 1992; Wołoszyn 1990; Ostasiewicz 1986; Łuczyński 1998]:

1. After scaling source data of time series  $x_i$  we get a series

$$Z_i = \forall (i = 1, 2, \dots, n) \frac{10x_i}{x_{max}}, \text{ to which we apply the membership function:}$$

2.  $f : \{Z_i\} \rightarrow [0, 1], f(Z_i) = 1 - |1 - 0.2Z_i|$ .

Transformation of time series can be illustrated graphically:



The result is time series of stock indices wig\_s\_r, djia\_s\_r and dax\_s\_r

For the thus obtained time series, ARMA forecasting model was used (in the menu **Model/Models of time series/Model ARIMA** in program *gretl*, assuming the inclusion of only the intercept and the parameter of covariance matrix via Hessian). Relevance of quantitative predictions was evaluated using mean squared error ex-post in verification interval. Interval of empirical verification of forecasts was set for the period February 2014 – October 2014 (eight months) [see: Clements and Hendry 2001; Clements and Hendry 2001; 2004; Chatfield 2000]. For all the data (name\_s, name\_s\_r, hp\_name\_s, name\_s\_xl) non-seasonal and seasonal series of AR, differentiation and MA were used (p, d, q) (P, D, Q) set automatically in the procedure TRAMO/SEATS in *gretl*. Then, for each data set (adjusted for seasonal fluctuations, fuzzy, Hodrick-Prescott stochastic trend removed and linearized ranks) growth forecasts were established with the

help of ARIMA models using an appropriate and conditional maximum likelihood method<sup>2</sup>. Mean prediction error ME, mean square error MSE, root mean square error RMSE, mean absolute error MAE, mean percentage error MPE, mean absolute percentage error MAPE, the Theil coefficient (percent) I, share of prediction biasedness  $I1^2/I^2$ , share of insufficient flexibility  $I2^2/I^2$ , share of non-compliance of direction  $I3^2/I^2$  of the forecast ex-post in verification period 02–10/ 2014 were calculated. For all the time series, standard deviations were calculated (in the context menu *View/Descriptive statistics* in gretl [Kufel 2007], see: Table 2 in Statistical annex).

The study examined the following time series of the German economy (period = P, D = the number of data; the data are presented as a chain index: month to month of the previous year):

Table 1. Monthly time series of stock indices DJIA, DAX and WIG (April 1992 – September 2014)

No.	Time series	P	D	Symbol
1	Stock index DJIA	1992–2014	270	dja
2	Stock index DAX	1992–2014	270	dax
3	Stock index WIG	1992–2014	270	wig

The data were obtained from the archives of the foreign exchange indexes available on at [www.money.pl](http://www.money.pl) (23 October 2015).

## 2. Empirical research

Timing of monthly time series of stock indices DJIA, DAX and WIG show high similarity (correlation coefficients for transformed series DJIA: 0.7593–0.9753; DAX: 0.7762–0.9268; WIG: 0.4018–0.8808, see Table 1 Statistical Annex).

The standard deviations of time series with Hodrick-Prescott stochastic trend removed are smaller than the standard deviation of data after the procedure X-12 ARIMA. Meanwhile, the standard deviations of the time series obtained in the analysis TRAMO/SEATS are smaller than the seasonality removed data, and in relation to the data after filtration with Hodrick-Prescott filter, it applies only to WIG. After the data fuzzification procedure the standard deviations turned out to be the smallest. The standard deviations of the fuzzy series were greatest for the DJIA, and the lowest for WIG (data used in graphs 4 and 5 are shown in Table A2 in the Statistical annex).

<sup>2</sup> Unconditional maximum likelihood method uses Kalman filter algorithm, and the conditional maximum likelihood method uses BHHH algorithm (E.R. Berndt, B.H. Hall, R.E. Hall, J.A. Hausman [Kufel 2007; Maddala 2006; Berndt et al. 1974]).

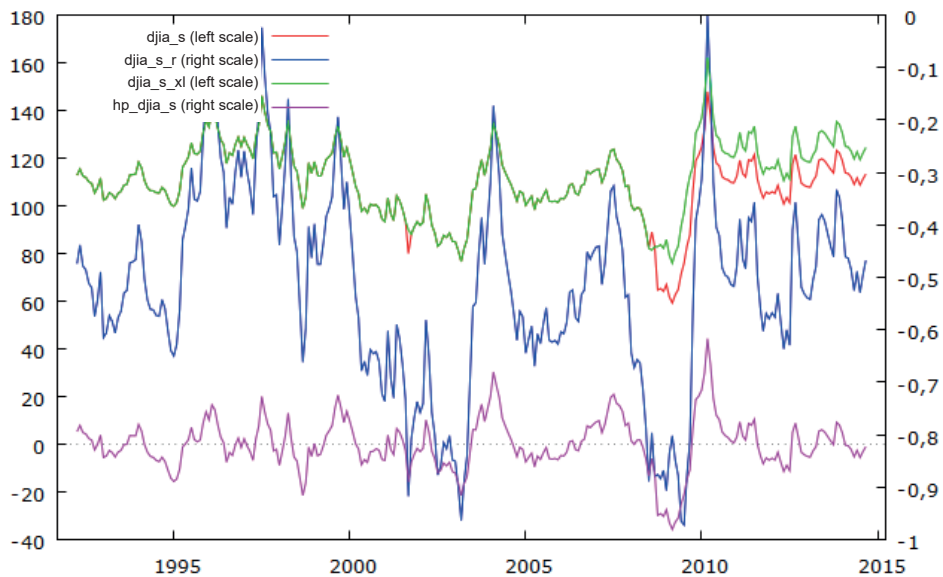


Figure 1. The waveforms of stock index DJIA seasonality adjusted (djia\_s) after applying the Hodrick-Prescott filter (hp\_djia\_s), subjected to the TRAMO/SEATS analysis (djia\_s\_xl) and the use of membership function (djia\_s\_r) (04/1992-09/2014)

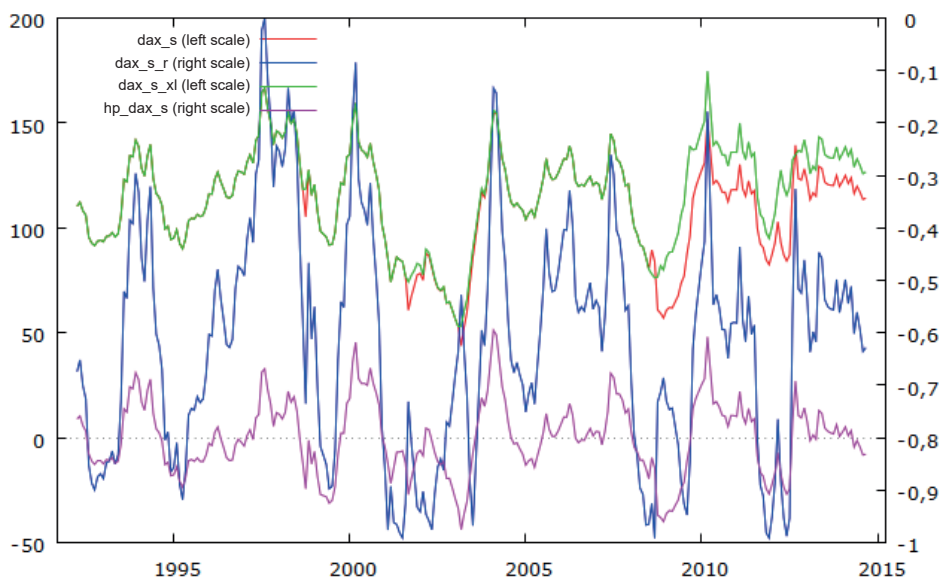


Figure 2. The waveforms of stock index DAX seasonality adjusted (dax\_s) after applying the Hodrick-Prescott filter (hp\_dax\_s), subjected to the TRAMO/SEATS analysis (dax\_s\_xl) and the use of membership function (dax\_s\_r) (04/1992-09/2014)

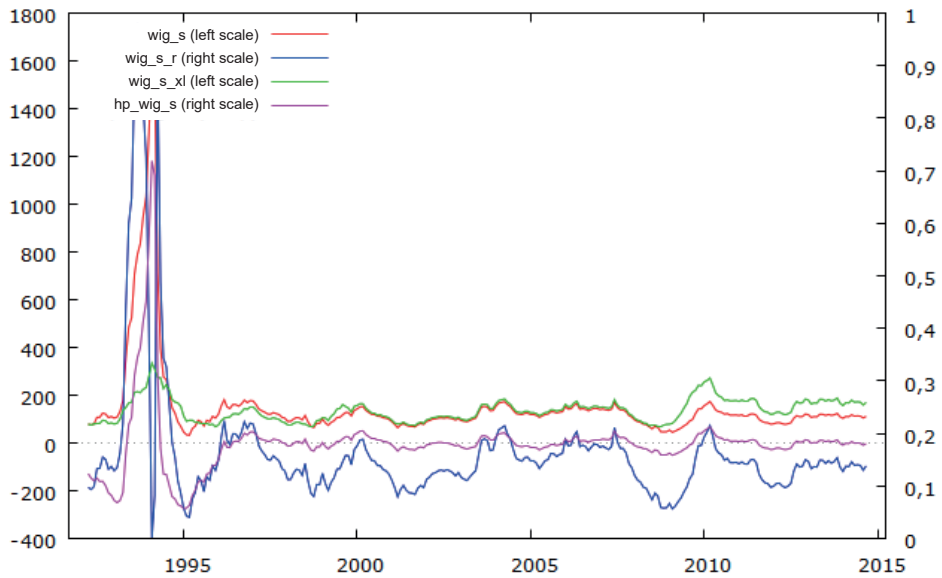


Figure 3. The waveforms of stock index WIG seasonality adjusted (wig\_s) after applying the Hodrick\_Prescott filter (hp\_wig\_s), subjected to the TRAMO/SEATS analysis (wig\_s\_xl) and the use of membership function (wig\_s\_r) (04/1992-09/2014)

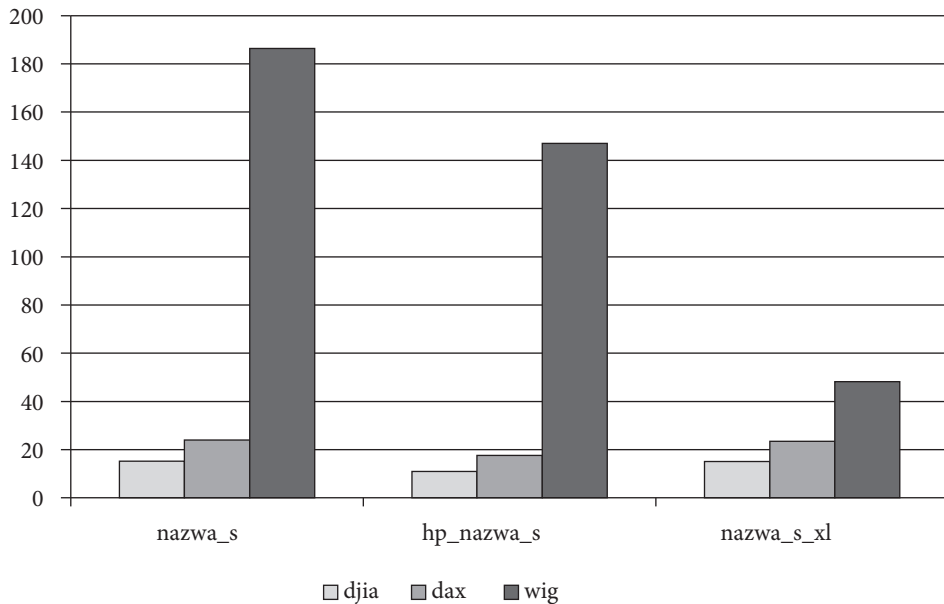


Figure 4. Standard deviations of time series seasonality adjusted (name\_s) after applying the Hodrick\_Prescott filter (hp\_name\_s), subjected to the TRAMO/SEATS analysis (name\_s\_xl) (04/1992-09/2014)

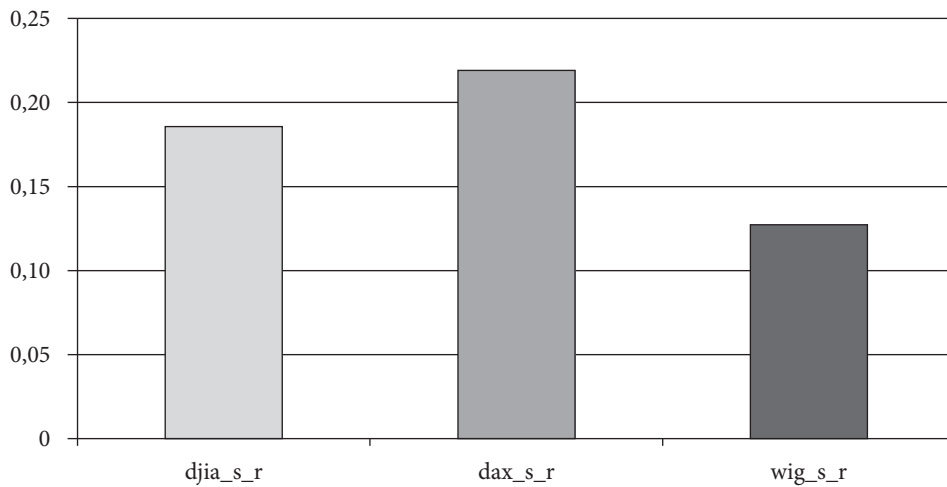


Figure 5. Standard deviations of time series for fuzzy series (name\_s\_r) (04/1992–09/2014)

The level of standard deviations of time series does not seem to be strongly associated with the presence of outliers in these series. So, for example, with the decrease in the variance of the dynamics of stock indices DJIA, DAX and WIG (the transition from the series with the seasonality removed to the series after applying the Hodrick-Prescott filter), there occurred a change in the share of outliers AO (by – 40%, 0% and – 17%), IO (by – 15%, + 12.5% and + 2%), LS (by + 9%, + 25% and + 11%) and TC (by + 45%, 37.5% and 3%, respectively) (see Table 2 and 3 in Statistical annex). For the fuzzy data the reversal of shares of the various types of outliers of the series with the highest (DAX) and the lowest (WIG) variance is significant. The total number of outliers WIG 3.5–4 times exceeded the number of outliers of fuzzy time series of stock indices DJIA and DAX.

Theil index [Clements and Hendry 2001], which allows to evaluate the accuracy (error) of forecasts ex post, calculated for a range of verification (02–09/2014) of the series of dynamics of stock market indices after removal of the seasonal component (X-12 ARIMA), fuzzification, use of the HP filter and linearization showed relatively smaller errors (outside hp\_wig\_s and – to a lesser extent – dax\_s\_xl) for forecasts obtained using the conditional maximum likelihood method of model ARMA [Cieślak 2001] compared to forecasts with the unconditional maximum likelihood method. The lowest forecast errors were obtained for dax\_s data (conditional maximum likelihood method), the largest for hp\_djia\_s data (unconditional maximum likelihood method). Also noteworthy is the diversity of distribution of Theil index for WIG forecast compared with forecasts for DAX and DJIA (Fig. 7). This may indicate the effectiveness of the procedure of fuzzification of the projected time series with large amount of outliers (especially type IO outliers).

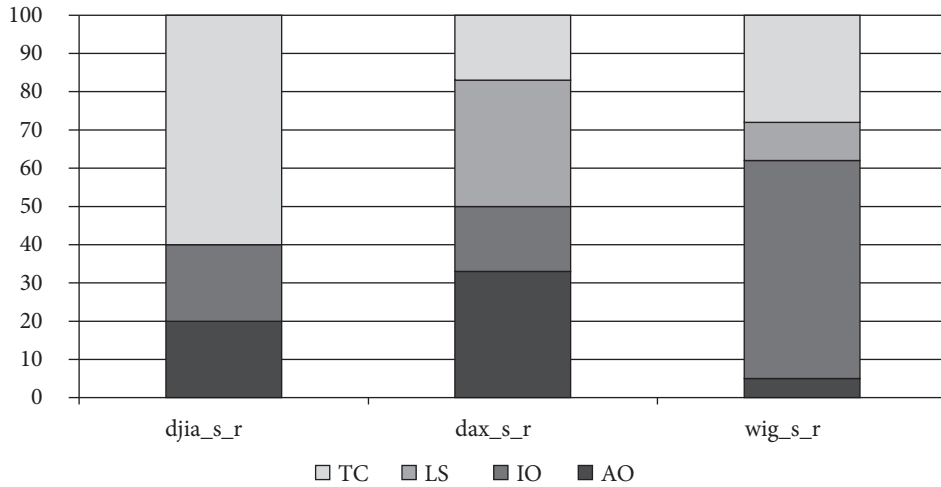


Figure 6. Shares of outliers (AO, IO, LS, TC) for fuzzy series of stock indices DJIA, DAX and WIG (name\_s\_r) (04/1992–09/2014)

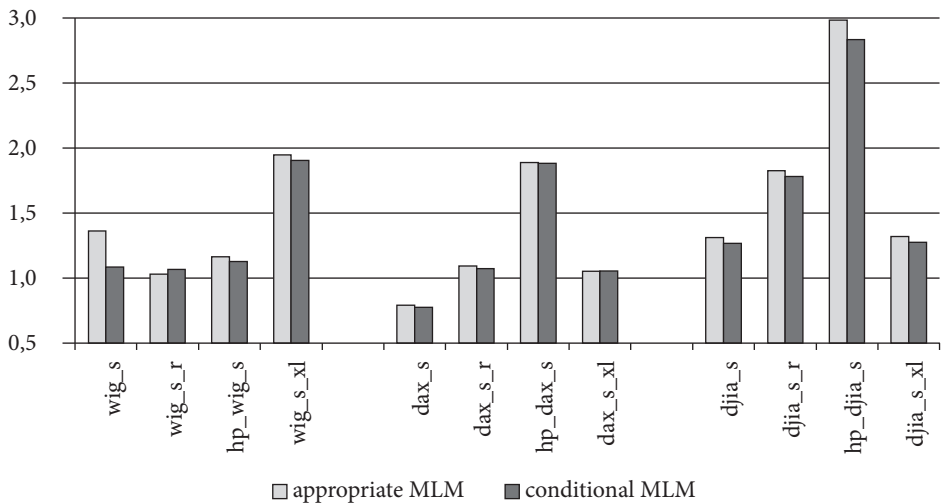
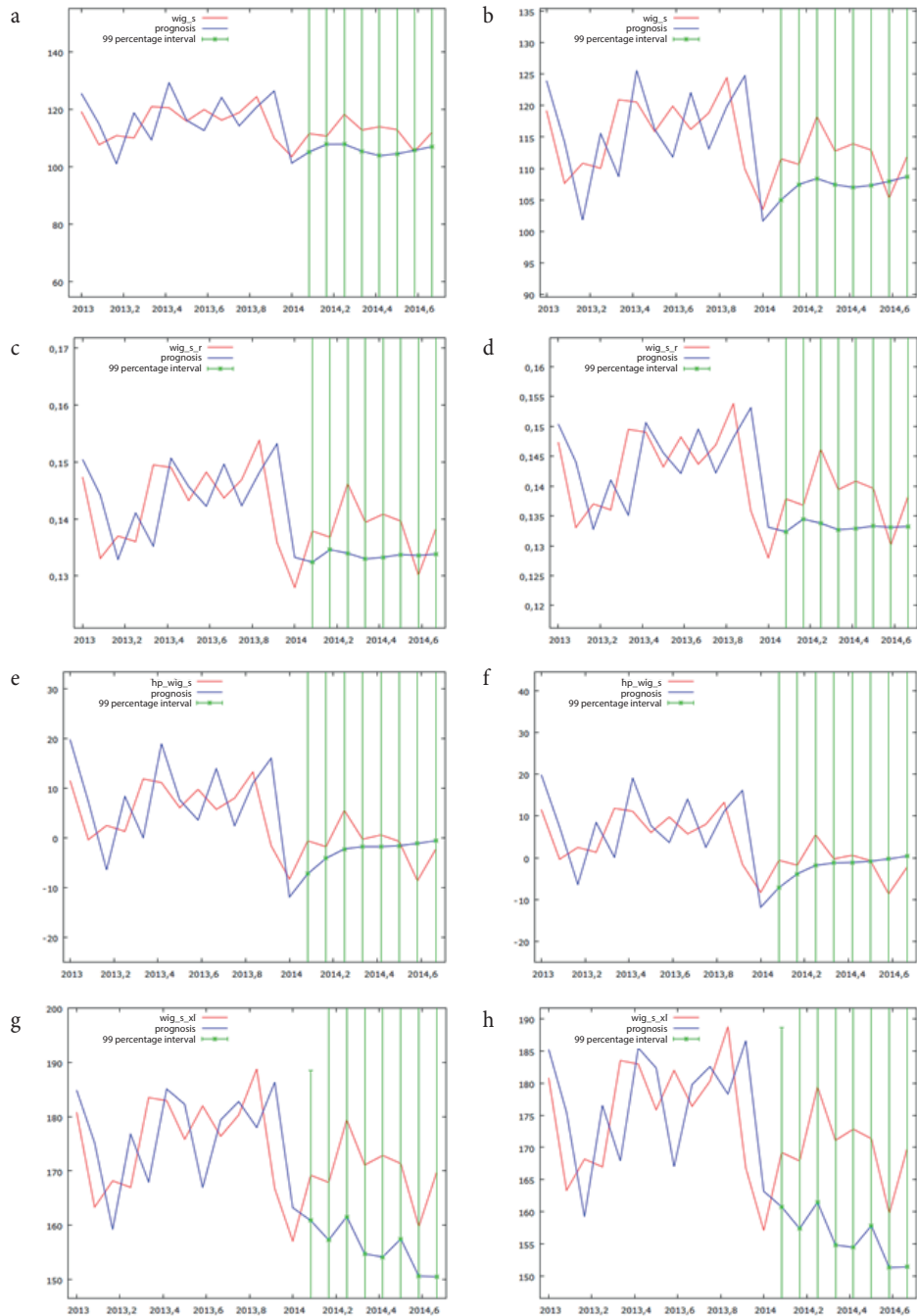


Figure 7. Theil index for ex post forecasts (obtained with correct and conditional maximum likelihood method) in the range of verification (02–09/2014) series of dynamics of stock market indices with seasonality removed (name\_s) after applying the HP filter (hp\_name\_s), linearized (name\_s\_xl) and blurred (name\_s\_r)

Source: own study, see Table 4 Statistical annex

Forecasts obtained using the correct and conditional maximum likelihood method showed no noticeable differences. A greater impact on the accuracy of forecasts was rather in a choice of method for filtering data than the specified maximum likelihood method (Figures 8–10):



**Figure 8.** Dynamic forecast within the range of verification 02-09/2014 of WIG dynamics (wig\_s, wig\_s\_r, hp\_wig\_s, wig\_s\_xl) using the correct (left graph) and conditional (right graph) maximum likelihood method

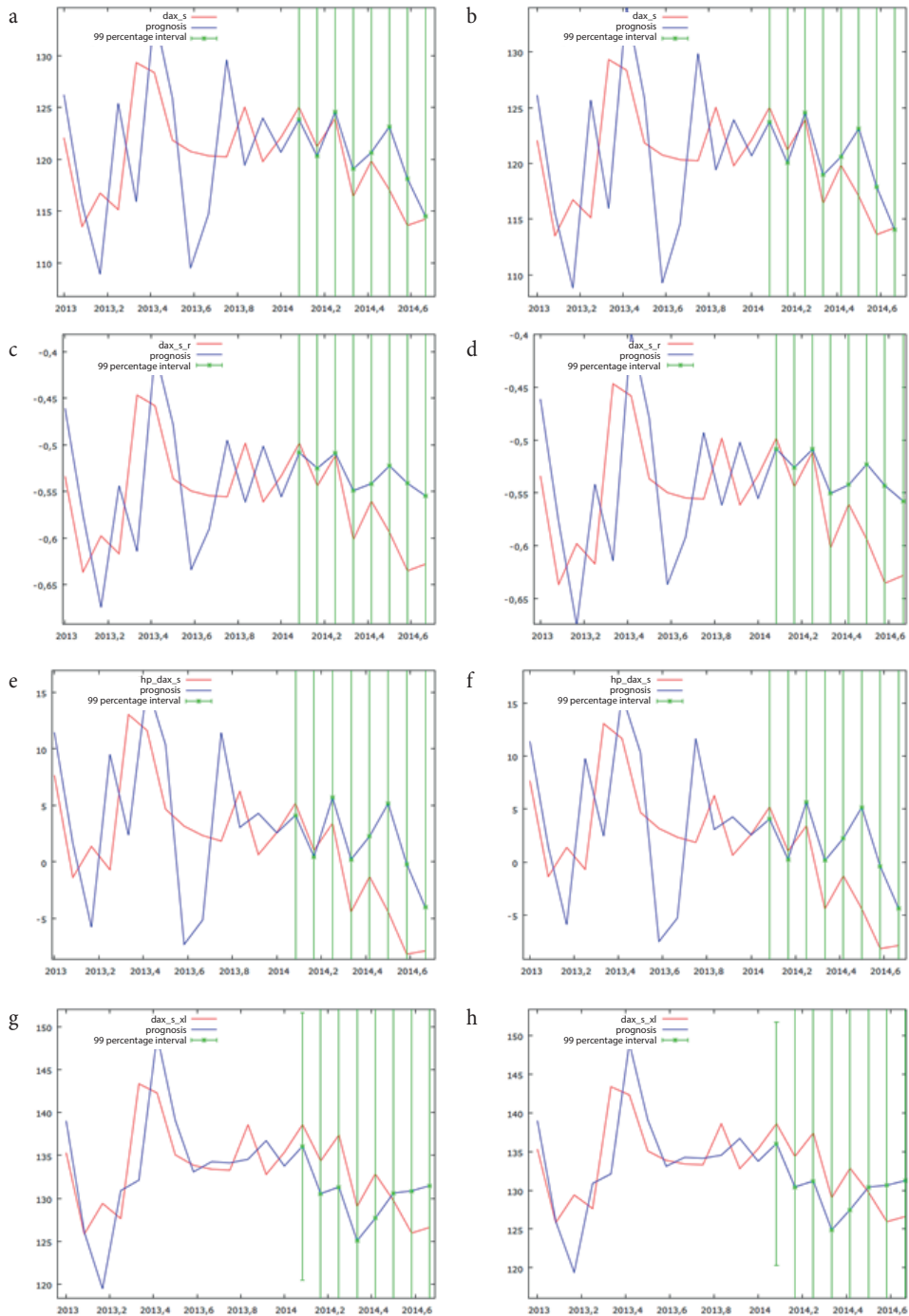


Figure 9. Dynamic forecast within the range of verification 02-09/2014 of DAX dynamics (dax\_s, dax\_s\_r, hp\_dax\_s, dax\_s\_xl) using the correct (left graph) and conditional (right graph) maximum likelihood method



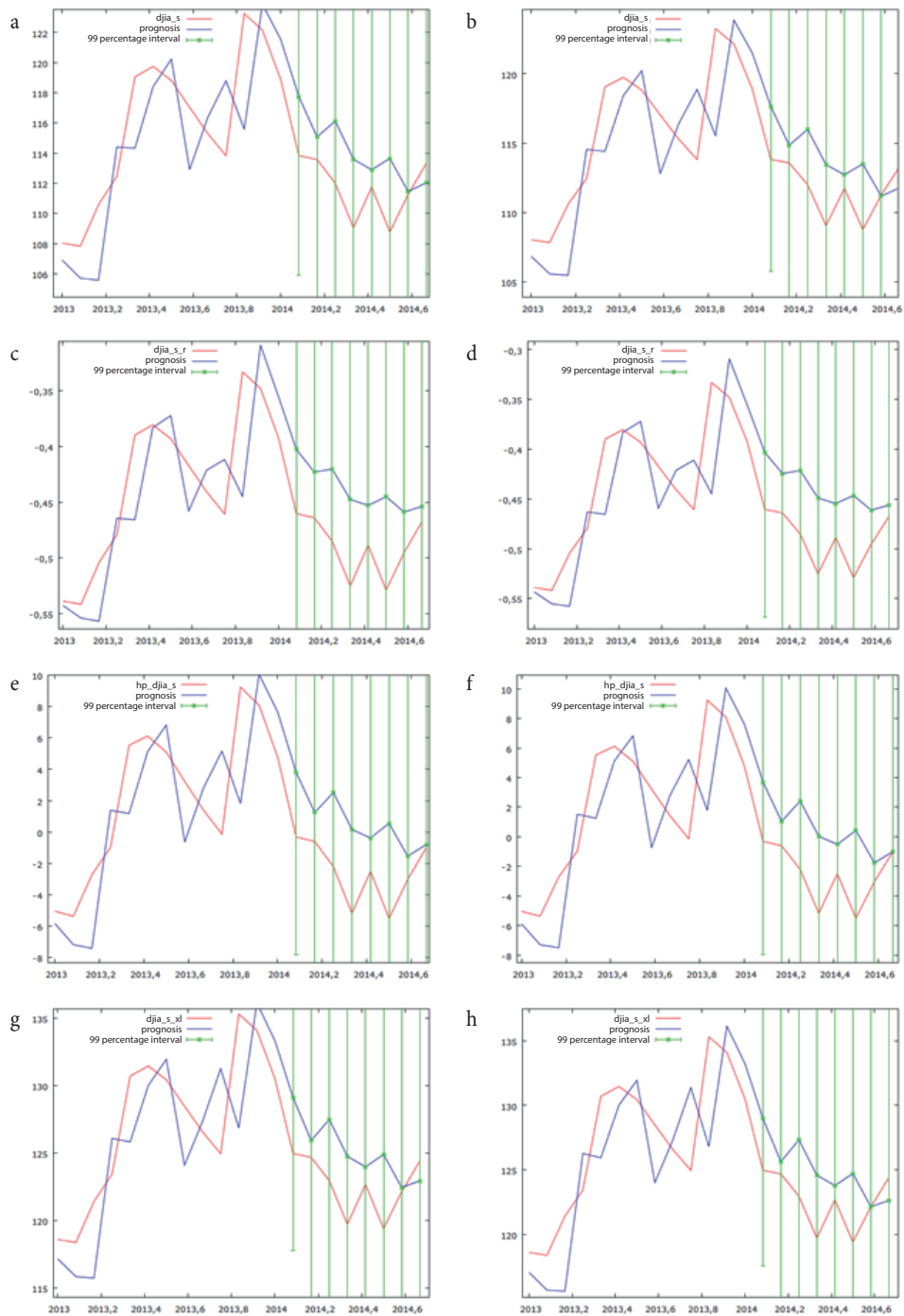


Figure 10. Dynamic forecast within the range of verification 02-09/2014 of DJIA dynamics (djia\_s, djia\_s\_r, hp\_djia\_s, djia\_s\_xl) using the correct (left graph) and conditional (right graph) maximum likelihood method

## Conclusions

The analysis showed relatively minor errors (outside hp\_wig\_s and – to a lesser extent – dax\_s\_xl) for forecasts obtained using the conditional maximum likelihood method of ARMA model compared to forecasts from the unconditional maximum likelihood method. The lowest forecast errors were obtained for dax\_s data (conditional maximum likelihood method), the largest for hp\_djia\_s data (unconditional maximum likelihood method). Also noteworthy is the diversity of distribution of Theil index for WIG forecast compared with forecasts for DAX and DJIA. This may indicate the relatively greater effectiveness of the procedure of fuzzification of the projected time series with large amount of outliers (especially type IO outliers). Due to the lack of major differences in conditional and unconditional forecasting it seems that a choice of method for filtering data had a greater impact on the accuracy of forecasts than the specified maximum likelihood method used in the ARMA procedure.

## Statistical annex

Table A1. Correlation coefficients, used observations 1992:04–2014:09. The critical value (for two-sided 5% critical area) = 0.1194 for  $n = 270$

djia_s	djia_s_r	djia_s_xl	hp_djia_s
1,0000	0,9753	0,9255	0,8233 djia_s
	1,0000	0,9349	0,7846 djia_s_r
		1,0000	0,7593 djia_s_xl
			1,0000 hp_djia_s
dax_s	dax_s_r	dax_s_xl	hp_dax_s
1,0000	0,8604	0,9268	0,8613 dax_s
	1,0000	0,8128	0,7762 dax_s_r
		1,0000	0,8104 dax_s_xl
			1,0000 hp_dax_s
wig_s	wig_s_r	wig_s_xl	hp_wig_s
1,0000	0,6010	0,5812	0,8808 wig_s
	1,0000	0,4606	0,4018 wig_s_r
		1,0000	0,5570 wig_s_xl
			1,0000 hp_wig_s

Table A2. Descriptive statistics 04/1992–09/2014 ( $n = 270$ )

Variable	Mean	Median	Minimum	Maximum
wig_s	150.452	115.590	33.0859	1,618.09
dax_s	111.021	116.343	43.9276	166.526
djia_s	108.944	109.482	59.2776	147.873
wig_s_r	0.163677	0.142235	0.000000	0.975686
djia_s_r	-0.518076	-0.519238	-0.971946	0.000000
dax_s_r	-0.618258	-0.602116	-0.991516	0.000000
wig_s_xl	137.123	130.530	68.8012	334.667
dax_s_xl	116.253	120.231	52.9944	174.684
djia_s_xl	112.299	113.436	75.9376	162.340
hp_wig_s	3,25797e-013	-0.318955	-272.746	1,182.05
hp_dax_s	2,24058e-013	-0.509894	-43.8007	51.2133
hp_djia_s	1,25529e-013	-0.662050	-35.6578	44.3092
Variable	Standard deviation	Variation coefficient	Skewness	Kurtosis
wig_s	186.448	1.23925	5.54575	33.7445
dax_s	23.9472	0.215699	-0.422700	-0.198304
djia_s	15.2507	0.139986	-0.661290	1.13389
wig_s_r	0.127251	0.777453	4.51751	22.4778
djia_s_r	0.185626	0.358298	-0.123789	-0.0151061
dax_s_r	0.219091	0.354368	0.259095	-0.459347
wig_s_xl	48.1728	0.351312	0.954374	1.24787
dax_s_xl	23.5015	0.202157	-0.411218	-0.353296
djia_s_xl	15.1049	0.134506	-0.116865	-0.112928
hp_wig_s	147.036	4,51311e+014	4.61947	32.0772
hp_dax_s	17.6497	7,87730e+013	0.150181	-0.0467429
hp_djia_s	10.9848	8,75079e+013	-0.00374463	1.98034
Variable	Percentile 5%	Percentile 95%	Range Q3–Q1	
wig_s	63.5906	311.720	46.8929	
dax_s	63.2314	146.006	31.4257	
djia_s	81.7885	132.878	16.7936	
wig_s_r	0.0765385	0.288732	0.0584174	
djia_s_r	-0.875392	-0.202811	0.227136	
dax_s_r	-0.959943	-0.246456	0.324604	
wig_s_xl	75.3711	229.934	70.5670	
dax_s_xl	75.2722	150.163	36.5584	
djia_s_xl	83.4498	134.579	20.6334	
hp_wig_s	-207.535	54.8228	35.7846	
hp_dax_s	-29.7295	29.6484	22.7352	
hp_djia_s	-16.3402	19.4364	11.5020	

Table A3. Outlying values of the time series after removing seasonality (name\_s) after applying the Hodrick-Prescott filter (hp\_name\_s), subjecting to analysis TRAMO/SEATS (name\_s\_xl) and the use of membership function (name\_s\_r) (04/1992-09/2014)

<b>djia_s</b>	<b>dax_s</b>	<b>wig_s</b>
199 IO (10 2008)	199 IO (10 2008)	25 IO (4 1994)
114 AO (9 2001)	132 TC (3 2003)	14 IO (5 1993)
197 AO (8 2008)	114 TC (9 2001)	41 AO (8 1995)
	245 LS (8 2012)	37 IO (4 1995)
	79 AO (10 1998)	39 TC (6 1995)
	246 AO (9 2012)	76 AO (7 1998)
	241 LS (4 2012)	199 IO (10 2008)
	197 TC (8 2008)	196 AO (7 2008)
		202 AO (1 2009)
		108 AO (3 2001)
		82 AO (1 1999)
		4 LS (7 1992)
		32 IO (11 1994)
		78 IO (9 1998)
<b>djia_s_r</b>	<b>dax_s_r</b>	<b>wig_s_r</b>
216 TC (3 2010)	199 LS (10 2008)	25 TC (4 1994)
211 IO (10 2009)	80 AO (11 1998)	22 IO (1 1994)
215 TC (2 2010)	216 TC (3 2010)	20 IO (11 1993)
114 AO (9 2001)	245 IO (8 2012)	23 TC (2 1994)
143 TC (2 2004)	246 AO (9 2012)	14 IO (5 1993)
	97 LS (4 2000)	17 IO (8 1993)
		26 TC (5 1994)
		15 IO (6 1993)
		34 IO (1 1995)
		28 IO (7 1994)
		32 IO (11 1994)
		21 LS (12 1993)
		13 IO (4 1993)
		76 AO (7 1998)
		18 IO (9 1993)
		37 IO (4 1995)
		46 TC (1 1996)
		29 IO (8 1994)
		39 LS (6 1995)
		42 TC (9 1995)
		183 TC (6 2007)
<b>hp_djia_s</b>	<b>hp_dax_s</b>	<b>hp_wig_s</b>
199 IO (10 2008)	246 AO (9 2012)	25 LS (4 1994)
216 TC (3 2010)	245 LS (8 2012)	22 IO (1 1994)

Cont. Table A3

114 AO (9 2001)	199 IO (10 2008)	23 TC (2 1994)
143 TC (2 2004)	217 LS (4 2010)	26 LS (5 1994)
197 AO (8 2008)		16 AO (7 1993)
212 LS (11 2009)		14 IO (5 1993)
64 TC (7 1997)		27 AO (6 1994)
245 TC (8 2012)		20 IO (11 1993)
227 AO (2 2011)		24 IO (3 1994)
80 IO (11 1998)		
73 TC (4 1998)		183 AO (6 2007)
		15 IO (6 1993)
<b>djia_s_xl</b>	<b>dax_s_xl</b>	<b>wig_s_xl</b>
NO OUTLIERS DETECTED	NO OUTLIERS DETECTED	NO OUTLIERS DETECTED

Table A4. Measures of forecasting accuracy ex post (obtained with correct and conditional maximum likelihood method) in the range of verification (02-09/2014) of series of dynamics of stock market indices with seasonality removed (name\_s) after applying the Hodrick-Prescott filter (hp\_name\_s), subjecting to the analysis TRAMO/SEATS (name\_s\_xl) and the use of membership function (name\_s\_r) (04/1992-09/2014)

	Unconditional maximum likelihood method						Conditional maximum likelihood method					
	wig_s	wig_s_r	hp_wig_s	wig_s_xl	wig_s	wig_s_r	hp_wig_s	wig_s_xl	wig_s	wig_s_r	hp_wig_s	wig_s_xl
Measures of ex post forecasting accuracy (For the 99% confidence interval $z(0.005) = 2.58$ )												
Non-seasonal (p, d, q)	(3,1,1)	(2,1,0)	(2,1,0)	(1,1,0)	(3,1,1)	(2,1,0)	(2,1,0)	(1,1,0)	(3,1,1)	(2,1,0)	(2,1,0)	(1,1,0)
Seasonal (P, D, Q)	(1,0,1)	(0,0,1)	(0,0,0)	(0,0,1)	(1,0,1)	(0,0,1)	(0,0,0)	(0,0,1)	(1,0,1)	(0,0,0)	(0,0,0)	(0,0,1)
Mean prediction error ME	= 6.2559	0.005095	1.5199	14.273	4.7526	0.005422	0.96193	13.993				
Mean square error MSE	= 51.058	4.36-05	22.207	220.88	34.422	4.66-05	22.751	212.49				
Root mean square error:RMSE	= 7.1455	0.006601	4.7125	14.862	5.867	0.006823	4.7698	14.577				
Mean absolute error MAE	= 6.3551	0.005959	3.8337	14.273	5.4191	0.006157	3.7259	13.993				
Mean percentage error MPE	= 5.496	3.5872	-148.12	8.346	4.1515	3.824	-115.28	8.1777				
Mean absolute percentage error MAPE	= 5.5902	4.2506	324.92	8.346	4.7845	4.3893	275.8	8.1777				
Theil index (percent) I	= 1.3614	1.0303	1.1633	1.9462	1.0857	1.0674	1.1274	1.9048				
Share of prediction biasedness $I1^2/I^2$	= 0.7665	0.59575	0.10402	0.92234	0.65619	0.63137	0.040671	0.92142				
Share of insufficient flexibility $I2^2/I^2$	= 0.015362	0.005125	0.3136	0.0028446	0.015691	0.000228	0.39821	0.00107				
Share of direction non-compliance $I3^2/I^2$	= 0.21814	0.39912	0.58238	0.074811	0.32812	0.3684	0.56112	0.077508				
	dax_s	dax_s_r	hp_dax_s	dax_s_xl	dax_s	dax_s_r	hp_dax_s	dax_s_xl				
Non-seasonal (p, d, q)	(0,1,1)	(0,1,1)	(0,1,0)	(1,1,0)	(0,1,1)	(0,1,1)	(0,1,0)	(1,1,0)				
Seasonal (P, D, Q)	(0,0,1)	(0,0,1)	(0,0,1)	(0,0,1)	(0,0,1)	(0,0,1)	(0,0,1)	(0,0,1)				
Mean prediction error ME	= -1.6056	-0.4017	-3.784	1.3653	-1.453	-0.03934	-3.6496	1.5229				
Mean square error MSE	= 8.4753	0.002861	26.39	18.636	8.1856	0.002747	25.49	18.791				
Root mean square error:RMSE	= 2.9112	0.053486	5.1371	4.3169	2.8611	0.052411	5.0488	4.3348				
Mean absolute error MAE	= 2.1332	0.04271	4.1872	4.0277	2.1104	0.041821	4.1312	4.0256				
Mean percentage error MPE	= -1.3942	6.5621	94.064	0.95622	-1.2634	6.4287	95.44	1.0772				
Mean absolute percentage error MAPE	= 1.8219	7.0723	110.46	3.0601	1.8	6.9264	111.75	3.0556				

Theil index (percent) I	=	0.79187	1.0932	1.8879	1.0526	0.77599	1.0722	1.8813	1.0546
Share of prediction biasedness $I1^2/I^2$	=	0.30416	0.56398	0.54258	0.10002	0.2579	0.56344	0.52253	1.23-01
Share of insufficient flexibility $I2^2/I^2$	=	0.000428	0.19933	0.000288	0.051902	0.001127	0.19518	7,11-05	0.048044
Share of direction non-compliance $I3^2/I^2$	=	0.69542	0.23669	0.45713	0.84807	0.74097	0.24138	0.4774	0.82853
		djia_s	djia_s_r	hp_djia_s	djia_s_xl	djia_s	djia_s_r	hp_djia_s	djia_s_xl
Non-seasonal (p, d, q)		(0,1,0)	(0,1,1)	(0,1,0)	(0,1,0)	(0,1,0)	(0,1,1)	(0,1,0)	(0,1,0)
Seasonal (P, D, Q)		(0,0,1)	(0,0,1)	(0,0,1)	(0,0,1)	(0,0,1)	(0,0,1)	(0,0,1)	(0,0,1)
Mean prediction error ME	=	-2.3804	-0.05138	-3.2368	-2.5803	-2.1948	-0.04983	-3.0836	-2.3544
Mean square error MSE	=	10.283	3.14-03	14.332	1.24 + 01	9.6386	0.002994	13.511	11.539
Root mean square error RMSE	=	3.21 + 00	0.055996	3.79 + 00	3.5171	3.1046	0.054721	3.6758	3.3969
Mean absolute error MAE	=	2.7005	0.051375	3.2368	2.9424	2.5979	0.049834	3.0846	2.7969
Mean percentage error MPE	=	-2.148	10.374	272.37	-2.1227	-1.982	10.059	259.16	-1.9387
Mean absolute percentage error MAPE	=	2.4305	10.374	272.37	2.4138	2.3381	10.059	259.26	2.2944
Theil index (percent) I	=	1.3109	1.8256	2.9836	1.3203	1.2678	1.7816	2.834	1.275
Share of prediction biasedness $I1^2/I^2$	=	0.55102	0.84177	0.73102	0.53823	0.49977	0.82936	0.70376	0.4804
Share of insufficient flexibility $I2^2/I^2$	=	0.16915	0.0132	0.065	0.17196	0.19866	0.016995	0.077444	0.20539
Share of direction non-compliance $I3^2/I^2$	=	0.27983	0.14503	0.20398	0.28981	0.30156	0.15365	0.21879	0.31422

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## From micro- to macroprudential policy. On the changing nature of financial supervision around the world

### Introduction

The causes and mechanisms of the spread of the Global Financial Crisis (GFC) are still the subject of controversy. Economists agree as to the complex nature of the causes of the crisis (searching for its origins in the financial, economic, regulatory and supervisory, psychological and even cultural domains [cf. Obstfeld and Rogoff 2007, 2009; Bini Smaghi 2008; Roubini 2008; BIS 2009; Taylor 2009, 2010; Levine 2010; Merrouche and Neir 2010; Roubini and Mihm 2010; Wojtyna 2010; Cukierman 2011; Barth, Caprio and Levine 2012]). Similarly, they unanimously assess the lack of a comprehensive use of mainstream economics to explain the outbreak and the course of the crisis<sup>2</sup>. This has led many researchers to return their attention to the theory of Keynes, in particular his work *Treatise on Money* [Leijonhufvud 2008]. As much attention is paid to an attempt to clarify the mechanism linking phenomena in the sphere of the finance and the real economy, which makes researchers turn their attention again to the theory of Hyman Minsky [Minsky 1992]. Interest has also emerged in behavioural economics in relation to the opportunity to explain, on its basis, the importance of speculative bubbles or herd behaviour [Sławiński 2007].

Undoubtedly one of the most important consequences of the global financial crisis will be significant changes in the regulatory and legal sphere of financial systems. The pre-crisis regulatory and supervisory structure has been aptly described by Schinasi [2010] as “patchwork of rules of the game and regulatory and supervisory principles”. The global crisis has exposed the weaknesses of microprudential approach, in particular those relating to capital requirements. It emphasized, among others, disregarding the mechanisms limiting systemic risks in the existing capital

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<sup>2</sup> This issue is important in that without a comprehensive diagnosis of the causes of the crisis the institutional framework of financial safety net cannot be properly designed.

requirements. Developing new regulatory and legal solutions will be a long process, but even now one can see a clear trend towards the widespread use of macroprudential approach in ensuring financial stability<sup>3</sup>.

The main objective of this article is to analyse and evaluate changes in the use of widely understood macroprudential approach in the individual financial systems. The study has used an extensive database on the use of macroprudential instruments in 119 countries in the period 2000–2013 [Cerutti, Claessens and Laeven 2015].

The article consists of three parts, introduction and conclusion. The introduction clarifies the essence of macroprudential supervision, noting the distinctive features of this approach, particularly in comparison with the microprudential approach. Section two is devoted to discuss macroprudential instruments, referring mainly to the relationships that exists between the instrument and the source of systemic risk. In section three we analyse the trends in the use of macroprudential approach present in 119 countries in the period 2000–2013, taking into account the diversity of macroprudential policy instruments and the characteristics of the development of individual economies<sup>4</sup>. The conclusion includes the generalizing findings of the analysis.

## 1. The essence of macroprudential policy

The macroprudential approach in supervisory and regulatory activities is not an innovative solution. Many central banks and supervisory institutions used them in the period preceding the Global Financial Crisis, however – more as an ancillary instruments, rather than as a deliberately chosen base for strategies of these institutions. There was much talk about the benefits of this approach in an environment of economists of the Bank for International Settlements (BIS) and the International Monetary Fund (IMF) in the early 2000s [Evans et al. 2000; Borio 2003].

Macroprudential policy should be understood as adoption of a well-defined perspective (orientation) in the financial supervision [Borio 2010]. This perspective is completely different from the microprudential approach commonly used to date (cf. Table 1). What distinguishes the macroprudential approach is a holistic (systemic) look at the issue of risk, its sources or ways of materialization. Also, the impact of this policy should have a systemic dimension (i.e. impact on the entire financial system, and indeed even beyond the system and also operating on the ‘joint’ of the financial system and the real economy [Szpunar 2012, p. 9]).

<sup>3</sup> For example, in the EU countries, the new supervisory regulations, taking into account a broadly defined set of macroprudential instruments, were put into force on 1 January 2014 [cf. ESRB 2014].

<sup>4</sup> The data are analysed separately for three groups of countries (developed, emerging and developing countries). Classification is based on the income criterion [IMF 2014].

Table 1. The macro- and microprudential perspective

Features	Macroprudential	Microprudential
Proximate objective	limit financial system-wide distress	limit distress of individual institutions
Ultimate objective	avoid output (GDP) costs	consumer (investor/ depositor) protection
Model of risk	(in part) endogenous	exogenous
Correlations and common exposures across institutions	important	irrelevant
Calibration of prudential controls	in terms of system-wide distress; top-down	in terms of risks of individual institutions; bottom-up

Source: [Borio 2003].

The essence of macroprudential supervision can be determined by defining its three dimensions [Financial Stability Board 2011]:

- objective of supervision: reducing and preventing systemic risk and through this action, contributing to ensuring financial stability,
- scope of supervision: the entire financial system,
- supervisory instruments: a set of instruments is largely identical to that used in the microprudential supervision, but the prospect of their use is systemic.

It should be noted that in the framework of macroprudential policy, a regulatory and supervisory institution (authority) tries to maintain the stability of the financial system, whose immediate threat may be a side effect (externality) of the behaviour of individual financial institutions, as well as the structure of the financial system [Giese et al. 2013].

Although the definition of macroprudential supervision does not present much difficulty, the implementation of this approach and its operationalization for the needs of the policy is no longer so clear. One of the proposed analytical approaches to macroprudential approach is the inclusion of two of its dimensions [Borio 2010]: time dimension, in which the instruments are used to limit pro-cyclicality in the financial system and cross-sectional dimension, in which the analysis includes common exposure and interlinkages in the financial system at a point in time [more on the theoretical basis of cross-sectional nature of systemic risk, see: Jensen 1986; Calomiris and Khan 1991; Hellwig 1995; Calomiris 2009]. The sources of pro-cyclicality in the financial system may include:

- the nature of prior capital requirements [Saurina and Trucharte 2007; Repullo, Saurina and Trucharte 2009];
- practices used by banks in terms of collateral valuation [Borio, Furfine and Lowe 2001];
- loan loss provisions [Borio, Furfine and Lowe 2001];
- haircut-setting and margining practices in securities financing and OTC derivatives transactions [Committee 2010].

Identification of the most important reasons for the materialization of systemic risk allows to properly design a framework for macroprudential policy (the purpose and the tools and the ability to calibrate variables).

## 2. Macroprudential policy tools

The tools used in the framework of macroprudential supervision should contribute to reducing systemic risk. Identification of applicable tools has been preceded by the selection of potential sources of systemic risk [ESRB 2013; IMF 2013] (see Figure 1).

A set of macroprudential policy instruments has been designed in a way enabling the impact within a single policy on many, often very ‘analytically distant’ potential sources of systemic risk. Hence, some instruments are systemic in nature (e.g. countercyclical buffer), other sectoral, or even referring to a specific group of financial institutions. Some instruments are used to influence the system of incentives of lenders (e.g. capital instruments), others, in turn, directly determine the behaviour of borrowers (e.g. loan-to-value ratio, loan-to-income ratio). Finally, some instruments interact as restrictions in relation to the balance sheet of banks (e.g. capital instruments, large exposure limits), and others work through market discipline (e.g. higher disclosure requirements).

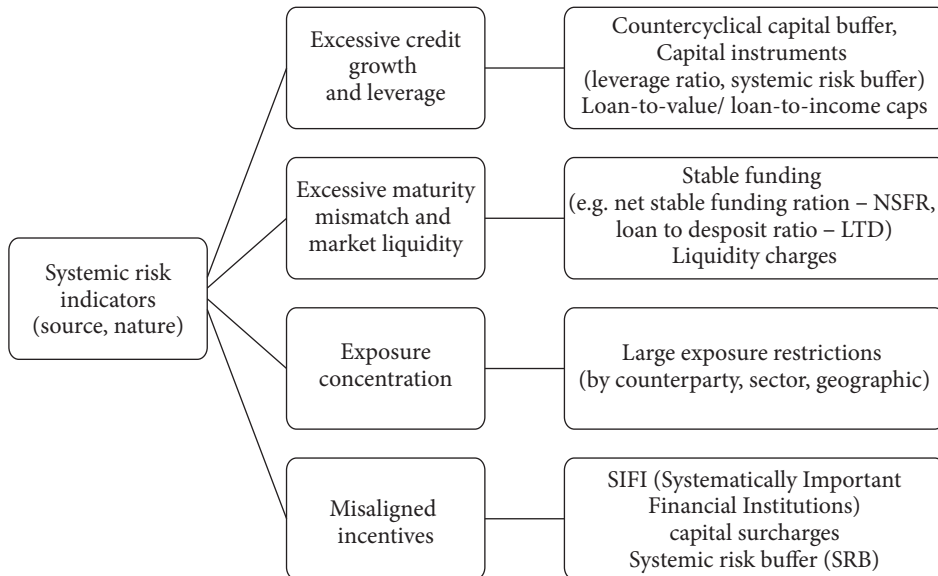


Figure 1. Relationship between systemic risk sources and macroprudential tools

Source: Author's compilation on: [ESRB 2014]

The set of instruments used in the framework of macroprudential policy is broad, but there are clear differences between countries, due to a different definition of the instruments, and the occurrence of diverse institutional arrangements (both implicit and explicit) in macroprudential policy, which effectively make it difficult to identify individual instruments. The most comprehensive study of the use of macroprudential policy instruments was conducted by IMF team<sup>5</sup>, as a result of which, a unified set of instruments was proposed (cf. Table 2).

Table 2. Review of macroprudential policy instruments

Instrument/group	Symbol	Definition
Loan-to-Value Ratio	LTV	Constrains highly levered mortgage downpayments by enforcing or encouraging a limit or by determining regulatory risk weights
Debt-to-Income Ratio	DTI	Constrains household indebtedness by enforcing or encouraging a limit
Time-Varying/ Dynamic Loan-Loss Provisioning	DP	Requires banks to hold more loan-loss provisions during upturns
General Countercyclical Capital Buffer	CTC	Requires banks to hold more capital during upturns
Leverage Ratio	LEV	Limits banks from exceeding a fixed minimum leverage ratio
Capital Surcharges on SIFIs	SIFI	Requires Systemically Important Financial Institutions to hold a higher capital level than other financial institutions
Limits on Interbank Exposures	INTER	Limits the fraction of liabilities held the banking sector or by individual banks
Concentration Limits	CONC	Limits the fraction of assets held by a limited number of borrowers
Limits on Foreign Currency Loans	FC	Reduces vulnerability to foreign-currency risks
Reserve Requirement Ratios	RR	Limits credit growth; can also be targeted to limit foreign-currency credit growth
Limits on Domestic Currency Loans	CG	Limits credit growth directly
Levy/ Tax on Financial Institutions	TAX	Taxes revenues of financial institutions
Loan-to-Value Ratio Caps	LTV-CAP	Restricts to LTV used as a strictly enforced cap on new loans, as opposed to a supervisory guideline or merely a determinant of risk weight
FX and/ or Countercyclical Reserve Requirements	RR-REV	Restricts to RR which imposes a wedge of on foreign currency deposits

Notes:

LTV and RR are not directly taken into account for Macroprudential Index, however there are used as background for LTV-CAP and RR-REV measures.

Macroprudential Index (0–12): LTV-CAP + DTI + DP + CTC + LEV + SIFI + INTER + CONC + FC + RR-REV + CG + TAX.

Borrower-Targeted Instruments (0–2): LTV-CAP + DTI.

Financial Institution-Targeted Instruments (0–10): DP + CTC + LEV + SIFI + INTER + CONC + FC + RR-REV + CG + TAX.

Source: [Cerutti, Claessens and Laeven 2015].

<sup>5</sup> The study 'Global Macroprudential Policy Instruments' was conducted in 2013–2014 on a group of 119 countries and it covers the years 2000–2013.

The individual variables were aggregated by building three indicators to assess the use of macroprudential instruments<sup>6</sup>. And so, two variables are directly related to the behaviour of borrowers (LTV-CAP and DTI), and the remaining ten are the effects of impact on financial institutions. All twelve instruments form the Macroprudential Index (MPI), and its value ranges from 0 to 12.

### 3. Empirical evidence on the use of macroprudential policies

Research in the field of tendency to use macroprudential policy instruments was performed separately for three groups of countries (developed countries – 31 countries, emerging countries – 64 countries and developing countries – 24 countries). Descriptive statistics for the analysed groups of countries in 2000 and 2013 is presented in Table 3. The average value of the Macroprudential Index was strongly differentiated in 2000, with the highest value recorded for emerging countries, and the lowest for developed countries. In all countries, there was a sharp increase in 2013, compared to 2000. Similarly varied were the minimum and maximum index values, but it is worth emphasizing the fact that in 2013, there were still countries (in each of the analysed groups), which did not use any instrument of macroprudential policy (minimum MPI = 0). The variability of the studied characteristic in the analysed groups was measured using standard deviation and variation coefficient, and the obtained values allow to infer the increasing volatility in the intensity of use of instruments in the analysed countries, with the exception of developing countries for which the coefficient of variation was reduced in the years 2000–2013 (from 80.8% to 63.4%).

Table 3. Descriptive statistics of data

Feature	Advanced countries		Emerging countries		Developing countries	
	2000	2013	2000	2013	2000	2013
Year	2000	2013	2000	2013	2000	2013
Mean	0.806	2.129	1.250	2.703	1.208	2.458
Min	0	0	0	0	0	0
Max	3	5	6	8	3	7
Standard deviation	1.014	1.586	1.380	1.874	0.977	1.560
Variation coefficient	102.8%	251.6%	110.4%	69.3%	80.8%	63.4%

Source: Author's calculation on: [Cerutti, Claessens and Laeven 2015].

<sup>6</sup> The proposed classification is similar to that proposed in previous studies [Bank of England 2009; Schoenmaker and Wiert 2011; ESRB 2014].

Figure 2 presents the trends in the development of the average level of Macroprudential Index in the period from 2000 to 2013 for three separate groups of countries: advanced, emerging and developing.

Based on Figure 2, one can identify the following regularities. First, the value of the index in 2000 in emerging and developing countries was at a similar – much higher than in advanced countries – level. Secondly, development trends were different in terms of index values in subsequent years in relation to the advanced countries (where the index value remained relatively low and stable until 2006) and the other two groups of countries (where the index value clearly increased throughout the studied period). Thirdly, over the period, it can be identified a gap between the advanced countries and emerging countries (the index value throughout the period was for advanced countries on average lower by 0.82 point, and in 2006–2009 the difference increased to 1 point).

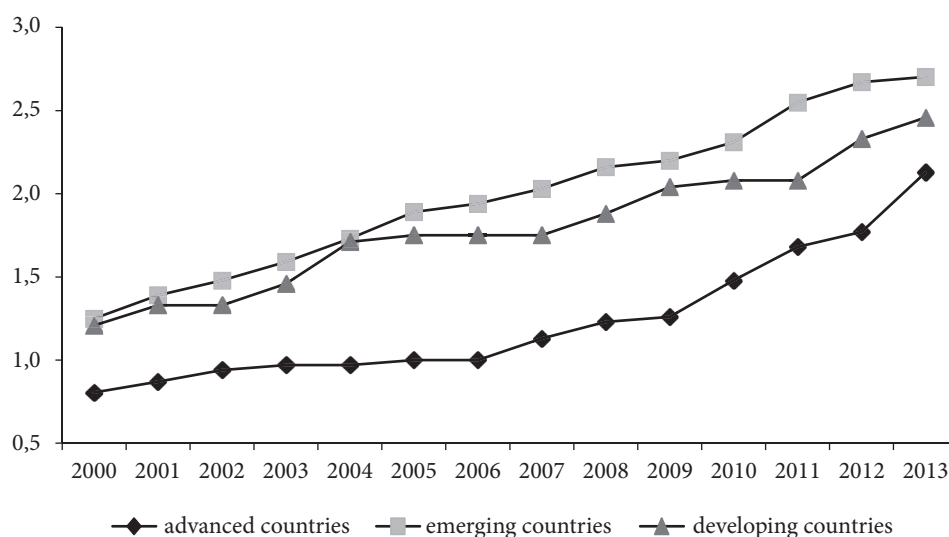


Figure 2. Tendencies in using macroprudential tools in advanced, emerging and developing countries (2000–2013)

Source: Author's calculation on: [Cerutti, Claessens and Laeven 2015]

Table 4 summarizes the data on the frequency of use of each macroprudential policy instrument in the three groups of countries in 2000 and 2013. For all instruments and groups of countries (except RR-REV and CG for advanced countries, which instruments were not used both in 2000 and 2013, and RR, whose frequency of use has not changed), there was increase in the frequency of use of macroprudential instruments.



Table 4. Frequency of using macroprudential policy tools in 2000 (2013) (in %)

Tool	Advanced countries	Emerging countries	Developing countries
LTV-CAP	13 (42)	9 (28)	0 (13)
DTI	3 (23)	5 (28)	0 (4)
DP	3 (3)	0 (14)	13 (17)
CTC	0 (6)	0 (3)	0 (4)
LEV	6 (13)	8 (22)	4 (13)
SIFI	0 (10)	0 (3)	0 (8)
INTER	16 (29)	19 (31)	4 (21)
CONC	35 (45)	47 (70)	54 (71)
FC	0 (10)	8 (22)	4 (17)
RR	6 (6)	33 (45)	38 (50)
RR-REV	0 (0)	16 (22)	25 (33)
CG	0 (0)	8 (11)	8 (29)
TAX	3 (32)	6 (16)	8 (17)

Source: Author's calculation on: [Cerutti, Claessens and Laeven 2015].

When analysing separately the three groups of countries, it is worth paying attention to the scale of growth in the prevalence of use of each instrument in the countries surveyed. In the group of advanced countries the largest increase occurred in relation to the LTV-CAP and TAX (by almost 30 percentage points), DTI (20 percentage points) and INTER and CONC (about 10 percentage points). In the group of emerging countries an increase can be observed by more than 10 percentage points for most of the instruments (except for four: CTC, SIFI, RR-REV and CG). In the group of developing countries there was a marked increase in the prevalence of use of six instruments (CG – 20 percentage points, INTER and CONC – 17 percentage points and LTV-CAP, FC and RR – 13 percentage points).

Analysis of the data presented in Figure 3 allows us to formulate specific conclusions on intensity of use of the various macroprudential instruments in 2013 in advanced, emerging and developing countries. Macroprudential policy is used with the greatest intensity by emerging countries, in particular with regard to the instruments related to the evolution of the exchange rate. These countries generally have a less stable currency, which can be an additional source of systemic risk. The instruments for the direct discipline of borrowers (i.e. LTV and DTI) are relatively intensively used in advanced countries. One can also identify these instruments, the use of which is not very common (CTC, SIFI and DP, and RR in the case of advanced countries) or which are not used at all (RR-REV and CG in relation to advanced countries).

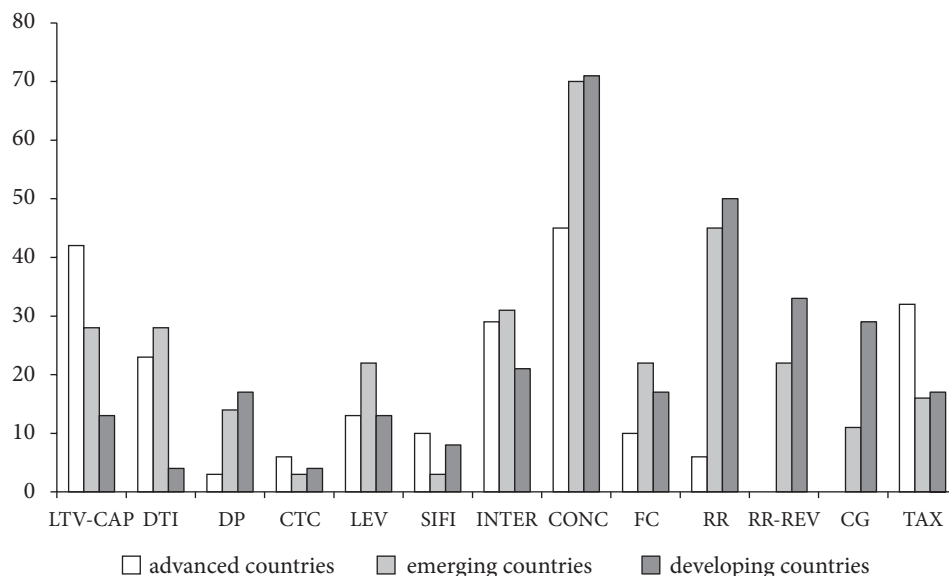


Figure 3. Frequency of using macroprudential tools across countries (2013)

Source: Author's calculation on: [Cerutti, Claessens and Laeven 2015]

Figure 4 presents the countries with the most extensive use of macroprudential policy instruments in 2013. Additionally – for the cognitive purposes – the development of macroprudential index (MPI) in these countries in 2000 has been shown. The undisputed leader of the list is Pakistan, where authorities have declared the use of 9 out of 12 analysed instruments. The next group of countries with MPI value equal to 8 includes China, Colombia and Mongolia and then Ecuador and Ukraine with MPI value equal to 7. With regard to these last two, it is worth noting the high increase in the intensity of use of macroprudential instruments in the years 2000–2013. Six more countries (Argentina, Chile, Peru, Romania, Singapore and Turkey) obtained the value of MPI equal to 6 and in this group of countries Chile should be emphasized, characterized by the highest intensity of the use of macroprudential policy in 2000 among all the countries surveyed. It is worth mentioning that in the group of twelve countries with the highest MPI there was only one country from the group of advanced countries (Singapore) and one from the group of developing countries (Mongolia).

The mere use of macroprudential instruments undoubtedly contributes to the stability of the financial system, but it does not guarantee it. It seems that the key issue is the effectiveness of this action, i.e. effectiveness of individual regulatory and supervisory instruments. Experience with the use of macroprudential policy, however, is still small and short time series, represent a significant barrier to the use of econometric modelling to assess the effectiveness of the instruments of this policy.

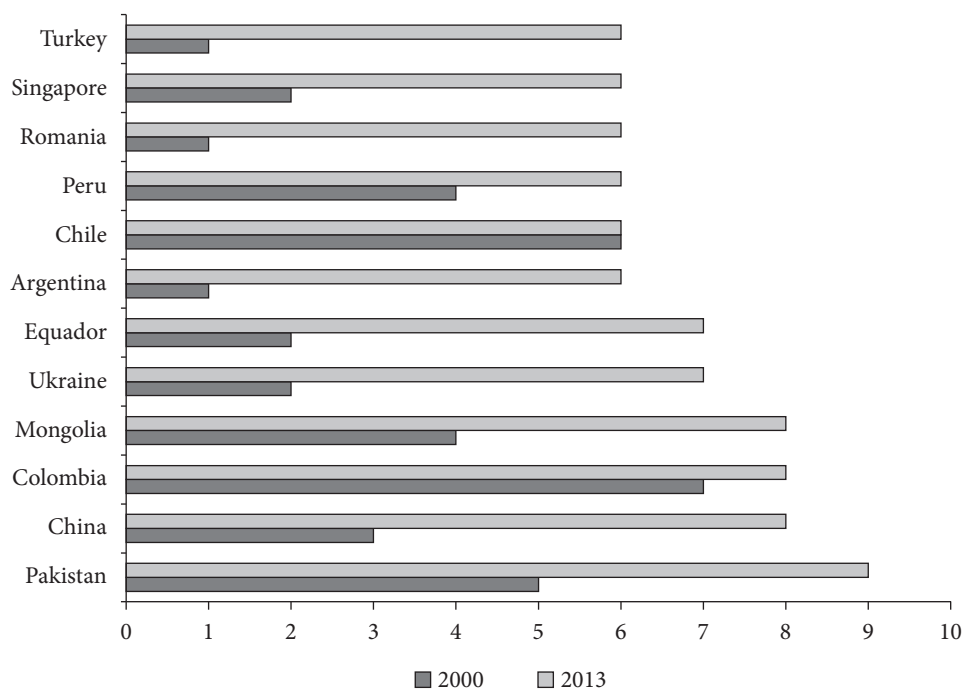


Figure 4. Global leaders in using macroprudential tools in 2013

Source: Author's calculation on: [Cerutti, Claessens and Laeven 2015]

Table 5. Review of empirical studies – effectiveness of macroprudential tools

Study	Scope	Instruments	Conclusions
Lim et al. 2011	49 advanced and emerging countries	LTV, DTI, ceilings on credit growth, reserve requirements, dynamic provisioning rules	reduction in the procyclicality of credit and leverage
Claessens, Ghosh and Mihet 2014	2800 banks in 48 advanced and emerging countries	LTV and DTI caps, and credit growth and foreign currency lending limits	reduction in the growth in bank's leverage, asset and non-core to core liabilities growth
		countercyclical buffers	help mitigate increases in bank leverage and assets
Zhang and Zoli 2014	13 Asian economies and 33 other economies	loan-to-value ratio caps, housing tax measures, and foreign currency-related measures	helped curb housing price growth, equity flows, credit growth, and bank leverage
Cerutti, Claessens and Laeven 2015	119 countries (advanced, emerging and developing)	broad set of macroprudential tools	reductions in the growth rate in credit (notably in household credit)
Akinci and Olmstead-Rumsey 2015	57 advanced and emerging countries	LTV, DTI, countercyclical capital requirements, dynamic provisioning, consumer loan limits, credit growth ceilings	reduction in bank credit growth, housing credit growth, and house price inflation

Source: Author's compilation.

However, the first more or less comprehensive attempts are being made to assess the effectiveness of various macroprudential policy instruments [cf. Crowe et al. 2011; Lim et al. 2011; Dell'Ariccia et al. 2012; Bruno, Shim and Shin 2014; Claessens, Ghosh and Mihet 2014; Zhang and Zoli 2014; Cerutti, Claessens and Laeven 2015; Akinci and Olmstead-Rumsey 2015]. Review of the results of selected studies comprises Table 5.

## Conclusions

The global financial crisis has caused the loss on an unprecedented scale. The main cause of this crisis was the materialisation of systemic risk associated directly with the huge scale and at the same time the concentration of lending in the United States. Despite the existence and active operation of many institutions involved in the stabilisation of the financial system, the risk was completely out of control of the regulatory and supervisory authorities. Analysing the situation ex-post, one can argue that macroprudential supervision was lacking in the financial system.

The objective of macroprudential policy should be financial sustainability, achieved through systematic prevention of the emergence of imbalances and the materialization of systemic risk. The universally applicable view of the importance of macroprudential policy seems to be getting stronger impact on the practice of the regulatory and supervisory authorities, i.e. the clear emphasis on macroprudential approach in the framework of stabilizing the financial system.

Despite the difficulties caused by the classification and identification of instruments of macroprudential policy, attempts are made to research and the issue of the use of this policy, as well as the effectiveness of individual instruments. The article analyses and assesses the global trends in the use of macroprudential instruments, and the results are clear. In all the analysed groups of countries there has been a marked increase in the intensity of use of macroprudential policy, to the greatest extent in the group of emerging countries. These countries – due to the very specific characteristics, i.e. dynamic growth, greater openness of economies, weak and unstable currency, rapidly growing financial markets – tend to be most vulnerable to the materialization of systemic risk.

It is worth noting that although the use of macroprudential policy is now almost universal, still there are many controversial issues, both theoretical and practical. There is no consensus on such important issues as: the institution, which should be entrusted with the mandate in the field of macroprudential policy (and in particular the role of the central bank in the implementation of this policy), structuring the relationship between macroprudential and monetary policies and between macroprudential policy and the Ministry of Finance [Nier et al. 2011], action on

the basis of the rules versus discretion dilemma. Experience of individual countries in the application of macroprudential policy instruments will undoubtedly provide many answers, but probably will also lead to more questions. It therefore seems that the immediate future in relation to the regulatory and legal and supervisory framework of financial systems will be dominated by macroprudential approach.

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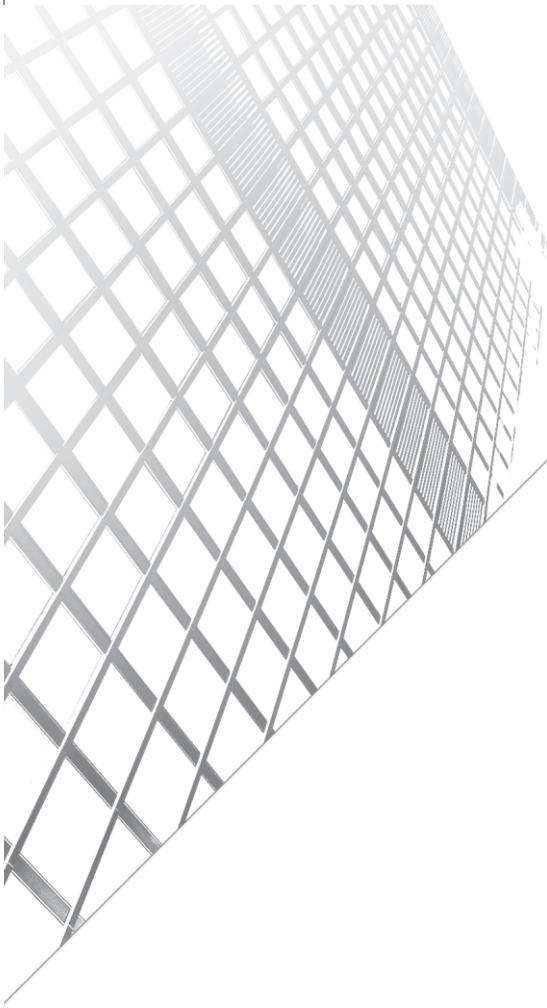
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# Supply Chains as a Tool for Internationalization



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# Evolution of management of international supply networks and chains

## Introduction

International logistics, rapidly growing in the twenty-first century, is regularly stimulated by the evolution of international management. Moreover, globalization has developed transnational corporations, which are characterized by the globalization of market presence, capital base, corporate thinking and, above all, the globalization of the supply chain. Therefore, the purpose of this discussion is to demonstrate the essence of the relationship between the evolution of the management of international supply networks and chains and a new quality of international business management. In pursuit of this objective, the results of empirical research, conducted in the years 2000–2015, and a forecast for the development of logistics by 2020 were presented.

Successively, substantive principles and rules have been developed for the implementation of logistics policy of the European Union in international companies, especially transnational corporations. As a result, original paradigms of the European logistics policy have been developed as a basis for the development of international logistics.

## 1. Conditions of evolution

The evolution of the management of international supply networks and chains has its causes. They include the changing competitive requirements, the process of globalization and technological progress in the field of instruments for supporting enterprise management.

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Transformations of the sources of competitive advantage in a variety of industries went from fixed through stable, then temporary to the occasional, which means that this evolution can be broadly described as transition from order to uncertainty [Brown and Eisenhardt 1998, p. 8].

The first distinguished type of competitive conditions creates the opportunity to develop a sustainable competitive advantage. It is a consequence of taking the position of a cost leader or functionality leader and consists in finding a market, access to which is difficult for competitors. The main task is to maintain this difficulty by building up heaps the barriers to entry.

Another type of competitive conditions is the opportunity to develop a stable competitive advantage. In the 1980s Birgel Wernerfelt noted that it is customary for the formation of competitive advantage to recommend taking a more attractive position in the market environment of the company. Meanwhile, according to this author, the real source of this advantage is having better resources [Ghemawat 2002, p. 31]. Therefore, the real competitive battle is not held outside the enterprise in the market in which it operates, but on the inside. The goal is to accumulate strategically more valuable resources, since they allow the stabilization of competitive advantage. Stable competitive advantage is due to the possibility of being the first to offer products which are attractive to the customers.

Another variety of competitive conditions is the opportunity to develop a temporary competitive advantage. Behaviour of enterprises in the market can be seen as a result of the game taking place between them for the realization of values significant to them. The desire of many companies to develop competitive advantage can be thus interpreted in terms of game theory. A company achieves a satisfactory competitive position only for a short time, and then as a result of changes in conditions it begins to generate the economic results (the game winnings) below the level accepted by the stakeholders. It is therefore compelled to seek a new strategy and a new competitive position. In the course of this search it creates coalition with partners sharing the same economic interests. Enterprises thus begin to simultaneously compete and cooperate with each other. The phenomenon called co-competition occurs [Cygler 2007, p. 61].

Finally, we may speak about conditions of competition which prevent the development of any intentional competitive advantage. It may be only occasional in nature, or be transient competitive advantage. Lucy Thomas and Richard D'Aveni believe that the cause of this condition is pervasive innovative dynamism implemented along the entire supply chain, from its beginning to an end customer, what is more, throughout the entire life of the chain. The formed competitive position is therefore at no time fixed, on the contrary, its sources are subject to constant erosion. Gaining competitive advantage is rarely the result of having any particular resources, because at most they could have been the reason for the success in the past, and from the point of view of an unknown future they usually block the development

of the company. Adaptation to the new competitive situation usually requires the destruction of resources held, which resembles the essence of competition in the meaning of Schumpeter [Thomas and D'Aveni 2012, pp. 9–11].

Therefore, transformations in the field of competitive conditions make the economic success cease to depend on activity of a single company, and become the result of joint efforts of a group of companies usually making up a supply network or chain.

In analysing the development of international business Elżbieta Gołemska indicates the need to systematize it into three stages [Gołemska 2014, pp. 38–42]. The first stage begins with the end of the Second World War and lasts until the end of the 1980s. It is characterized by dynamic growth of foreign direct investment and the emergence of transnational corporations, and in its wake the intensification of the process of market globalization. During this period, mainly due to the views of Theodore Levitt, a very optimistic point of view prevailed on the development of international business, as creation of the so called global village was expected thanks to the dissemination of the global consumption pattern leading to the creation of a unified and homogenous global market. This vision preferred transnational corporations as major economic organizations, able to discount the effect of scale in production and trade in standardized global products [Stonehouse et al. 2001, p. 5]. Of course, it entailed a dynamic growth of international trade, and the emerging needs for transportation and storage, which initiated development of international logistics as a specialized field of knowledge and profession. After the collapse of the so-called Iron Curtain in the period from the beginning of the 1990s to the end of the twentieth century, there occurred the second stage of the development of international business. It was characterized by the further internationalization of business activity and, due to the liberalization of international economic and political relations, also the dynamic growth of competitiveness of the markets to the stage referred to as hypercompetition. In the nineties the effects of globalization, deregulation and privatization began to emerge, which Richard D'Aveni considers reasons for the total change in the conditions of competition [D'Aveni 1995, pp. 45–57]. The chance for success of an international enterprise has become the adaptation to the requirements of demand in local markets. In this way, the hypothesis of the creation of the global market was falsified. There was an increasing awareness about the growing importance of economic regionalization processes as a phenomenon complementary to globalization. Economic regionalization means growth of significance above all for business relationships between participants of regional economic groupings [Tobolska 2009, p. 145]. Regionalism based on the cultural community and, what follows, the similarity of the pattern of consumption has become a prerequisite for the formation of regional logistics, which e.g. in the framework of the European Union was usually called eurologistics. After 2000, there came the third stage of the development of international business,

which still engaged and deepened processes of economic regionalization, however, accompanied by intense phenomena of relocation of enterprises and competition of existing competitors. Relocation is defined as the transfer of all or part of production to a place providing measurable economic benefits. The causes are usually the availability of space, the cost of acquiring space, the cost of travelling the distance, burden of labour costs, tax burden, price stability, a smaller burden in the field of occupational health and safety and ecology, institutional support, adequate infrastructure, friendly social climate, the industrial culture and working motivation for employees. The result is the separation of the production or processing places of goods from the places of their consumption. [Kostrubiec 2006, pp. 37–41]

Anvil Gupta and Vijay Govindarajan take the view that globalization has developed global transnational corporations, which are characterized by four main dimensions: globalization of market presence, globalization of the capital base, globalization of corporate thinking and globalization of the supply chain [Gupta and Govindarajan 2004, p. 4]. In their view, therefore, one cannot speak about an international enterprise, if it does not have an international supply chain. It is permissible, of course, to differentiate the degree of its internationalization, but at least a minimum should occur.

Finally, the third category of reasons for forming supply networks and chains is the impact of technological progress on logistics processes and their management. In particular, it refers to improving the technical means used in the storage and transport of products, automation process of flows of goods resulting from the integration of machinery and equipment of logistics infrastructure and the information and communication support of managerial logistics decisions. Automation in logistics leads to savings, arising from the replacement of living labour by labour of machines and equipment. Usually, the following are indicated: reducing labour costs, reducing costs associated with maintaining infrastructure, improving control processes and rationalization of transport [*Automatyzacja*]. Information and communication decision support for logistics managers is primarily concerned with the possibilities of electronic data exchange system, i.e. EDI (electronic data interchange). In recent years, additional features of EDI systems arise from the implementation of data exchange using the Internet [Krawczyk 2011, pp. 32–68]. Application of these systems means replacement of paper documents by digital versions, which entails the reduction in costs and the compression of time required to access the information. A factor strengthening the modern supply chain is also telematics. First of all, it allows supervision of the transport means, forwarding and receiving information about the safety of people and cargo, and diagnostics and scheduling logistical repairs [Krawczyk 2011, p. 115]. Finally, the distinguishing feature of modern supply chains is the extensive use of RFID (radio frequency identification). It allows further reducing the cost of acquiring and using knowledge and even greater compression of time for access to information. It also allows and

facilitates the monitoring of movement of goods, identification of manufacturers and allows for more efficient recycling or disposal. RFID technology simply enables wireless transfer of information stored on the often miniature radio tags [Rutkowski 2003, pp. 2–6].

Marianne Jahre and Natalie Fabbe-Costes present the historical evolution of supply chains by periodising it into three stages. The starting point is the decades of the sixties and seventies of the last century, when the companies began the process of optimizing various logistics processes, in particular transport, warehousing, customer service, etc. These efforts led to the increase in efficiency of these processes, but the optimization was of a local nature. This procedure was changed in the eighties, when the managers of enterprises have shifted their attention from isolated logistic processes to the flows of goods. The movement of goods has been the subject of optimization efforts. Attempts were made to increase the efficiency of the flow on the side of supply, within the enterprise and on the side of distribution and final sale. Then, the awareness emerged of the strategic importance of logistics in shaping a company's competitiveness. Optimization, however, was limited by a scope of the decision-making impact of management of a single company. The next step was to seek to optimize both the physical flow of goods and the organization of logistic processes and chain links. Therefore, optimisation of logistics began from local, through intra-organizational to turn into inter-organizational optimisation [Jahre and Fabb-Costes 2005, pp. 144–145]. Complex solving of the problems of physical flow of goods and the organization of the logistics system has enabled inclusion in the scope of the optimization efforts of socio-psychological issues, including issues of trust, knowledge sharing and improvement of qualifications of logistics units' employees.

## 2. Diagnosis and directions of development of logistics management in enterprises

Evaluation of logistics management was made based on the results of empirical research in selected enterprises. The Delphi method applied in research allowed for learning of multiple conditions of use of logistics as a strategy for companies.

The first part of the discussion characterized the five areas of logistics activities, namely:

- 1) principles of operation of logistics in the company, taking into account the directions of export and import of goods;
- 2) logistics organization in the structure of strategic management of the company;
- 3) the basics of creating supply chain and supply network in the company;
- 4) assessment of the operational function of logistics management, including transportation and storage;

5) determining the directions of development of logistics in the international company.

The second part of the discussion demonstrates, for comparison, the results of empirical research in Polish companies shortly before the Polish accession to the European Union and after the accession of our country to the EU. Importantly, the results obtained in the 2000s and in the years 2015–2020 refer to companies of Wielkopolska region. This allows a wide temporal context in this analysis, as well as capturing the dynamics of changes in this respect. It should be added that empirical research on logistics management in companies is difficult due to the fact that enterprises build their own logistics systems, treating them as important factors of competitive advantage and, consequently, they keep their projects confidential.

Hence, the acquisition of valuable source data is a value not only for the present considerations, but also for management of companies, building and developing logistics systems at the global level. They also hold significant educational value for future managers, logisticians who are or will be responsible for the future of logistics in enterprises.

As already mentioned, selected companies participated in the study conducted in 2015, and the time span covered the years 2012–2014 and 2015–2020. Core activities of surveyed companies are: industrial production, manufacturing, automotive sector, wholesale trade, construction, water supply and sewage management.

Most companies, namely 80% are transnational, others are national and regional companies. Only one company is a state-private enterprise and the rest are private. Of the surveyed companies, seven are limited liability companies, and three companies are joint stock companies. All companies have their share of foreign capital. Number of employees in the companies is divided into 4 groups: two companies employ less than 50 people, two companies employ between 50 and 249 people, three companies employ from 250 to 999 people and three companies employ 1000 to 5000 and above 5000 people.

The scale of business activity is evidenced by trends in exports and imports. The activity of enterprises in this scope increased steadily in 2012–2014 and will continue to grow, especially in those companies which declare a significant increase in investment for transport and storage in 2015–2020.

In recent years the level of exports to countries outside the EU has increased steadily, which stimulated the companies to significant changes in the modernization of logistics management.

A very important issue for the rationalization of logistics tasks is to organize the logistics in the structure of strategic company management. The fact that as many as 4 international companies have divisions of logistics, managed by a vice-president of the company, should be highly appreciated. This means the ongoing participation of the vice-president for logistics in building and shaping the principles of strategic management in the company. Above all, however, the operation



of the logistics division is equivalent to including it in the company's strategy, and thus the strategic management of the company. In the subsequent five companies, the logistics activities are handled by the Logistics Department, which, along with the development of operational or financial function of logistics management, will transform into the logistics division. Only one company, employing up to 249 people has the position of logistics manager, which gives rise to the Logistics Section.

The presented organization of logistics is very similar to the solutions applied in EU countries, which allows us to see the path to obliterating the differences in terms of logistics activities.

A company, as a link in the supply chain, must – as we know – work closely with partners as other links of the chain. Therefore, the study included such important factors, determining the rational cooperation with partners in the supply chain, as: types of construction of supply chains, strategic and operational supply chain management, the use of long-term and short-term agreements, arranged, joint investment trends and the desire to integrate management systems in terms of IT.

As is clear from the research concerning the functioning of simple and extended supply chains and supply networks in companies, the vast majority, eight companies not only have an extended supply chain, but also a supply network. Moreover, these eight companies apply both strategic and operational logistics management. It should also be emphasised that the surveyed companies reduce or even forgo long-term contracts with partners in favour of the short-term ones, concluded for up to three years on average. An upward trend characterizes preferences of multinational companies to agree with partners on common directions of investment in the improvement of collaboration with the cooperators, and joint research and development projects. In addition, all surveyed companies attach great significance to the systematic implementation of on-time delivery.

The development of IT integration of the management systems of partner companies in the supply chain is of somewhat less interest for four companies. There are at least two reasons for this state of affairs. The first of these is the lack of EDI system (paperless document cycle) in the company, which practically makes it difficult, if not impossible, to exchange information. Regardless of this, the latest IT systems are highly cost-intensive and, according to managers, not quite profitable. The second reason arises from fear of incurring risks, especially with regard to the transfer of information sensitive for the company, which can be used in order to eliminate competition. Among the systems listed in the questionnaire<sup>2</sup>, the most

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<sup>2</sup> SAP – process planning (Systems, Applications & Products), MRP – inventory planning and management in production (Manufacturing Resource Planning); GPP – preparation of the production schedule (Gross Primary Production); BOM – list of materials (Bill of Materials); MES – Manufacturing Execution System; WMI – recipient inventory management (Vendor Managed Inventory); WMS – traffic management of inventory in warehouses (Warehouse Management System); SOP – sales

commonly used in companies are: SAP, MRP, GPP, BOM, MES, WMI, WMS, SOP, SCM, MPS, BOM.

As part of the operational function of logistics management, transport and storage tasks play the major role, due to the costs involved and service time, so important to the success of the company. As it turns out all the surveyed companies use outsourcing for the transport in handling their customers. Furthermore, eight companies have their own logistics centres or own warehouses. In this sense, own centre or warehouse mean excellent modal points of logistics network. Logistics centres are systematically modernized, equipped with modern equipment, which in many cases enables 24-hour logistical service and is an efficient point of dispatch and receipt of goods.

It should be emphasized that this type of logistics service is also evidenced by the structure of logistics costs in multinationals. And so, the average costs of transport is 44.5% of the total logistics costs, storage costs is 43.7%, and other costs is 11.8% of total costs. In this context, we examined the size of investment in transport and storage in seven companies, which allowed us to divide them into groups such as: two companies will invest up to 0.5 million in the years 2015–2020, one company will invest between 0.5 and 1 million every year in 2015–2020 and four companies – 10–20 million in 2015–2020, and more than 20 million after the year 2020.

Planning for systematic investment size for transport and storage proves a remarkably positive tendency to expand own logistics centres or own warehouses. This is due, among others, to the fact that Poland does not yet have functioning general access logistics centres of up to 400–500 hectares, located around large cities at the intersection of transport routes.

Based on the results of empirical research, we can assess very positively and highly the logistics activities of multinational companies in Wielkopolska, at least for three main reasons. There has been a significant increase in the number of logistics divisions, managed by a vice-president, as well as an increase in the construction of extended supply chains and supply networks. As a result, an increasing number of companies use – in addition to the operational – also strategic logistics management. More and more often arrangements are implemented on the division of the risk level of costs and benefits between the supply chain links. There is also not only a response to changes in demand, but also recognition of trends in reported customer needs. The logistics activities systematically increase on-time delivery, and there is a high tendency to collective investment, for example in information technology and logistics centres.

In support of such conclusions, these deliberations will present the results of empirical research in the period preceding 2004, the year in which Poland joined

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plan (Sales & Operations Planning); SCM – Supply Chain Management, MPS – Master Production Schedule.

the European Union and after the accession of our country to the EU in 2005–2010. The results of research conducted previously will be presented in the same substantive scope as before and will refer to:

- 1) principles of operation of logistics in the company, taking into account the directions of export and import;
- 2) logistics organization in the structure of strategic management of the company;
- 3) the basics of creating supply chains and supply networks in the company;
- 4) assessment of the operational function of logistics management, including transportation and storage.

The first empirical studies were conducted [Gołemska, Kempny and Witkowski 2005, p. 50] in 2003 and concerned the diagnosis of logistics operations in companies and planning development of such activities in 2000–2004. These studies included 145 enterprises from all 31 counties of Wielkopolska, operating in sectors such as industrial production, trade, services, automotive industry, construction, transport, food industry. The companies were state-private, mostly private with small share of foreign capital of up to 25%. In the studied years, between 67.5 and 81.4% of exports were directed to the EU, as well as Russia and Ukraine. The major import sources included: USA, Australia, Japan, China, Brazil.

The second study was performed in 2005 in the SME sector companies which received funding from the EU for their development. The study involved 101 companies from Wielkopolska, mainly private companies, with 10–15% of foreign capital.

Finally, the third empirical study conducted in 2009 [Brauer 2012, p. 181] was based on the fact that the direct survey questionnaire was sent to the same 145 companies in Wielkopolska region. This time the source data were received from 98 companies, which experienced significant beneficial changes in logistics activities.

The study results, in the context of the discussion on the functioning of logistics in multinationals, clearly indicate, moreover, that compared to 2015 in the 2000–2014 period, there was a systematic development of logistics in companies both in terms of the share of foreign capital in enterprises and forms of ownership of companies and increasing the number of directions for exports and imports. Development of activity in terms of building relationships in the supply chains made it possible not only to reach new markets but also systematically increase the core competencies of international businesses.

With regard to the organization of logistics in the structure of logistics management, the period 2000–2015 also saw big changes. And thus, in 2003, the place of logistics in the management structure was represented as follows: 60.3% operated a Logistics Department, in 32.7% the logistics positions existed, created mainly in the Departments of Procurement and Production and the Storage and Stocks Departments, 4.8% had Logistics Sections and 3.0% operated logistics divisions, mainly in branches or subsidiaries of multinational companies.

On the other hand, according to study results from 2005 in the SME sector, the organization of logistics in the company was as follows: 22% had a Department of Logistics, 11% Logistics Section and in 13%, there was no organization of logistics management.

In 2009 the results of the research made it possible to draw conclusions regarding the significant reconstruction of the logistics organization in the company. First of all, logistics management in the individual departments of the company, for example supply or production departments, was abandoned. Instead of such a method of management, logistics sections were created, and the number of logistics divisions and Logistics Departments was increased. Hence, in 2009, the structure of logistics organization was as follows: 75% managed logistics in the Logistics Departments, 15% had Logistics Sections and 10% managed logistics in the logistics divisions.

A remarkable dynamism in the reorganization of logistics management was mainly caused by the development of the said internationalization of enterprises. The process of companies opening to the outside in the direction of international cooperation caused the transfer of responsibility from middle management to the highest director's management level. Consequently, a change of emphasis in the formulation of strategic objectives and therefore making strategic decisions followed with the development of forms of coordination. And that meant a shift from transactions to cooperation in the entire supply chains. The process was completed in 2010 and gave rise to the integration of links in the supply chain.

Basics of creating supply chain underwent significant changes in the period 2000–2015. These changes resulted not only from changes in the directions of exports and imports, but above all, the quality of building relationships between partners, joint investments and integration of IT systems.

In 2003, the companies began to create supply chains of a fairly uniform character, boiling down to the relationship with the supplier and recipient of products or services. Such chains are called simple, due to their relatively uncomplicated structure.

In 2005, interestingly, the SME sector expanded part of these chains, particularly in the manufacturing and trade sectors and they took the form of extended chains.

In turn, in 2009, according to the study, simple chains spontaneously disappeared or turned into extended supply chains. During this period, the supply networks also started to form, first in the pharmaceutical industry and the food industry. Initially in the 2000s, such IT support methods were used in supply chain management as: KAN-BAN, controlling inventory in manufacturing, JIT – on-time delivery (just-in-time), ECR – cooperation with the customer (Efficient Consumer Response) or the previously mentioned MRP and DRP – distribution control (Distribution Requirements Planning). Currently, the range of IT tools is very comprehensive, and they also apply artificial intelligence.

Assessment of operational function of logistics management, concerning the results of empirical research in the years 2003, 2005 and 2009, for the purpose of

comparison to 2015, was carried out mainly in respect of the activities of transport, storage and handling of stocks. And so, in 2003, the structure of logistics costs was as follows: transport costs was 37.2%, storage costs – 28.8%, the cost of the procurement process – 26.7%, it should be added that in the early 2000s the logistics costs included purchases of materials and finished products generated by the Purchasing Department, and the costs of administration is 7.3%.

Moreover, in 2003, investments were planned for the development of the logistics with the following structure: 45% for the purchase of modern information technology, and the rest of the funds – for the construction and modernization of storage facilities, i.e. 32% and transport – 23%.

On the other hand, in the SME sector, the companies surveyed in 2005 planned investments of the following structure: 60% for the expansion and modernization of storage facilities and means of transport, 21% for the modernization of production and 19% for the purchase of computers and information systems. In 2009 – according to the research – the structure of expenditures for the development of logistics activities changed and it was as follows: expenditures for computer software – 20% of funds, for storage – 48% and transport – 32%.

Comparison of the results of empirical research conducted by Delphi method in 2015 with the results of the years 2003, 2005 and 2009 aimed at showing the quality and efficiency of logistics development in the company's strategy. The evaluation used the data from the business practice which – presumably – are proof of the pace, type and nature of changes in the logistics management of international enterprises.

There is no doubt that the scope of the individual areas of management, determined by the number of the components of this management is very broad and always open. It must be kept in mind, however, that in this kind of source data, difficult to come by for a researcher, one should mark and apply those which are critical points in the whole area of research. Therefore, the purpose of such research was not only the emphasis on the most important tasks of logistics, but also showing the way for the achievement of the competitive advantage and increasing market share, in the broad context of modern logistics management in an international company.

### 3. The impact of logistics policy of the European Union on the evolution of logistics management in enterprises

This discussion attempts to answer the question of how to implement EU logistics policies in enterprises, especially international ones. In order to find answers to such a question, three initial assumptions were adopted in determining the substantive scope of these considerations:

- the first assumption amounts to stating that the place of logistics policy in the economic policy of the EU is synergistic, and this is due to the fact that one policy affects the other;
- the second assumption – growing potential of logistics in an international company has a significant impact on the size and structure of exports and imports within the EU [Nalewska-Twardowska 2015, p. 166];
- the third assumption was established on the basis of diagnosis [Ruston and Walker 2007, p. 46] of logistics activities in an international company, according to which 73% of this activity is the “logistics in house,” and only 27% outside the company, in the form of outsourcing, which implies that it is the companies that are responsible for the appropriate level of logistics of goods and services.

The reason why it was decided to include attempts to explore the essence of the relationship between the place of logistics in management strategy of international business in these considerations is the expansion of logistics policy in the economic policy of the EU. This phenomenon has a direct impact on those elements of strategic company management which have a decisive influence on obtaining competitive advantage. Moreover, on the basis of empirical research, we can conclude that logistics in the “old” EU-15 has matured from the beginning of the twenty-first century, along with the European Union. In the first years of this century, the focus of the activities of the European Communities Commission gradually moved from transportation to logistics, because it was considered necessary to create the conditions for sustainable development. It is worth recalling that in 2001, the so-called White Book released a record, according to which only the high quality of logistics management can be a catalyst between knowledge, skills and the size and structure of jobs. In 2006, works began on a broad legislative process by stating that the logistics activities in Europe are essential to both maintaining and enhancing the competitive advantage, according to the Renewed Lisbon Strategy. As part of the valuable and important, and above all, broad legislative process concerning the necessity of creating a legal framework for logistics in Europe, such initiatives were created as [Komisja 2006, p. 336]:

- The Union of Baltic Cities established the Logistics Task Force in 2006 to determine the scope of transnational actions by these cities in relation to maritime logistics and transport;
- also in 2006, at the initiative of the Finnish Presidency of the EU, EULOC platform was designed by the logistics experts. It was then decided that the main areas of the new vision of logistics in the 21<sup>st</sup> century shall include:
  - development of logistics in transnational corporations,
  - construction of new business models,
  - risk sharing in the supply chain,
  - construction of eco-logistics systems,
  - security;

- in 2007, Germany established a special plan for the development of logistics, referred to as Freight Transport and Logistics Master Plan. It aimed to harmonize, at European level, the important standards for interoperability in transport and logistics and, consequently, high availability of logistics infrastructure.

The sum of all development initiatives was so significant that finally, in 2008, the European Logistics Action Plan was launched for implementation. At the same time, in art. 35 and 37, the European Union committed itself to the fact that national action plans of the members for the development of transport and logistics would be integrated into the overall development plan of the EU.

At this point, we come to the crux of the discussion, namely to justification of the need to implement important elements of logistics policy in the strategies of international business management. The question then arises, how and with what methods one should implement logistics management in a strategy of a multinational enterprise. First, presumably, one needs to define strategic and operational objectives of both the company and logistics, implemented in the course of its activity.

The discussion begins with the characterization of the most important paradigms of logistics policies, which should be taken into account in determining the strategic and operational objectives, built in the framework of the international business management strategy. We believe that in terms of thus constructed paradigms, one needs to create a thought mechanism to enable setting common strategic and operational objectives for both logistics management and international business management.

It must be emphasized that the requirement to build paradigms is their significant conceptual generalization, which in turn allows the determination of a wide range of views, definitions, and theses (Table 1). In the context of the so-formulated paradigms, one must therefore reflect on how much strategic and operational objectives of the common enterprise management through long-term or short-term goals can be achieved and at what cost. And so, on the basis of the results of empirical research, one can point to several possible interferences on the way to the implementation of the adopted objectives of the activities of an international company. One of them is the paradox inherent in the relationship between quality and the cost of production or distribution of goods and services. The flagship objective of logistics is high, constantly optimized quality of customer service. At the same time one cannot implement continuous improvement of this quality without increasing the cost of this service.

Consequently, there is a conflict between e.g. Department of Logistics and Sales Department, and even the Department of Finance. Another threat to the joint implementation of strategic and operational objectives may be a different reaction of these departments to the need to carry out the investments necessary for the quality of customer service in the enterprise.

Table 1. Paradigms of European logistics policy

Paradigm	Detailing the essence of the paradigm
1. Identification of needs reported in the market	Logistics policy should stimulate the expected level of identification of needs
2. Creating creative attitude in management	Entities of logistics policy should focus their creative attitude in order to acquire key competences
3. Autonomy of enterprises – supply chain links	It consists in the free building of its own strategy, independent from other companies
4. Environmental protection	Is due to the need to protect and prevent environmental degradation

Logistics operations, especially in large companies, are expenditure-intensive and cost-intensive, and therefore must be the subject of negotiations on the diverse needs in this regard. Often, this requires creative imagination from managers. This primarily concerns logistics infrastructure, including costly equipment of storage bases. Furthermore, the classic feature of any infrastructure, whether economic, including transport, logistics, or social – schools, hospitals, etc., is keeping a throughput greater than current needs. Hence, planning the construction of new roads, ports and storage depots, we refer not to the current demand, but the future one, in the perspective of at least 5 years.

It should be hoped that the current and future techniques and methods of strategic management in an international company require solutions that will allow for the elimination of losses resulting from any discrepancies in the implementation of strategic and operational objectives of the company.

Therefore, on the basis of the latest literature and empirical research, a framework scheme to build common strategic and operational objectives was developed (Table 2). The operational objectives of logistics management and business management are – for obvious reasons – a consequence of the general principles contained in the strategic objectives. As can be guessed, the objective and material scope of operational objectives in the enterprise is very broad, and therefore only the most important of them are presented (Table 3). Achieving competitive advantage through the implementation of joint strategic and operational objectives in logistics management is substantially associated with the second assumption presented above, which was adopted in this discussion, as it relates to the growing potential of logistics service in multinationals. As is clear from the latest empirical research conducted in the countries of “old” and “new” EU [Nalewska-Twardowska 2015, p. 166] a very interesting phenomenon was observed, consisting in the fact that the dynamics of the share of both import and export was higher in the countries of the new EU members than in the “old” EU countries.

Similarly, in the case of exports, increase in the share of exports of new countries surpassed this development in the countries of “old” EU. What does it mean? The



biggest mobilization in international exchange was associated with a large increase in the significance of logistics, which was often the basis for the effectiveness of the exchange of goods and services.

Table 2. The strategic objectives of logistics management and business management

Logistics management	Business management
1. High level of competitiveness of the logistics activities	1. High level of competitiveness of production and sales of goods and services
2. Availability of foreign markets supported logistically	2. Choosing an entry strategy to foreign markets
3. Availability of transport infrastructure	3. The choice of location methods for production and distillation

Table 3. Operational objectives in the logistics management and business management

Logistics management	Business management
1. Calculation of the cost of logistics, target costing method	1. Analysis of the share of logistics costs in total operating costs
2. Innovativeness of purchases of equipment and intelligent software for logistics support	2. Application of methods of assessing the purchasing efficiency using NPV and IRR methods
3. Analysis of the frequency and timeliness of supply, measured by the level of customer service	3. Analysis of the cost of losses and over-normative shortages

Due to locating foreign direct investment in the countries of Central and Eastern Europe, not only new business partners, but also new markets were acquired as part of bringing the latest logistics techniques and technologies. Moreover, the acceleration of economic development resulted in innovation greater than in the “old” EU, both in terms of the purchase of transportation and storage equipment, and information technology. Logistics operators in these countries were able to offer lower prices of logistics services, due to lower labour costs. In the new EU member countries, after 2004, the concept of cost advantage emerged within the logistics activities [Rushton, Croucher and Baker 2010, p. 27]. The authors argue that the cost leadership, leading to the competitive advantage used in logistics involves:

- reducing the costs of transport, storage and handling of inventory;
- reducing the number of distribution channels;
- reducing the total cost of logistics.

Regardless of the functioning in the European countries of the phenomenon of low-cost leader in logistics and low cost leader, over the years, the level of logistics costs will approach the other “old” EU countries. Therefore, to maintain a competitive advantage in international companies, it is essential to seek to restructure competitive logistics strategies that will be used in the logistics management in an

international company. In this situation, the transition from logistics transactions to strategic alliances is inevitable.

The strategic choice of forms of logistics services is associated with the third and final assumption adopted in this discussion as important for the determination of rules of implementation of important elements of the logistics policy of the EU in international companies. In this case it regards, of course, the traditional strategic choice, referred to as “make or buy,” or: organize logistics operations in the company yourself or use the service of logistics providers in an international company. A simpler solution to this is, of course, economic calculation, which unambiguously enables making a decision in this regard.

It turns out, however, that 27% of companies in the European countries use outsourcing. One should therefore ask the question of why companies choose their own logistics activities? Europe is currently supported by large, good and well-known companies such as: Raben, Küne und Nagel Schenker or FM Logistics. At the same time many European companies, including of course Polish ones, for example Atlas, build their own transport fleet, whose advantages are well-known. The main advantages of own fleet are based on the fact that the company brand is disseminated, advertised by putting the company name on vehicles on the road. In addition, having own fleet is related to the provision of 24-hour readiness to implement logistics services.

In this situation, strategic logistics decisions converge with the company’s strategy, which consequently must always decide in the context of the conditions necessary to gain competitive advantage.

The considerations concerning the logistics management in an international company are the starting point to coordinating the logistics as supply chain management with the strategy of the company, in order to gain and maintain competitive advantage. Further research in this area should be carried out in the direction of both synchronization and synergies of international business management strategies, so crucial for the global economy.

## Concluding remarks

As a result of the foregoing discussion, both in the context of the recent literature and empirical research on the diagnosis of the operation of international logistics in the years 2000–2015 and its forecasts for 2020, one can draw the following conclusions:

- evolution of international management of supply networks and chains makes it possible to develop sustainable competitive advantage and even a flexible

response to the emergence of more and more new potential sources of that advantage;

- Delphi method used in empirical studies, serving both the diagnosis and prognosis of development of international logistics in transnational corporations, allowed the high evaluation of its functioning in most industries and economic sectors in Poland;
- it was further stated that the strategic logistics decisions coincide with the strategy of an international company, which means that modern international logistics is the strategy of the company.

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## Production and transport management in the sustainable supply chain development

### The development of supply chains – an introduction

Observing the functioning of supply chains in the economy, one can easily notice changes in the implemented strategies and methods of operation. They are noticeable not only from the perspective of a long term, but also in terms of current observation. The supply chains adjusting to the changing realities of the action occurs smoothly and has a permanent character. And realities of supply chains operation are changing under the influence of a number of reasons. Some of them are the result of changes on the product side, which is delivered to the market, changes in the scope of its purpose (liquidity of the boundaries of industries), some a result of changes in the requirements of the customers on how to deliver a product, and some simply result from a variety of ad hoc problems faced by enterprises constituting a supply chain.

Supply chains must adapt to change and the ability must be continuous. Therefore, previously established indicators of the efficiency of supply chains, such as level of service, time and cost have lost their significance. Getting good results in this regard does not guarantee an advantage over others anymore. Even as early as several years ago it was pointed out that it was time to change the most important criteria for the efficiency of supply chains and the set of new criteria was stated as follows [A.T. Kearney and ELA 1999]:

- ability to respond quickly,
- ability to optimize the use of resources,
- and high flexibility.

Their impact on the management of the supply chain is reflected in the 3V principle, the acronym of which is made up of the first letters of words for features that should characterize a supply chain, namely [Ruhi and Turel 2005]:

- visibility, referring to the possibility of resource location;

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- velocity, understood as the ability to dispose of them, and so consequently denoting the ability to meet the current needs of customers;
- versatility, which focuses on the ability to simultaneously satisfy different needs of different customers.

All these features are dependent on the ability to coordinate relations between entities operating in the supply chain and skills to prevent disruption of supply chain processes and the loss of continuity in the face of all kinds of situations. 3V formula shows that supply chains should be created with increasing awareness, and their management should take into account the added value for all stakeholders.

It is not difficult to guess that the achievement of satisfactory results in the scope of 3V raises the importance of information and communication technologies used in supply chains. Traditional data processing models, together with the existing tools of analysis must be abandoned as insufficient and replaced with new ones with greater potential for integrating functions and processes, and greater flexibility and speed. Running a business in a dynamic market, in conditions of unstable competitive advantage requires of managers rapid analysis of large data sets. This requires data processing in real time. Such large sets of data are generated and currently available, as nowadays almost every aspect related to the flow of resources in the supply chain is recorded. Skilful use of large and diverse data sets can lead to making more accurate decisions, if information value can be generated from them during processing. For that, proper analytical tools are required. Success consists in the conversion of large amounts of data into an unprecedented quality of management information. These large data sets should not remain unused. These new tools for analysis of large data sets are illustratively called big data. Therefore, at this point it seems reasonable to recall yet another principle, which in the area of the sphere of (management) regulation complements the 3V principle relating to the real sphere (flows of material resources) of the functioning of supply chains. Namely the 4V principle [Iafrate 2015], and even 5V [Tole 2013], which characterizes big data and indicates:

- the amount of data (volume),
- its diversity (variety),
- the rate at which it is generated (velocity),
- reliability in describing reality (veracity),
- and the value that can be obtained from data (value).

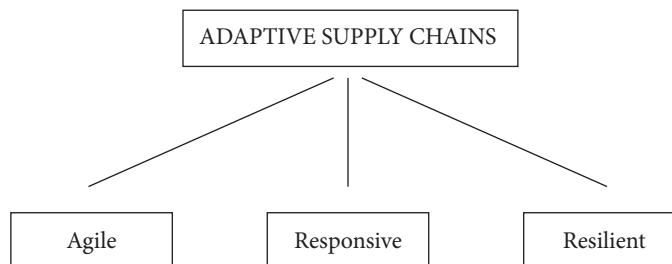
Standing out within the parameters of the 3V formula and the ability to use features of the data stream and resources specified by 5V formula in management is a pillar of adaptive supply chains. Adaptability is created by using structural and functional reserves, rearrangement of resources and better coordination of actions resulting from the large-scale use of information and communication technologies, particularly the Internet. One cannot disregard also the issue of revision and restructuring of business processes. This is a more radical action, but as practice shows, often necessary. The studies reveal that as many as one-third of the processes

in the supply chain may be inadequately designed and / or implemented (inadequate) [Dixon 2015]. What's interesting – Europe and North America appear to lag behind the rest of the world when it comes to process maturity. The suspicion is that it is the result of relocation of manufacturing processes to new markets, which loosened the process discipline in the existing markets [Dixon 2015]. Adaptability can be determined as the current development megatrend of modern supply chains.

As part of this megatrend, current, freshly observed changes in the functioning of the supply chains are difficult to analyse in terms of inference on the directions of the development of supply chains. However, looking in retrospect allows for the inference on the main directions of development, as they have become entrenched in business practice. An attempt has already been made at determining them, taking as a criterion a clear target in form of the effect of the changes made in the operation of supply chains [Szymczak 2015]. They have the character of some developmental meta-directions (figure) and express the drive of supply chains towards:

- flexibility and agility in action (agile),
- sensitivity to the needs of the customer (responsive),
- resistance to disturbance (resilient).

Within these three general trends, a variety of approaches is observed, along with different strategies and wealth of supporting solutions in terms of organization, process, technology.



Meta-directions of development of supply chains

It might be stated that in the face of the requirements of the environment in which modern supply chains operate, development in each of these directions at the same time is desirable. These actions support the idea of sustainable development of supply chains (sustainable supply chain). A sustainable supply chain takes into account all stakeholders, not just customers. The issues of environmental protection, understood very broadly, are crucial, and equally include the natural, human, economic and technical environment, such as: conservation, reuse of raw materials, working conditions and hours, respect for human rights, adherence to health and safety rules, limiting corruption, elimination of sabotage and vandalism. Thus, here we have the integration of multiple dimensions of activity and policy in relation

to the natural and social issues [Linton, Klassen and Jayaraman 2007]. Therefore, sustainable supply chain management means the need to take into account more aspects, define a broader spectrum of goals, include a larger number of entities operating in the supply chain and, above all, more cooperation between them [Seuring and Müller 2008]. But building a sustainable supply chain must start at the stage of the formation of the supply chain, at the time of construction of its business model, at the stage of product design, scoping activities, the choice of location for the conduct of an activity or choice of suppliers and contracting customers. All these decisions have important consequences on the side of processes performed in the supply chain and their impact on the so-defined environment in which the supply chain operates. On the other hand, sustainable supply chain management goes beyond its core tasks and must also apply to what happens after the transfer of the product to the final customer. It must take into account the by-products generated in the process of product manufacture and use, as well as residues of produced, sold, and used products. This means the need for their management (especially processing or reuse), and taking action to extend the period of use of the product, which translates into lower weight of the problem of by-products and residues, as well as smaller scale of related activities [Linton, Klassen and Jayaraman 2007]. Attention to these issues is drawn by the concept of closed-loop supply chains [Guide and Van Wassenhove 2002] which is part of the idea of sustainable supply chains. Within supply-chain management, a closed-loop model has been identified as one of the key elements of sustainability [Sundarakani et al. 2010]. A closed-loop business model includes upfront design of products that can be manufactured by means of materials reclaimed throughout the manufacturing process and at the end of a product's life [Valkokari et al. 2014].

The functioning of a sustainable supply chain is based on a balanced approach to its functional components. One cannot imagine a sustainable supply chain without sustainable production and transport. The legitimacy of the special distinction of these two areas is due to the role of production link in the supply chain as a link initiating its operation and integrating the sphere of supply actions with the sphere of distribution actions, and the role of transport responsible for the connection of various activities with a network of physical flows of resources.

## 1. Sustainable development of manufacturers

Sustainable development may be considered from many different viewpoints. Because of that understanding of the term "sustainability" varies significantly even from one manufacturer to the next. Some manufacturers consider sustainability to be mere compliance with environmental legislation, others see it as involving



waste and cost reduction or reduction of emissions, and still others think of it in terms of workplaces and community engagement [Bonini, Gorner and Jones 2010]. As a result sustainability may be driven by the need for regulatory compliance, cost savings through eco-efficiency, corporate social initiatives and satisfaction of customer demand [Valkokari et al. 2014]. It may be also driven by conscious customers, who prefer sustainable products.

But in the same time sustainability is one of the most critical issues facing manufacturers today. With the ubiquitous threat posed by low-labour-cost countries, exacerbated by the mass customisation requirements of a more consumer conscious society, it is becoming increasingly difficult for manufacturers in the western countries to remain competitive [Pham and Thomas 2012]. With the demand and supply profile changing, manufacturers must now operate in a more complex environment forcing their supply chain strategies to follow a wider range of environmental requirements and regulations. Most governments and many social organizations put emphasis on reduction of wastes and pollutions. As a result, manufacturers are facing increased pressure on reducing the level of waste produced, CO<sub>2</sub> emissions, sulphur and lead compounds and other pollutions. The reasons for this approach are clear. Manufacturing sector has a huge impact on the key aspects of sustainability. Besides a great impact on resources consumption and emissions to the environment, the manufacturing sector is responsible for 33 per cent of energy-consumption and 38 per cent of total direct and indirect CO<sub>2</sub> emissions [Valkokari et al. 2014]. Because of that manufacturing models, which were based on the old paradigm of unlimited resources and unlimited capacity for regeneration, need to be updated [Garetti and Taisch 2012]. All these factors have influenced on changing of companies' perception about sustainability. For many companies sustainability remains at the level of PR only, but on the other hand many others start to see the potential for supporting corporate reputation and social responsibility connected with good corporate governance. It has become the goal for many enterprises to promote manufacturing processes and products that minimise environmental impacts while maintaining social and economic benefits [Joung et al. 2012]. Manufacturers also emphasise sustainability by reduction of resources and energy consumption, decreasing waste amount, reusing and remanufacturing. Issues on 3R (*reduce, reuse and recycle*) can be seen as a way forward for many industries to achieve sustainable development on the various environmental, social and economic levels [Hamid and Kamar 2012]. Manufacturers are also concerned with seeking more sustainable materials to meet the growing demand for sustainable products and services [Bonini and Gorner 2011]. It may give benefits in cutting costs. For manufacturing companies, development towards sustainability can bring new means of differentiation, new business opportunities that support manufacturers in finding new possibilities of pursuing opportunities provided by new rules [Valkokari et al. 2014]. The development of a sustainability strategy

enables companies to identify the key requirements which emerge as a result of analysing existing product portfolio, new product development directions, economic and environmental factors [Pham and Thomas 2012]. The benefits provided by this new approach enable companies to apply chosen principles to new business opportunities when they arise. However, this requires action at both operational and strategic levels. Sustainable development requires both changes in internal structures and external collaboration [Stubbs and Cocklin 2008].

On the operational level manufacturers which want to remain competitive develop and implement sustainable manufacturing tools and techniques like optimization of production systems, complying with environmental laws and regulations [Zhang and Haapala 2012]. The introduction and adoption of whole life cycle costing model (WLCC) and green procurement is another example [Hamid and Kamar 2012]. The sustainability idea has created a need for establishing a waste minimisation strategy to meet current manufacturing trend. Many manufacturers use lean (set of management principles and techniques geared towards eliminating waste in the manufacturing process which encourages doing more with less: less space, less raw material, less energy, etc.) and agile approach which provide for greater manufacturing capacity, lower unit costs and greater responsiveness [Pham and Thomas 2012]. The implementation of lean usually concentrates on the tools and techniques aimed at reducing waste in the system and maximisation of material – and energy-efficiency; reduction in costs, waste, emissions, and pollution [Valkokari et al. 2014]. Agility approach promotes the need to be responsive and flexible to customer requirements and use only these resources which in fact are necessary, in amount which is really needed. It also gives quick changeovers and time compression possibilities. Company which uses this approach may quickly and easily adjust its core manufacturing capabilities to meet new environmental regulations.

There are many other solutions connected with the implementation of sustainability along a supply chain. Transparency and external collaboration may be treated as model issues in case of supply-chain management for sustainable development [Wognum et al. 2011]. If appropriately managed, transparency can improve the effectiveness of supply chain. In this context two areas were identified as relevant drivers for the potential development with respect to sustainability [Garetti and Taisch 2012]:

- multi-stage inventory management, aimed at reaching harmonised logistics and optimal supply-chain inventory levels,
- collaborative planning and management of production and logistics.

To reach sustainability goals, companies use this approach and have begun to integrate supply-chain members to be more efficient along the whole supply chain (for example, the sustainability approaches were used by Nike or Puma) [Valkokari et al. 2014].

Another more advanced action is a change of emphasis in the whole structure of the supply chain. Considering the migration of profit streams from manufacturing

to services sectors, Martinez et al. [2010] argue that manufacturing organizations need to change their strategic perspective towards becoming “product-service” providers rather than simply product manufacturers. The use of product-service system is also named servitization [Baines et al. 2009]. It shifts the business focus from designing and selling only physical products, “to selling a system of products and services”, which could have potential sustainability benefits to better internalise the negative environmental and social externalities (such as carbon emissions, resource depletion and waste generation) associated with product manufacture, ownership and use [Manzini and Vezzoli 2002; Tukker and Tischner 2006]. Xerox photocopiers and InterfaceFLOR are examples of this approach [Valkokari et al. 2014]. Several other global companies such as Caterpillar, Rolls-Royce, and MAN Trucks have adopted this strategy to better position themselves [Soosay et al. 2016]. Companies need to consider these trends when formulating their manufacturing strategy for developing leadership or simply in order to survive [Soosay et al. 2016]. This approach may generate positive environmental and social value while making a business case for sustainability [Lüdeke-Freund 2010; Schaltegger, Lüdeke-Freund and Hausen 2012; Meier, Roy and Seliger 2010]. Servitization is also considered as a viable path to reduce environmental impact of products [Tukker 2004].

Another question is connected with changes of supply chain structure. In the past, the classical framework for supply chain management considered conventional material flows from pre-manufacturing to use stages along the supply chain towards consumers or end-users [Kuik, Nagalingam and Amer 2011]. In a traditional manufacturing structure, supplier, lead producer (product company or original equipment manufacturer), distributor and customer could be defined as the most typical roles in the supply chain [Dao, Langella and Carbo 2011]. Globalisation and the consequent dispersal of manufacturing activity has increased complexity and ambiguity of manufacturing structure. Since the 1990s the traditional pattern has been changing, and the theoretical discussion has emphasised the shift from supply chains to supply networks [Peppard and Rylander 2006]. Manufacturers have begun to relocate their manufacturing facilities and their distribution centres creating supply networks. Nowadays these networks play a vital role particularly in the automotive, electronics and in the fashion industry. Moreover lead producers have started to outsource manufacturing and their suppliers try to increase services (add later links in the chain and abandon some earlier ones) [Valkokari et al. 2014]. Suppliers have begun to provide not only raw materials and finished products but also transportation, energy, packaging, design and recycling services. It has become difficult to categorise companies as manufacturers, lead producers or product companies as the importance and complexity of service business increases [Baines et al. 2009].

While location choices have gained higher importance due to globalisation, offshoring, and reshoring trends [Walters 2014], they are accompanied by environmental sustainability pressures for manufacturing strategy [Pham and Thomas 2011].

Supply-network design for (re)location plants force the evaluation of the characteristics of products and services, the transportation time and costs and the ecological issues [Valkokari et al. 2014]. Global production networks tend to increase the energy intensity and carbon emission for some products, pushing global companies to develop and transfer green practices in their manufacturing networks [Soosay et al. 2016]. This is particularly important for sustainability. The amount of environmental impact from material transportation activities to be one-third of total environmental impact of industry [Hamid and Kamar 2012].

## 2. Future demand for transport and its consequences

The search for new markets and, above all, the search for locations allowing for cost reduction, mainly labour cost, at low and decreasing transport costs meant that in the last roughly 20 years there has been a significant increase in the area of the functioning of many supply chains. Locating production facilities mainly in China, and now also in other countries of South-East Asia made the finished products as well as raw materials and components for their production travel much greater distances on the way to the final customers than before. At the same time, growth of world population and its purchasing power make the transport demand grow steadily. Numerous forecasts indicate that this trend will be maintained at least by mid twenty-first century. The calculations of the OECD and the ITF experts [2015] show that between 2010 and 2050 the demand for land cargo transport (calculated by transport performance in tonne-km) in the world according to different scenarios will increase in the range of 230–420%. It will grow much faster in the emancipating, non-OECD countries, at least 4-fold and according to the maximum scenarios even more than 7-fold (table).

The growth forecast (2010 = 100) for land freight transport (tonne-km) in years 2010–2050

Area	Scenario		
	Minimum	Base	Maximum
World	332	393	523
OECD countries	177	194	197
Non-OECD countries	429	523	728
Regions with the highest growth dynamics			
Africa	486	767	967
China and India	523	603	901
Asia	468	648	893

Source: [OECD and ITF 2015, pp. 55–57].

Steadily growing customer expectations make the participants of supply chains increasingly exploit faster modes of air and road transport in order to meet these expectations and remain competitive. This is evidenced by, among others, the dynamic growth of air cargo – more than 40% from 36.5 million tonnes in 2005 to 51.3 million tonnes in 2015 [IATA 2015b], whose value reached \$6.8 trillion [IATA 2015a]. Among air cargo carriers, global logistics operators with FedEx at the head are increasingly significant. FedEx transported as much as 7.1 million tonnes of cargo in 2014, using a fleet of over 650 aircraft [FedEx 2015]. However, this leads to a significant increase in energy consumption, since both air and road transport are much more energy-intensive than other modes of transport, in particular maritime transport. Thus, greenhouse gas emissions increase significantly<sup>2</sup>. In 2015, airlines affiliated with IATA consumed 1.93 billion barrels of aviation fuel and it was about 310 million barrels more than in 2005 (growth by 19.1%) and emitted 771 million tonnes of CO<sub>2</sub> – an increase of 18.4 % compared to 2005 [IATA 2015b].

Of course, air transport is not the only mode of transport, and transport is not the only sector in which energy consumption and greenhouse gas emissions are growing, but its growth rate is very high. In particular, one can clearly see these relationships by analysing data for developed countries. In the European Union, especially in the countries of the “twelve,” greenhouse gas emissions fell significantly in all sectors except transport<sup>3</sup>. In the years 1990–2012 the total emissions in the EU, expressed as CO<sub>2</sub> equivalent decreased by 17% to 4824 million tonnes, while emissions from transport increased by 22% to 1174 million tonnes; thus, the share of the transport sector in the total emissions increased in the same period from 16.6% to 24.5%. The fastest, which should not be surprising, was the increase in emissions in air (80%), sea (over 22%) and road transport (almost 17%) [EU 2015].

One should also be aware of the greenhouse gas emissions resulting from the extraction and refining of crude oil, which is the primary source of energy in

<sup>2</sup> Performance of transport equal to 1 tonne-km is associated with the emission of at least 560 g CO<sub>2</sub> in air transport and only 3 g in maritime transport, assuming full utilization of available capacity [Maersk 2016].

<sup>3</sup> The authors, of course, are aware that the decline is the result of many causes, including the use of modern, more efficient technologies, improving insulation in buildings and thus reduced energy consumption, increasing the share of renewables in energy production and generally better organization of processes, but also intensive offshoring, resulting in the relocation of industrial plants to developing countries, as mentioned above. In case of offshoring, however, the advantage is apparent, since manufacturing processes in developing countries have higher energy consumption and frequently lower levels of participation of renewable energy sources in its production. One must also account for an increase in demand for transport due to the extension of the route travelled by the finished products and raw materials. As a result, as evidenced by Glen P. Peters and his team [2011], in the case of goods produced in countries to which production was moved, and consumed in the countries from which this part of the manufacturing sector was moved, the increase in CO<sub>2</sub> emissions was higher by 520% and caused the release into the atmosphere of additional 16 billion tonnes of CO<sub>2</sub> in the years 1990–2008.

transport. With crude oil, approx. 95% of transport in the world is carried out. For the EU, this percentage is slightly lower – approx. 90%, but still refining processes release an additional 127 million tonnes of CO<sub>2</sub>, of which approx. 70–80 million tonnes are attributed to the transport sector [EU 2015].

Greenhouse gas emissions and their growing concentration in the atmosphere and oceans lead to the acceleration of global warming. Even now, in many places in the world, one can clearly see the consequences of the dynamic temperature increase which took place in recent decades, which was excellently presented by Christian Parenti [2012]. Models of temperature rise developed by experts from the IPCC leave no doubt about the direction of these changes, while the question of the scale of the warming remains open. It depends on the measures to be taken in the near future. These radical and immediate ones may decelerate an increase in the average temperature on the earth to 2 °C considered a safe level. However, the continuation of current trends may even lead to an increase of 7 °C, which will certainly mean the end of civilization. Collapses befell many civilizations in the past, but never before has the threat covered the whole planet [Diamond 2011]. The scale of the problem, though seemingly still very distant, has fortunately become visible even for the leaders of countries, which resulted in the signing of an agreement on 12 December 2015, concluding the climate summit COP 21 in Paris. It is to be hoped that this document will become the foundation for effective reduction of greenhouse gas emissions, and not, as has already happened several times in the past, only another empty declaration. For this not to happen, it is necessary to put an enormous effort and make many changes in all key areas of life, including the economic model and the current version of capitalism, as stated by Naomi Klein [2014] in the book with the title which leaves no illusions: *This Changes Everything. Capitalism vs. The Climate*, and previously also Richard Heinberg [2011] in the book *The End of Growth*.

Not to be forgotten is also the fact that oil is a resource with limited supply, and its extraction and trade causes numerous and usually very serious consequences, especially for the countries importing it. These are the consequences of an economic nature, now greatly mitigated<sup>4</sup> due to the low price of oil on world markets, although this situation should be treated as transient, as well as the consequences of political, social, and health and environmental nature [Igliński 2015].

The result of the rapid development of transport are also costs resulting from transport accidents. WHO [2015] estimates that in 2013, approx. 1.25 million people were killed in road accidents globally and many times more suffered severe

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<sup>4</sup> At the same time, however, the low price causes huge economic, but also social problems in the mining and exporting countries, especially in those countries where it is the foundation of the economy and exports, and the costs of its extraction are higher than the current market price – approx. \$35 per barrel (as of 5.01.2016). This means that only some of the countries bordering the Persian Gulf operate oil at a profit, albeit a slight one [Goldman Sachs 2013].

detriment to health. Of course, the vast majority of these victims are individuals carrying out individual travels and involved in passenger transport, however both types of transport – freight and passenger transport influence each other and determine the level of security. Security in other modes of transport is higher, often significantly, particularly in air transport, but also in aviation there are many accidents in which several hundred to several thousand people a year lose their lives. The development and operation of transport also raises other external costs. The most important include pollution – in the EU alone, each year there are approx. 430 thousand premature deaths due to inhalation of pollutants from the transport sector [EEA 2014], as well as costs of noise, infrastructure s, the landscape modification and costs of up – and downstream processes.

There is therefore a fully justified and essential question of how to make transport cease to be so burdensome on the environment and society, and become a truly functional area supporting the sustainable development of supply chains.

### 3. Sustainable transport in supply chains

It seems that the only solution is decarbonisation of the transport sector. However, this is an extremely difficult task, given the almost total dominance of non-renewable fossil fuels, mainly oil, in the production of energy for transport. The difficulty is even greater as the departure from the hydrocarbons in transport will result in a significant change in its operation, and that will entail significant changes in the functioning of the economy and of course, the supply chains. Making this revolution will require extremely strong and intensive activities at various levels: international, national, but also regional and within cities and their groups. Many activities will be carried out by public entities and public funds, as well as individual users deciding how, how far and frequent they will travel. However, a significant part in this revolution will also be played by entities forming supply chains.

The possibility of further reducing the energy consumption by currently used vehicles with combustion engines is already small. Therefore, of course, we should invest in the most economical means of transport, but we should not put excessive hope in technological progress in this area in the long term. The use of alternative fuels will be more crucial. However, these will definitely not be the known and currently used biofuels. They have small or even negative energy efficiency, they require significant area of land needed to feed a growing population [Gilbert and Perl 2010]. It is also difficult to determine when it will be possible to commercialize research done on the next generation of biofuels – algae, bacteria. Slow progress suggests that rather not soon, rather giving rise to huge concerns about how aquatic ecosystems will respond to the emergence of these new organisms [Braun and Glidden 2014].

Proliferation of hydrogen as the fuel burned directly or primarily used in fuel cells is also a distant option. The main limitation is the expensive acquisition of hydrogen in financial, and above all energy terms (electrolysis). It is also difficult to store it securely, especially in vehicles [Sperling and Godron 2009]. The barrier is also almost complete lack of hydrogen refuelling stations. In March 2015, there were only 184 worldwide, with 82 in Europe and none in Poland. Unfortunately, this meagre perspective is not improved even by the introduction by Toyota of Mirai model in December 2014, or plans of the Motor Transport Institute to build 30 hydrogen stations in Poland by 2030 [ITS 2015]<sup>5</sup>. Widespread use of hydrogen is only expected in the years 2040–2050, and even later there will be trucks powered by this fuel.

Today, by far the best growth prospects, and above all rapid implementation also in cargo transport, are provided for hybrid vehicles and, above all, fully electric ones. The biggest advantages of electric vehicles include very high efficiency of the engines and the possibility of obtaining electricity from zero emission renewable energy sources. It must be noted, however, that the trucks will be powered not by batteries, but with the overhead catenary. In addition, they will use internal combustion engines, and in the longer term, improved batteries allowing for a substantial increase in the coefficient of accumulated power-to-weight. Today, intensive research and implementation works are conducted in this direction. Siemens is building two test sections in California near ports of Los Angeles, Long Beach and in Sweden, near Stockholm, where in 2016, the first tests of hybrid trucks will be held [Siemens 2016]. It should be noted that the key restriction for hybrid and electric means of transport is their dependence on rare earth metals and lithium [FDC 2013] whose supply is also very limited, and concentration of the extraction points is much higher than that of oil, which will necessarily result in numerous conflicts and problems and price increases.

Changing the source of energy for transportation is a long and very demanding process. Therefore, it is necessary to take other parallel actions. A very important area is the management of transport demand. It is intended to make the modal shift, which is far more intense than the current use of rail and inland waterway and sea transport. In aviation<sup>6</sup>, or more precisely in air transport, there is a potential for a renaissance of dirigibles – slower, but much more energy efficient and potentially with much larger capacity than today's airplanes – which is intensively worked upon [Pietrzak 2014], as well as the extensive use of drones [Igliński and Szymczak 2015]. Reducing instant deliveries by jets will require considerable effort on the part of logistics operators, to convince their customers that it is worth waiting longer for delivery, but it will be delivered in a sustainable and probably also cheaper way.

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<sup>5</sup> This is not much compared to nearly 6,500 traditional fuel stations available in Poland at the end of 2014 [Apanowicz 2015].

<sup>6</sup> The biggest problem of aviation is the inability to use fuels alternative to aviation fuel, with the exception of minor admixtures of biofuels. Increasing the share of biofuels, as already indicated, will not be possible for a long time.



Demand management will also require the rationalization of movements, reducing empty runs, increasing the use of cargo space, including the intensification of cooperation in the implementation of transport between the different entities, much greater use of logistics centres and, above all, shortening the physical distance of transport. Today, especially the latter seems unimaginable and unacceptable and contrary to the general trend, because it will lead to reshoring. This change will be certainly facilitated by further development of 3D printing, so that instead of sending finished products to the farthest corners of the globe often using air transport, it will be enough to upload digital product specifications, and it will be printed in the immediate vicinity of the point of purchase or use. Thus, the production process will undergo the next revolution from still universal subtractive manufacturing (machining, drilling, cutting) to additive manufacturing [Urry 2014].

A revolution in transport in the realization of cargo movements in the supply chain can also be brought on by autonomous vehicles [Szymczak 2013]. Today, more and more passenger car manufacturers, but not only, also the companies seemingly distant from the automotive industry – Google, are working intensively on the development of technologies to completely exclude people from driving cars. The truck manufacturers with Mercedes at the helm follow the same direction, albeit with some delay. It turns out that the biggest problem is not challenges of technology, but rather the law in force with the Vienna Convention on Road Traffic at the forefront, which does not allow independent vehicles moving without the driver<sup>7</sup>. The challenge in the future will also be finding another job by professional drivers, in Poland alone there are over 2 million. Apart from the significant controversy regarding autonomous vehicles, the advantages to their use will undoubtedly be crucial to many. They provide almost complete security, because the most common causes of accidents include errors and indisposition of drivers, or intentional actions – the consumption of alcohol. They allow for a sharp reduction in power consumption due to the ability to drive compliant with all requirements of ecodriving, and last but not least, they can work almost 24/7, with the exception of breaks for loading and unloading and for refuelling and maintenance.

## Conclusions

The development of supply chains should be multidirectional. One may indeed determine certain desirable meta-directions of development, but today's market requirements dictate programming development in order to satisfy the greatest

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<sup>7</sup> Several states in the US are the exception, including Nevada and California, where the movement of such vehicles is permitted, but still the driver must be able to take control of the vehicle.

number of stakeholders –including those who are not directly involved in supply chain management, but are affected by the way it works. Programming this development must take into account many aspects concerning various phases of the flow of resources and all supply chain participants. The most important of them relate to the production and transportation. This is due to the role these processes perform in the supply chain, their impact on the result of the functioning of the supply chain, and what impact they may have on the environment.

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# Poland as an example of economic development through participation in European supply chains

## Introduction

The processes of international trade are shaped by the economic image of Europe. Since creation of the foundations of the EU in the form of the European Coal and Steel Community, the integration processes has been taking place mainly in the area of economic cooperation within the Union. Elimination of various barriers between the countries and provisions for easier movement of goods, people and capital open new areas of exchange and enable the use of the economic potential of the European continent. Implementation of the ambitious plans for the construction of European transport corridors and assistance aimed at overcoming transport barriers and supplementing the necessary logistics infrastructure in individual countries are a boost to the economy. Improving the capacity of transport routes, shortening logistics operations, increasing the security of stocks and cost reduction of logistic services significantly influence the assessment of investment attractiveness of the areas concerned.

## 1. Development supported by logistics infrastructure

Since Polish accession to the European Union, the primary objective aiming at an increase in cohesion among the member countries has been to increase the pace of economic development as expressed primarily through an increase in investments in our country. Accession to the Union structures has allowed a gradual increase in the participation of Polish entities in the structure of supply chains on a Euro-

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pean scale. Although in the initial stage of this process, significant advantages of investments in Poland were low labour costs, relatively attractive land prices and a negligible level of local competition allowing for gaining the new market, after fifteen years the investors' reasons have changed. Due to stable economic growth, Poland becomes a relatively fast-growing export market. As it was disclosed in the research by Lizińska, the reason for investing revealed in 2008–2010, different from the then existing ones, was a better use of business resources [Lizińska 2012]. Investors appreciate the growth prospects associated with the optimal use of their resources more than previously perceived benefits of the market and costs. One of the factors to optimize operations in the supply chains is the development of logistics infrastructure, both linear, nodal and transport. The need to build and develop infrastructure is emphasised in the definition by M. Ratajczak, who describes it as a set of devices and institutions, providing services without which functioning and development of a system would not be possible [Ratajczak 1999]. Undoubtedly, supply chain systems are the systems operating in the area of the economy and having a direct impact on its development. Their effectiveness largely depends on the availability of efficient logistics infrastructure. The main objective of Polish accession related to the country's economic advancement is therefore convergent with the provisions of the White Paper on the creation of a uniform European transport area and defining the objectives of EU aimed at achieving a competitive and resource efficient transport system [*European Transport* 2010].

The expansion of an area of the common uniform European market to Poland had an impact on the shape and course of European supply chains. Enterprises in the process of rationalisation of structures and supply rebuilt the existing connections to adapt to the new territorial shape of the EU [Van Goor, Ploos van Amstel and Ploos von Amstel 2003]. One of the purposes of such rationalisation was to use the economic potential associated with favourable cost circumstances prevailing in the new Member States. Today, after a period of adjustment, areas of increased logistics activity are noticeable in Poland. Two of them are the most characteristic and indicative of the impact of infrastructure development on economic development. One, located around Stryków, at the intersection of two very important transport corridors: East-West and North-South. The second one is an area of deep-water container port in Gdansk, at the start of the transport corridor connecting the Baltic Sea with the Adriatic Sea. Both of these are of strategic importance for the improvement of trade and the compression of time in the operations of European supply chains in the eastern part of Europe. The construction of a deep-water container terminal in Gdańsk opened the possibility of operating a modern fleet of deep-sea container ship traffic. The expansion of the terminal with a new wharf by 2016 will increase the throughput capacity from 1.5 million TEU to 3 million TEU per year [Grabowska]. The competitive advantages of the port involving access to the deep waters of the Gulf of Gdańsk and central location in the Baltic Sea

are emphasised [Raben]. As a result, the port can participate in the exchange of goods between Europe and global partners, acting as a convenient alternative to the ports of Rotterdam and Hamburg. Further development of spatial capabilities of the port involves the expansion of storage infrastructure and the construction of a railway siding with reloading facilities to increase the share of intermodal transport in the total transport of goods. The increase in carriers' interest will result in more freight traffic on the Polish territory, thus perpetuating the role of infrastructure development in establishing economic activity.

The increasing density of foreign investment along the axis Gdańsk – Stryków – Katowice is an indication for the formation of an important area of high-intensity logistics operations. This zone is forming along the trans-European transport corridor no. 6 based on European distribution centres located there and production centres using the available road infrastructure. This area, referred to as an emerging distribution hub, provides logistics operations in Eastern and Southern Europe in a manner consistent with the standards for efficiency, safety and time compression that developed in Western Europe. It seems that due to the relatively low cost of storage space and the growing potential market in areas of high population density, like Tri-City, Warsaw and Katowice agglomerations, an area of economic opportunities associated with the production, transport and sale of goods is being created. In this way, efficient logistics infrastructure contributes to the investment competitiveness of Poland. Providing production capacity associated with low labour costs at the beginning of the period after accession, as well as access to the growing consumer market and the possibilities of selling products and services also in the developing Central-Eastern Europe identifies two benefit areas for the investors analysing the economic attractiveness of Poland. The construction of highways provides significant support for local enterprises and allows them to become reliable partners for European supply chains. These chains carry out their supplies based on efficient transport infrastructure supporting confidence in planning and minimising the costs of logistics operations across the continent. The research on the effects of the impact of A2 motorway allowed formulating the benefits for the companies locating their operations in the vicinity of access junctions. Shortening the travel time is associated with higher permissible speeds of movement and the road construction increasing rate of traffic. Higher driving smoothness reduces consumption of fuel and wear parts of vehicles, which affects the transport costs and more efficient use of vehicles. Available road network with highway parameters greatly increases the efficiency of road transport compared to other modes of transport [Rekowski, Kawa and Jurczak 2011]. Due to the flexibility of road transport, this is a very popular form among small and medium enterprises carrying smaller batches in variable connection configurations. Analysis of the impact of the highway on the economics of enterprises indicates a significant increase in competitiveness with simultaneous reduction in overall company costs. The impact of A2 motorway on company

economics is evaluated differently depending on the area of influence (statistical results) [Rekowski, Kawa and Jurczak 2011]:

- increase in the level of competitiveness (+16%),
- increase in the company's revenues (+14.5%),
- profit growth (reduction of losses directly related to transport by –12.5%),
- reduction of overhead costs (–11.9%),
- employment growth (+6.5%).

Regional development along transport corridors proves the need for extension of such connections and further penetration of expressways in order to connect further areas of economic activity. Regions of Poznań and Wrocław are examples of the benefits associated with the availability of efficient logistics infrastructure for both transport and storage. Although the expansion of the latter is carried out on the basis of investors' funds, its formation is related with efficient transport routes in the region. Expansion of distribution centres in the network of the Warsaw agglomeration is associated with the need for a high standard of logistics service in the area with high population density. Just as the development of storage centres in and around Rzeszów, it will be increasingly significant as a result of further economic integration of the regions off the eastern Polish border. The availability of modern warehouse space equipped with resources control system and ensuring appropriate conditions for storage and handling of various resources is one of the conditions for Polish entrepreneurs to become partners for the European supply chains, which require a certain level of quality of logistics operations [Abt 2001].

Creating a new transport axis running along the Baltic-Adriatic transport corridor is linked to progress in the process of building a coherent EU market. The growing share of enterprises located in Poland in the internal and external EU exchange takes place thanks to the prepared infrastructure. This new, currently emerging area of particular logistics activity is located in areas of historically largest territorial EU accession. On 1 May 2004, the EU accepted nine other countries besides Poland: Latvia, Estonia and Lithuania, the Czech Republic, Slovakia, Hungary and Slovenia, and Malta and Cyprus. In the geographical sense, it meant the extension of the EU with Central and Eastern Europe. The imbalance in the economic development of the Western and Eastern Europe, particularly visible immediately after accession is nowadays outweighed by the growing participation of the new EU members in the European supply chains. Compared to competitive and still the most important economic axis in Europe created between the port of Rotterdam and Milan, it should be emphasized that its formation was related to the economic transformations associated with the beginning of the creation of the European Union project. In the initial phase it related to countries located precisely in this region and assumed the economic integration between the entities of the individual economies from the beginning. As a result, they transformed in time into repetitive ties of suppliers, partnerships, resulting in creation of European



supply chains. An important aspect of the success of this process is the fact that it precedes the formation of Central and Eastern Europe axis by 47 years. Given the time that has elapsed since the creation of the EU to the current economic position of the region, one should specify the prospects for the development of the axis in Central-Eastern Europe, which starts its course in Poland. Certainly, further territorial accessions to the EU to the south and east of the continent will increase the gravity of the potential logistics hub connecting the Adriatic Sea to the Baltic Sea. Moreover, the economic development of the countries without access to the sea, such as the Czech Republic, Slovakia, Hungary can contribute to the growth of economic and logistics activity in both directions of the Baltic-Adriatic corridor. Due to such connections, industry in Europe is likely to remain a significant stakeholder of the development on a global scale, as reflected in the increasing exchange of goods in the EU and participation in global supply chains. The time elapsed with the development of industry and logistics links based on the logistics infrastructure has enabled the construction of a continent characterized by high logistics performance. This has a direct impact on location decisions and further development of Europe's economy, especially from a global perspective.

## 2. The expansion of transport and storage infrastructure

The market of transport and logistics in Europe is constantly changing. Policy of the European Union faces challenges in ensuring favourable conditions to increasing the competitiveness of the European economy. Therefore, besides the issues of cultural differences, exercise of freedoms resulting from the abolition of borders, development of the transport system in order to increase the territorial availability of Member States, one should also consider the specificity of global logistics solutions, in order to be competitive for the economies of China, Russia or the United States.

The development of modern warehousing infrastructure in Poland began in 1995. The first facilities: *Warsaw Distribution Center* and *Warsaw Industrial Center* were established in the vicinity of Warsaw. In 1997 *Prologis*, one of the largest warehouse market developers initiated its operations in Poland. A little later – from 2005 storage facilities were built in Poland due to launch of the operations by the new entity – *Panattoni*. A year later, *Sergo* entered the Polish market, while in 2008, Goodman initiated development activity.

Upon accession to the European Union in 2004, Poland had nearly 1 million square meters of warehouse space. That year was a breakthrough for the country in many ways, one of which was obtaining EU funding for infrastructure development. Undeniably, the expansion of the network of roads and highways has a significant impact on the economic development of the country, among other

things, initiating the formation of new logistics facilities. In the year of accession to the European Union, Poland had 631 km of expressways and motorways. Ten years later, there were 3 000 km of highways, 1,553.2 km motorways and 1,467.5 km of expressways. In 2014, the total of 327.8 km of new roads were completed [GDDKiA 2014]. The consequences of joining the European Union cannot be disregarded, because Poland is one of the leading countries in terms of growth dynamics of highways as compared to the European Union [Pieriegud 2015]. The national roads construction program for 2014–2023 will undoubtedly greatly modernize and develop the transport infrastructure of the country. Development of road infrastructure is highly correlated with the development of the warehouse market, as it determines the creation of new logistics locations. The growing selection of the facilities located in places connecting various routes makes distributors and producers in other countries begin to move their logistics activities to Poland. After ten years of membership in the European Union, total warehouse space in Poland was already 8 million square meters [Cieliczko and Jędrak 2014 p. 83].

Therefore, the opportunities associated with the development of the warehouse market include the planned development of transport infrastructure, as well as the potential resulting from the increase in supply. The increased interest in leasing is determined by, among other things, economic development, investing in promising industries, as well as incentives attracting the operators in logistics industry. Poland is cost effective, because the offered rental rates for warehouse space in Europe are lower by 20–30% than in neighbouring countries [Cieliczko and Jędrak 2014, p. 83], while ensuring high technical and utilitarian quality.

Currently, distribution centres and production lines of many global companies are being established in Poland. Company *Amazon* located three warehouses in Poland – one in Sady near Poznań and two in Bielany Wrocławskie (total area of 324 m<sup>2</sup>). There are many entities playing an important role in developing the offer of storage facilities, such as *Goodyear* and *Volkswagen*, also contributing to the country's economic growth and increase in the attractiveness of Poland in the international arena.

Access to markets, transit and the nature and number of customers are the main factors determining a decision concerning the location of logistics facilities. Investments in this area significantly change the map of Europe. In Western Europe, logistics real estate is popular among tenants interested in Pan-European distribution centres of goods and services. The search for savings, and above all reaching ever more demanding customers in the markets in Central and Eastern Europe contributes to the investors pursuing locations for their logistics and distribution centres in the area. Storage facilities are becoming increasingly complex, and the latest technology improves their effectiveness and efficiency of operations.

Moreover, the geographical location, guaranteeing access to the Baltic Sea and transit from Western Europe to Eastern Europe and Russia is also a determinant

of the development of the warehouse property market in Poland. Polish seaports – Szczecin-Świnoujście, Gdynia and Gdańsk have connections with the major global ports. A good macroeconomic situation of the country is also an important factor. Polish economic growth in 2014 amounted to 3.3% of GDP, while at the same time the EU average was 1.3%. The result was one of the best in the European Union. Poland as one of the few countries avoided recession during the global economic crisis.

Investors benefiting from the development of the network of roads and highways choose the storage areas located near them. There has been a development of small storage facilities (SBJ – Small Business Unit) located in the city centres and those on the outskirts of the cities. The choice of location and size of a facility, apart from the financial considerations is determined by the specifics of the industry, as well as the range of products of a company. SBU facilities, beside the warehouse space also offer representative offices, and their certain advantage, in addition to location is also access to public transportation and major routes.

Any discussion of the warehouse market must emphasize the essence of e-commerce industry, whose share in the lease significantly increases. Poland is a leader in Central and Eastern Europe in handling e-shipments, facilitated by an increasingly better road network and a promising and receptive market. E-commerce in Poland is recording the largest increase among the EU countries, and its value is estimated at about 34 billion zlotys<sup>2</sup>. The number of e-commerce stores in early 2015 in Poland amounted to about 20,000. Forecasts for the next few years regarding a growing share of mobile devices<sup>3</sup> for e-commerce expect further increases in sales, which no doubt will translate into the operation of supply chains and the development of demand for logistics real estate. Dynamic growth of Internet sales entails a number of significant changes. Moreover, the development of e-commerce is undoubtedly affected by broadly interpreted innovation and online and mobile payment, bringing trade into a new dimension of shopping.

Monitoring, analysis and evaluation of factors in the development of the warehouse market also plays an important role for related, strongly associated markets. Development of warehouse space is undoubtedly an indicator for change among companies offering storage space equipment. Knowledge of the potential for storage facility equipment definitely helps in the effective management according to the principles and requirements relating to security or environmental protection.

In 2014, the total supply of modern warehouse space in major Polish markets amounted to nearly 9 million square meters. New contracts accounted for 71% of demand, compared to 29% subject to renegotiation [Colliers International 2015]. In 2014, projects with a total area of almost 1.1 million m<sup>2</sup> were completed. The

<sup>2</sup> The reports are not unanimous and there is a large diversity in determining the market value and the percentage of its share. This is the result of different methodologies of the entities, which performed these analyses.

<sup>3</sup> According to the forecasts, by 2025 there will be 80 billion devices connected to the Internet.

dynamics of the previous years demonstrates the spectacular growth in this market. The vacancy rate at the end of 2014 was at 5.5%. It should be noted, however, that depending on the entity conducting market analysis, data and indicators are slightly different from each other. The presented supply and demand values of warehouse space in Poland have therefore been averaged. The volume of investment transactions for the storage sector in Poland in 2014 exceeded 700 million euros.

The third quarter of 2015 in the warehouse market in Poland was marked by high activity of tenants. Since the beginning of the year leases were signed for nearly 630,000 m<sup>2</sup>. At the same time a total of about 1.94 million square meters were leased [e-logistyka.pl 2015b]. That is 27% more than in the corresponding period of 2014. New leases accounted for 67%, relative to 33% of extended lease agreements. The dynamics of interest in the warehouse space in Poland is undoubtedly a response to the growing interest in renting. The vast majority of new space is speculative. The already mature markets are constantly developing (Warsaw-Warsaw City and the outskirts of Warsaw), Upper Silesia, Poznań, Central Poland and Wrocław), but the recovery is also observed in cities such as Szczecin, Rzeszów, Lublin and Bydgoszcz.

Figure 1 illustrates the situation in the warehouse space market in Central Europe in the period of 10 years. Demand for warehouse space shows an upward trend, which, however, is not equal in all countries. It is clear that Poland ranks very favourably against the trends of Central Europe.

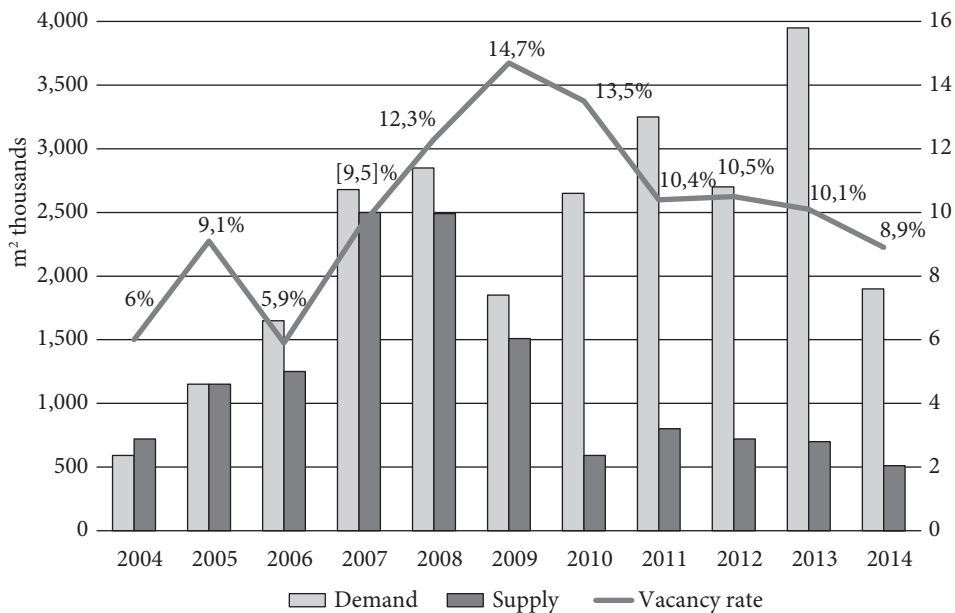


Figure 1. Supply and demand for warehouse space and vacancy rates in Central Europe in 2004–2014

Source: [Cushman and Wakefield 2014]

For several quarters, the main Polish regions have offered stable rental rates at 4.00–5.50 EUR/m<sup>2</sup>/month [e-logistyka.pl 2015b]. At the end of the third quarter of 2015, the total supply of warehouse and production space in Poland was 9.63 million square meters. This result puts Poland in ninth place in Europe. At the same time, developers put into service 392,000 m<sup>2</sup> of new space, compared to 447,000 square meters completed in the first half of the year [JLL 2015, p. 2].

It should be emphasized that the supply and the vacancy rate in Poland strongly differentiates the region and its logistics attractiveness. Although there still is a lot to be done, Poland as the location of a storage facility is viewed favourably, and its position is strengthening. The largest number of investments related to logistics services is found in three provinces: Mazowieckie, Śląskie and Wielkopolskie. The cost attractiveness of Poland is undoubtedly a stimulant for future demand for warehouse space.

Cushman & Wakefield [e-logistyka.pl 2015a] estimate that the prospects for the warehouse market in Poland are very good. According to forecasts for 2016 years, high demand for warehouse space will be generated by e-commerce sector. Furthermore, the automotive industry, retailers and logistics operators will remain significant. Rents and vacancy rates will remain at the current level. Taking into account the dynamics of the warehouse market development in the first half of 2016, its total resources are expected to exceed 10 million m<sup>2</sup> [e-logistyka.pl 2015a].

### 3. The change in logistics performance index in Poland

Logistics Performance Index (LPI) is used to measure the ability to manage the logistics operations carried out on the territory of a given country. Expressed numerically, the index is a weighted average of the six areas affecting the logistics activity. The starting point for the analysis of logistics performance, customs control efficiency index tests its predictability and minimises losses associated with the settlement of customs duties. Infrastructure is another area of research. The country's availability of roads and railways, water and air routes and the level of advancement of intermodal transport solutions significantly affect the transport throughput and related costs. The next research area is international shipments. Its result is affected by availability of logistics operators influencing the ease of implementing international shipments and the degree of competition in transport, reducing its costs. An important part of the assessment are the competencies of logistics operators, which can significantly improve the course of logistics operations. The ability to identify and track shipments is also examined. An important aspect of the operation of international supply chains enabling synchronisation of production and logistics. The list ends with the level of delays in transport opera-

tions, which affects the safety assessment of the availability of resources and the level of logistics services in the territory.

European countries demonstrate high diversity in the level of the LPI. First places in the ranking established in 2014 are occupied by Germany, the Netherlands and Belgium. The averaged LPI<sub>m</sub> index of these countries is 4.07. These countries are in the previously described area of particular intense logistical operations in the vicinity of major European ports: Rotterdam, Antwerp and Hamburg. High standards of logistics in that region are the result of many years of cooperation of the entities in European supply chains. They are the ones, which shaped the development of accessible infrastructure, its modality and technical advancement. Today, they are a model for countries aspiring to create competitive areas of high logistics performance.

Against this background, one can assess the level of changes taking place since Polish accession to 2014. The measurement made by the World Bank in the years: 2007, 2010, 2012 and 2014, established a growth of LPI. In respective years it amounted to: 3.04; 3.44; 3.43; 3.49. Economic development after accession and increase in contacts between Polish business entities and European supply chains has forced investment in infrastructure. Noticeable improvement of logistics performance took place on the basis of expanding infrastructure and increase in logistics competence. Improving the conditions for transport and storage increased investment attractiveness of areas along the international transport corridors. This facilitated implementation of international logistics operations. The progress in logistics performance is recorded in subsequent studies of the World Bank, faster at the beginning of the period and slower in recent years is a positive indicator of the possible trend of development of Central and Eastern transport axis. The accession in 2004 added to the EU's economic body quite a large area of Central and Eastern Europe, which was a challenge in the construction of transport connections.

The territories of the States joined in the fifth accession are intersected by the following European transport corridors: North Sea-Baltic Sea, the Baltic-Adriatic, the Rhine-Danube, the Mediterranean and the Orient-East Mediterranean Sea connecting by sea the furthest located Cyprus. 10 years have passed since the expansion, and the average LPI in 2014 for the fifth accession group is LPI<sub>m</sub> = 3.31.

Territorial development of the EU taking place due to successive accessions involves successive joining of subsequent countries and logistic systems operating within their territories. The passing years of economic cooperation between operators of individual countries of the expanding union have improved transport infrastructure and increased the level of LPI. The dates significant for this process are accession times of successive groups of countries: 1973, 1981, 1986, 1995, 2004, 2007, and 2013. Average levels of LPI for groups of accessing countries in terms of subsequent accessions demonstrate their dependence on the duration of membership in the EU.

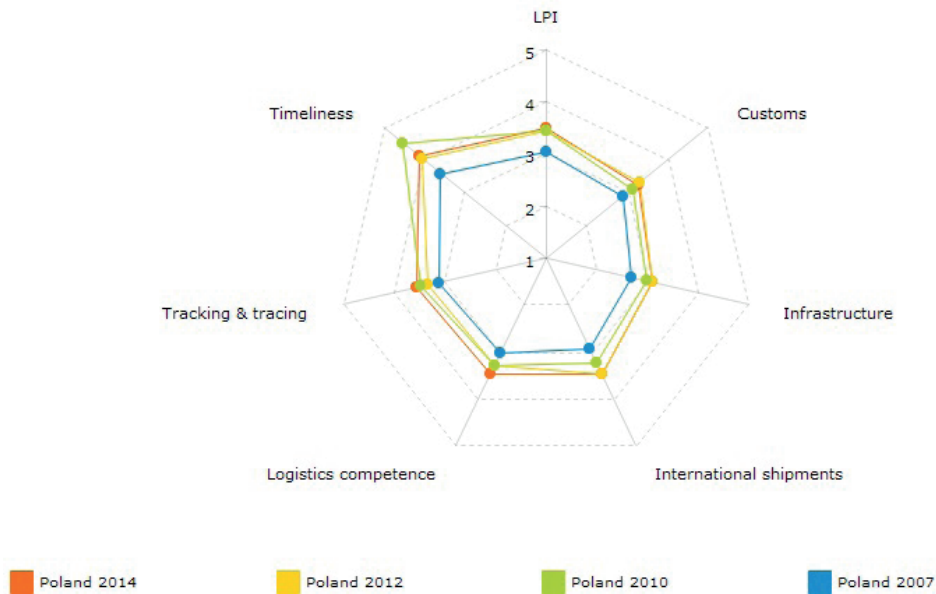


Figure 2. Polish LPI in the years 2007, 2010, 2012, 2014

Source: [lpi.worldbank.org]

Countries opening the world LPI ranking: Belgium, France, the Netherlands, Luxembourg, Italy and Germany initiated the establishment of the EU by organizations of the European Coal and Steel Community. The accession groups arising after the event reveal successively lower averaged LPI results. LPI averaged index calculated for successive accession groups grows simultaneously with an increase in time elapsed from accession to the EU. The data for both groups show Pearson's correlation coefficient  $r = 0.89$ . It indicates a strong correlation (the interval  $[-1.1]$ ). The group of candidates for the EU membership complements comparison of accession groups. Its averaged index is 3.0. On the opposite end of this list are the founding countries of the EU, together with Germany, a leader of the LPI = 4.12. The difference between these two extreme groups comes down to 63 years of cooperation between business partners, forming European supply chains, using streamlined logistics infrastructure including a growing area of unifying Europe.

The increase in logistics performance in Poland should be assessed as compliant with the indicated correlation. Expansion of European network of transport corridors allows the release of the economic potential located in remote regions of the continent. A program to build a contiguous European Union area involves the development of connections in the directions of east and west, which is particularly important for accession areas located mainly in the East and South of Europe. High infrastructure standards in Central Europe should be a model for transport

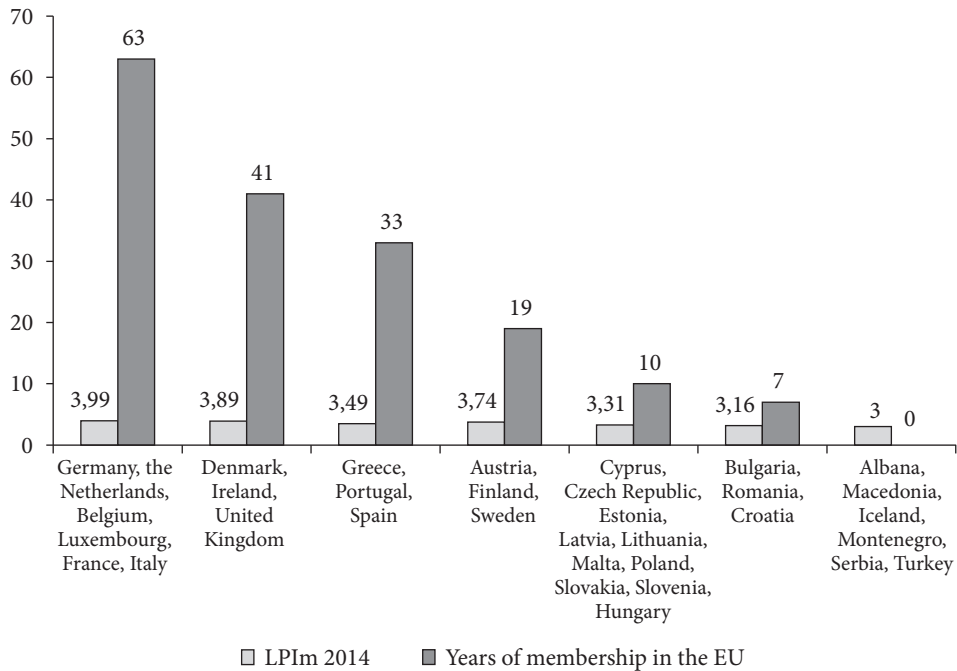


Figure 3. The relationship between the length of the period of membership in the EU and averaged LPIm for the accession group. (LPI according to World Bank data, 2014)

Source: [Gołomska, Majchrzak-Lepczyk and Bentyń 2015, p. 65]

axis of Central-Eastern Europe passing through the territory of Poland. Due to the existing and constantly expanding logistics infrastructure, one can count on a growing interest of logistics providers using it directly to optimize their operations. Thanks to them, and through investing in distribution centres, port storage facilities and the expansion of transport infrastructure in specific industrial areas in Poland, logistics performance is increasing and supporting the investment attractiveness of the area.

#### 4. European supply chains

Supply chains, which emerged within the geographical area of Europe, can be described as European logistics chains. Co-operation within a supply chain should involve joint planning, implementation and control of the flows of property, information and financial services. The framework of such cooperation should be understood as a kind of relationship, based on mutual trust and commitment of



all stakeholders. An important support for the chain is undoubtedly the European logistics infrastructure and advanced IT connecting individual entities in the process of exchange of information [Gołemska 2009].

In order to emphasise the characteristics of European supply chains, it is reasonable to identify the characteristics of businesses operating in Europe. However, it must be clearly stressed that significant differences between countries are observed within the EU structures, which are primarily components of cultural, moral, religious, or linguistic differences. Thus, the unification of European countries implies new market relations, shaping demand for goods and services within the common market.

Globalisation, the increasingly fierce competitive struggle, permanently increasing expectations and demands of customers are the challenges faced by all economic operators. Global economic, political, environmental, or social processes trigger many changes in the operation of companies. The success of a company on the Euromarket depends on its skills and ability to adapt to market realities. Diverse economic conditions of each country and their economic situation significantly affect the level of demand for particular goods or services, which can lead to significant disruptions in the supply chains.

The environment in which modern enterprises operate is highly complex. It is reflected by, among other things, the current political and economic situation in Europe. Operators are forced to cope with the challenges of the crises, the problems of the euro zone, or the wave of immigrants, which contribute to international disputes. The diverse levels of prosperity of European citizens and their purchasing power also significantly affect the operation of supply chains.

European Union market consists of 500 million consumers, aspiring to be one of the largest retail markets in the world. It allows free trade in all Member States<sup>4</sup>. Besides the support for economic growth and social change, the EU policy emphasises broadly interpreted consumer support [Gołemska, Majchrzak-Lepczyk and Bentyn 2015, p. 168]. Consumer spending represents 57% of the EU's gross domestic product (GDP) [European Commission 2014].

In order to discuss the efficiency of operation in a supply chain, one must identify the similarities among European countries. In Europe, at least five groups with relatively homogeneous consumer cultures are distinguished: [Lisowska-Magdziarz 2007]:

- United Kingdom and Ireland,
- Germany and Austria,
- Netherlands, Luxembourg, Sweden, Finland, Denmark, Latvia and Estonia,
- Greece, Portugal, Spain, Italy, France, Belgium, Cyprus, Malta and Slovenia,
- Poland, Lithuania, Czech Republic, Slovakia and Hungary.

<sup>4</sup> Freedom of movement also applies to Norway, Iceland and Liechtenstein.

Knowledge of the similarities among consumers can help clearly define the differences in styles of consumption and communication, or relations. Therefore, diversification of markets increases the need for flexibility of entities, in order to adjust the offer to demand of individual buying groups. The distinguishing feature of Europe compared to other areas is undoubtedly its economic activity. Many countries joining the European Union had to overcome the barriers, making up for their economic shortcomings, in order to effectively cooperate within the European supply chains. Besides Poland, it is worth mentioning countries such as the Czech Republic, Slovakia, Slovenia, and Hungary. Nowadays, locations in Central and Eastern Europe are gaining logistics attractiveness. Moreover, development of transport infrastructure and an increase in the mass consumer market contribute to the emergence of new industrial and distribution hubs. The dominant position of Western Europe in terms of distribution is increasingly questioned by some hubs in Central and Eastern Europe, such as Prague or Bratislava. An important factor stimulating cooperation is also the removal of barriers to the movement of products. Supporting the development of transport and logistics, implemented through investments, and deregulation of the transport market are also relevant. The development of e-commerce and its impact on changes in the operation of trade revolutionise the relationships within the supply chains. This increases a significant emphasis on the quality of provided logistics services. Figure 4 illustrates the determinants and directions of development of supply chains in Europe.

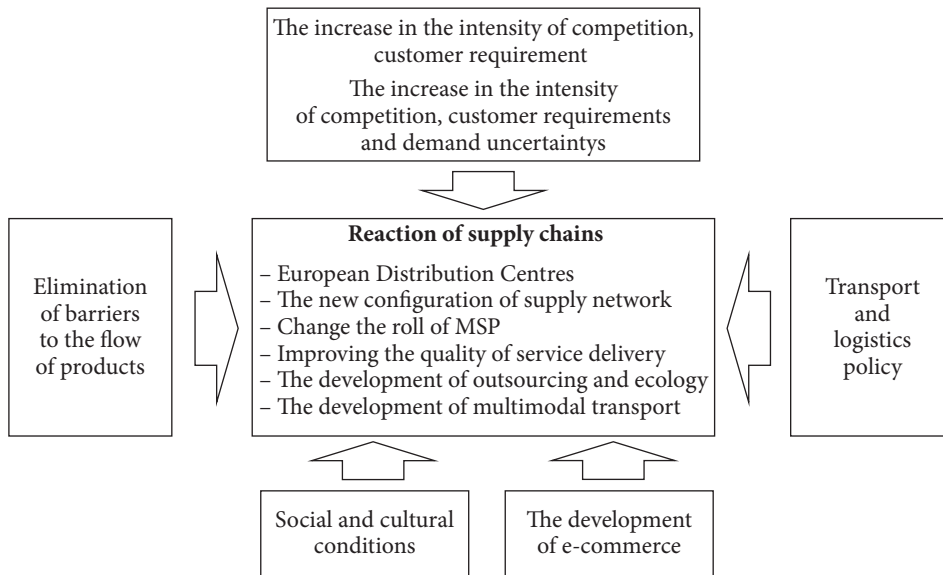


Figure 4. Determinants and directions of development of European supply chains

Source: [Witkowski 2010, p. 2015]

Obtaining a competitive advantage in the changing management conditions becomes a business objective. Sometimes there is a reconfiguration of supply chains for optimal use of resources.

With the abolition of most of the barriers within the European continent and the opening of the common market, companies gained a chance to operate on the new, often distant markets. The realisation of such a project is possible, however, at considerable capital investment in own logistics structures, or using an offer of 3PL (Third Party Logistics) logistics operators. Today, outsourcing logistics services is a very popular option, allowing logistics operators to gain strength. Such actions create value growth of the European TFL (Transport, Forwarding, Logistics) market. The most developed areas in Europe in terms of concentration of TFL are the Benelux countries, Great Britain and Germany.

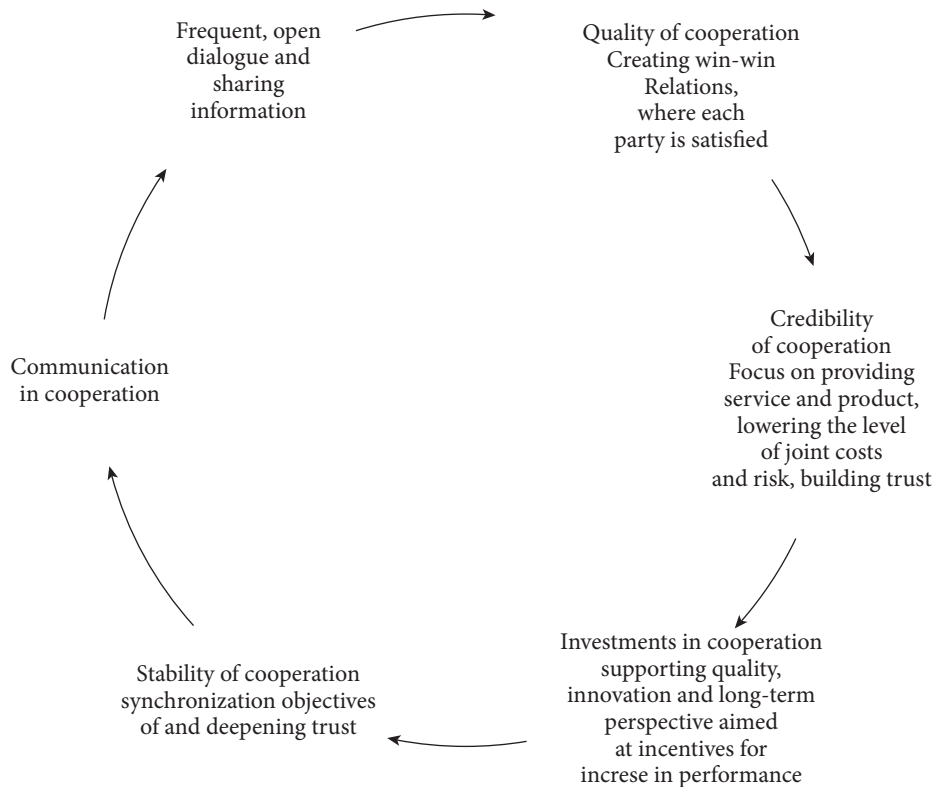


Figure 5. Elements of successful collaboration in the supply chain

Source: Own study based on: [Wilding and Humphries 2006, p. 315]

These countries are at the forefront for a reason, because in their area there is a high concentration of distribution centres, which determine a wide range of

services of specialized logistics companies. This in turn allows smaller companies to carry out transportation and storage operations without their own participation in structural investments.

Flexible supply chains are capable of rapid adaptation to changes in the market or in the competitive environment. Their adaptability is based on the rapid flow of information. Due to the advanced infrastructure, the development of IT and a range of business experience, European countries build supply chains often supported by modern logistics centres. Consequently, implementation of tasks of a flexible supply chain becomes easier. Adjusting logistics operations in terms of demand variability reduces costs, providing the ability to seize market opportunities. The success of cooperation based on partnership relations is determined by a certain sequence of actions (Figure 5). There is a certain reaction cycle, which perpetuates cooperation, creating a more complete communication.

## Conclusions

Europe, as an important point of reference in international trade is obliged to observe changes and trends occurring in the markets in order to adopt new strategic determinants in terms of economy and trade. Meanwhile, Poland benefits from this experience, and furthermore, being a member country makes a very good use of the opportunity granted by membership in the European Union. The theses presented in the article indicate it clearly, emphasizing the developing areas. The stable domestic economic situation and the development of infrastructure allow perceiving Poland as a country attractive for investment.

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# The Development of Tourism Industry and Tourism Market





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## The impact of the information society on consumer behaviour on the tourist market

### Introduction

Societies of individual countries gradually enter into a new era characterized by, among others, widespread use of information and telecommunications technologies, diversified social structures, fragmented culture in which the values include freedom of expression, self-expression, experience, knowledge, imagination combined with creativity, tolerance and harmony. Networking of people's lives follows as a result of technical progress and the transformation of mentality. R&D and communication infrastructure is also reinforced [Nawrocka 2007, p. 132]. The society entered the era in which the ability to create knowledge, acquire and process information determines the success. Modern society is called information society. Ubiquitous is the building of knowledge potential as a basis for socio-economic development.

The paper reviews the changes in access to information, speed of information, which affect the change in lifestyles and consumption patterns reflected in the tourist market. The authors characterize the so-called information society and its impact on the tourist market.

These transformations apply to virtually every aspect of life, including consumption and consumer behaviour in the travel market. Constant improvement of education and skills characterizing the information society makes the tourists prepared to encounter the region, having high knowledge of the attractions, culture and customs of the places visited. In the case of foreign travel it also refers to the language of the respective country. Tourism is an industry that reflects the social changes affecting the behaviour of consumers, since a tourism product is extremely complex and contains intangible elements related to the experiences of consumers. Thus, an important result of social change are processes of individualisation

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of consumption and related phenomena of prosumption, co-consumption and divergence of behaviour.

On the demand side of tourism, there is a noticeable increase in demand from consumers (tourists), which stems from greater awareness, understanding their needs and greater knowledge of the opportunities offered by the global tourist market. This process is the result of globalization and educating consumers on the basis of the development of communication techniques. A tourist has access to information and the knowledge affects the growth of requirements as to the scope and standard of services. Therefore, on the side of the area receiving the tourists, the multi-optionality of supply and international standards are required. The market has an increasing number of institutions striving for managing the leisure of consumers, and with information overload and decreasing sensitivity to promotional messages – effectively communicating a market message to potential customers becomes very difficult [Kachniewska 2015, pp. 36–37]. One can agree with the thesis by Mazurek – Łopacińska and Sobocińska that on the one hand, development of forms of marketing communication is one of the factors influencing consumer behaviour, on the other hand, ways and forms of marketing communication with consumers used by businesses, as well as the values in the advertising messages are a response to new trends in consumption. [Mazurek-Łopacińska and Sobocińska 2015, pp. 143–144]. There is no doubt that the general social processes reflected in the so-called information society affect the behaviour of market participants and the relationships between them. This also applies to the tourist market.

## 1. Information society – conditions and characteristics

After the agrarian and industrial era, the modern society has entered a new era, which is the period of information, or building the information society (knowledge-based)<sup>2</sup>, in which every citizen has access to information and communication technologies (i.e.: computers, the Internet and other networks, phones, smartphones, tablets, servers, terminals, SmartTV), they have the skills, awareness and potential of ICT (Information and Communication Technology) use to effectively acquire reliable information in order to best achieve their objectives [Żelazny 2013]. As Wojciech Cellary rightly pointed out, in the term “information society” on the foreground there is the concept of information, but in relation to a human it is more about knowledge that is necessary both to assimilate and understand information, as well as to create it [Cellary 2002]. In the era of information overload on the market, the information society must therefore demonstrate the ability to

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<sup>2</sup> A broad overview of the definition of an information society, see: [Bliźniuk and Nowak 2006].

interpret and use it for their own purposes (so, it must have adequate knowledge). Ubiquitous is the building of knowledge capacity as a basis for socio-economic development. Knowledge is created and developed, thereby improving its quality in the process of personalizing information as a result of research, discovery, experience, education, direct and indirect social contacts, values and human intuition. Society entered the era in which the ability to create knowledge, acquire and process information determines the success. However, it is contingent on transmitting and the ability to read information by members of the public and the speed of the process.

The development of the information society results from the processes characteristic of the society itself, but also arising from the development of technology.

The first above-mentioned include:

- extending learning process (in agrarian society, this process lasted from 5 to 14 years of age, in industrial society from 7 to 24 years of age [Wrzeszcz-Kamińska 2007, p. 119] and now continuing education is promoted and organized;
- development of social capital, resulting from the historically and socially formed values, as well as the development of social institutions;
- processes of democracy and the decentralization of power leading to greater consistency (and responsibility) of local communities;
- greater social mobility associated with the development of transport, but also less attachment to the place of origin and greater adaptability to new conditions;
- differentiation and simultaneous assimilation of lifestyles due to the transmission of cultural values [Mazurek-Łopacińska and Sobocińska 2015, p. 147];
- processes of individualization of consumption and production, which results in the creation of unique products and their search on one's own.

Factors affecting development of the information society, related to technological development include:

- rapid technological progress in the field of telecommunications hardware and equipment;
- development of technology, particularly information and communications;
- development of the Internet as a mass culture medium, distribution and communication channel;
- impact of social media on communication of individuals and speed of information flow.

The result of these processes is the development of communication, which becomes uninterrupted and mobile.

Both of these groups of factors acting simultaneously affect the activity of market participants. These include [Nawrocka 2007]:

- availability of various forms of learning;
- evolution of the cross-organizational forms of cooperation (among others towards an organization or virtual network);

- development of the service sector, including services based on the Internet;
- growing importance of specialists and scientists;
- changes in the methods of transfer of knowledge and its contents (e.g. e-learning);
- changes in the approach and organization of work (e.g. teleworking);
- development of electronic monitoring;
- realization of the idea of a learning organization at micro, meso and macro scale.

The consequence of these changes is more diverse behaviour of customers, who are more critical of the quality of the product, report complaints more readily and rapidly in the case of failure to meet standards. According to Kachniewska [2015, p. 35] the most active tourist consumer group are the involved users of new media. The media, in turn, is a platform for action of so many players that the increasingly important area of innovation implementation becomes to attract and retain users' attention. Tourists report demand for products and services tailored to their individual needs and requirements. Using the purchased products, customers express their identity and individuality. Traditional support groups, such as family, give way to increasingly new individual social relations. This process causes a retreat from mass tourism and direction toward individual tourism [Nieżgoda and Markiewicz 2012, p. 369]. A tourist tries to find themselves in the journey, looking for self-realization, eager to learn and discover new values for themselves. They look for a product that is tailored to their individual needs. It is not just about buying products, but the joy of the experience, learning something new. This leads to the dematerialization of consumption, where the purchase of products often turns into "purchase of symbols, longings, experiences, visions and dreams" [Bywalec 2007, p. 142]. A tourist turns into a traveller, and the need for individuality becomes a mass phenomenon. It should be emphasized that greater consumer awareness makes them want to regain more control over their life, limit the influence of institutions and brands through better control of what, when, where and how they consume and what they buy and from whom [*Teczka Trendów*]. Technological capabilities related to the rate of information flow are conducive to creating unique and individual service sets individually by the participants of tourism.

This is the result of the growing importance of feelings and experiences in the life of individuals of modern society. In the search for new values and ideologies, people act according to internal, own preferences and aspirations. Potential buyers need a wide range of opportunities to satisfy the needs, at the same time desiring instant access to information, booking and quick selection. The processes of globalization and the associated development of communications with wide access to the Internet cause the ease of search for offers and bookings on one's own [Nieżgoda 2013a, p. 44]. In analysing, customer behaviour, there is also a noticeable focus on the most favourable or pleasant deal with the loosening of social responsibilities and routine behaviour, which leads to a reduction in customer loyalty [Nieżgoda 1997, p. 40]. For areas of tourist reception, there is a challenge, because not only

tourism potential becomes important, but the ingenuity and creativity in the development of the tourism product.

Important changes in consumer behaviour in the tourism market caused by the information society and processes of individualization of behaviour are prosumption, co-consumption and divergence of behaviour.

## 2. Changes in the tourist market

The trend away from traditional mass production is accompanied by a simultaneous “de-massing” of marketing, trade and consumption. This is due to the phenomenon of customization (i.e., mass customization of products), involving excessive fragmentation of the market, which retains few segments or niches that are large enough to be profitable [Kotler and Trias de Bes 2004].

Changes in the sphere of consumption, which occurred in the second half of the twentieth century, concern not only modification of the objects of consumption, but also the level and manner of meeting consumer needs. The new phenomena in consumption include: heterogeneity of consumption associated with an increase in individualization and growing diverse consumer attitudes and behaviour, prosumption understood as co-creating value with customers and virtualization of consumption understood as satisfying needs through electronic media (including the Internet). In addition, an expression of criticism of mass consumption in many countries (especially in developed countries, where mass consumption led to the so-called excessive consumption), is the emergence of the phenomenon of de-consumption, understood as conscious reducing consumption to the rational size. Possession and collection of goods ceased to be a status symbol and a determinant of success in life.

In the case of conscious forming an individual product by the consumer, a process of blurring the difference between the producer and the consumer occurs, where a consumer is increasingly involved in the production process. In the context of the relationship between consumers and producers, **prosumption** takes place in a situation of matching products to the specific needs of consumers, by allowing consumers to engage in the process of designing them [Tapscott and Williams 2008]. Such thinking is possible, assuming that the products are an areas for experiments for potential customers and the market takes into account their suggestions for improvements. Therefore, customers are treated as partners [Niezgoda 2013b, p. 204]. Networks of consumers allow the use of other people’s experience and independence from information provided by a company.

Through the use of new information and communication technologies, consumers enter into new social relationships, create virtual communities for which

cyberspace is a natural meeting place to exchange information and establish lasting relationships. As part of the product co-creation by the consumer, the authors distinguish concepts such as crowdsourcing based on creating products based on the wisdom of consumers, peer production or commons based peer production – co-creation of value by the community, open innovation, the search for sources of innovation outside, Wikinomics – activities based on the principles of openness, partnership, sharing resources and action on a global scale. Sharing knowledge within the virtual reality is not a new phenomenon, created with the Internet. However, taking into account the degree of consumer involvement in the activities of the virtual reality, one can venture to say that now the Internet has become one of the most important tools, giving access to powerful information resources and enabling establishing new contacts. Mass collaboration of individuals leads to the formation of consumer groups focused on common interests and beliefs. A noticeable trend towards the creation of virtual communities refers to the eternal human need to connect in groups, do something together, seek closeness with similar people [Markiewicz 2013b, p. 190]. In addition, members of a virtual community pursue a selfish need for self-fulfilment, confirmation of their beliefs by others, standing out. The strength of these communities lies in the collective intelligence, which should not be underestimated. In the group, people are stronger and more confident about the values that unite them. Observing the behaviour of members of a virtual community can be an important source of knowledge for a tourist business. Depending on the community, a company may be its passive participant – by monitoring the opinions and anonymous participation in discussions, or it may initiate action inducing the consumer to active measures. Understanding the preferences of potential customers allows companies to offer a product or service, which to the highest extent meets their expectations. This is particularly important from the point of view of the characteristics of the tourism product, resulting from its immateriality.

With the power of the swift transmission of information through the Internet, consumers can organize themselves into groups acting as advisors. A very important process is the impact of social media on consumer choices. Lewin's thesis is confirmed (German father of social psychology, who proved the claim that individual behaviour is strongly dependent not only on one's individual characteristics, but also on one's environment) [Szymański 2010, p. 591]. Today's understanding of prosumption also refers to cooperation between many consumers who, through joint action, exchange of information and mutual assistance gain certain advantages [Staniszewski]. Prosumers can be understood as over-active consumers who use their own work, but do not see obstacles to others benefiting from the effects of their actions. Therefore it can be concluded that the opportunities offered by the rapid progress of information support the activities of individual market participants for the benefit of society.

These phenomena are closely linked to the concept of **sharing economy** or co-consumption, whose primary objective is to change the manner of use of consumer goods (earlier possession trend is supplanted by a trend to use). Therefore, we deal with the collaborative consumption, which can be defined as “an economic model based on borrowing, exchange, barter agreements or paid access to goods, standing in opposition to possession” [Botsman and Rogers 2010, p. 9]. The term co-consumption was used by Felson and Speath already in 1978, but a genuine interest in the concept was noted after 2010, when a book by Botsman and Rogers “What’s Mine Is Yours: the Rise of Collaborative Consumption” was published. The global trends in tourism demand, important from the point of view of collaborative consumption undoubtedly include: an increase in the number of consumers with sophisticated tastes who openly express their needs; constant improvement of education and qualifications by the consumer; change in lifestyle in Western society, an increasingly important role is played by individual needs; increase in customer awareness of the protection of the environment and the principles of sustainable development and growth of interest in and use of modern information and communication techniques (including the Internet) [see more: Markiewicz 2013b]. Tourists in their travels try to find themselves, look for self-realization, are eager to learn and discover new values for themselves. Increase in the awareness of environmental protection and sustainable development principles influences the choice of the place where the local population is open to arrivals and constant improvement of education and skills makes the tourists prepared to face the visited region. Technology trends mainly include: an increase in the role of information and Internet sales, and the formation of online communities and displacement by them of importance of traditional promotional portals in marketing communications. The growing role of the so-called sharing economy is noticeable as an increasing number of products and services offered according to those principles. This is undoubtedly the dominant trend in the market today.

Consumer behaviour is conditioned by the influence of social and psychological factors. The more wealthy the consumer, the stronger the impact. Therefore, the processes discussed relate primarily to countries with a high degree of economic development, and thus a high level of material security of consumers. The consumer may behave unpredictably when economic factors (income) do not limit their choices. **Divergent behaviour** is described in the literature regarding the changes in consumer behaviour. A description of the so-called “chameleon behaviour” occurs [Schub von Bossiazky 1992, p. 3], which concerns the inconsistent behaviour of a consumer who may make different choices from a variety of goods. This is due to a number of choices and exploration of new experiences. Standard projections based on segmentation processes cannot be checked [Niezgoda, Markiewicz and Gierczak 2016].

Thus, an extremely important factor in the occurrence of divergence (or convergence) is the nature of technological progress [cf. e.g. Abramowitz, 1986, p. 386; Kelly and Quah 1998].

Tourist market, even though it is governed by the general laws of the market, also shows many specific characteristics resulting from the characteristics of the tourism product and the nature of demand by tourists [Kachniewska et al. 2012, p. 116]. The most important aspects of the tourism market influencing consumer behaviour resulting from the features of the information society are:

- increasing diversity of the tourist offer;
- continuous transformation on the demand side of tourism;
- impact of different interest groups and the strong impact of the social and psychological factors on behaviour of consumers;
- changes in the environment of tourism enterprises, affecting the complex tourist product;
- far-reaching specialization and standardization in the industry;
- cultural changes and different value systems of particular social groups;
- computerization of tourism enterprises;
- diversified relationship to offer and innovation in the market of tourist services;
- evolution of needs in the tourism and recreation.

These facts confirm that the changes in contemporary society are reflected in the tourist market. To review the foregoing, the authors conducted a pilot study.

### 3. Information society on the tourist market – a case study

In order to determine the impact of the information society on the behaviour on the tourist market, the authors conducted initial pilot study. The empirical research employed the direct diagnostic survey method, using the personal interview method with the author-created questionnaire. The study was conducted in October 2015. The authors chose a representative of the hospitality industry as a subject of study (4-star hotel situated in Poznań agglomeration, where business guests represent 80% of all customers, a tour operator and a representative of catering industry – a small café in Poznań agglomeration, in which the inhabitants of Poznań constitute 80% of all clients). The questionnaire consisted of three parts. Questions in part one related to a new consumer in the context of the characteristics of the information society. The following issues were raised: an increase in the number of consumers with sophisticated tastes who openly express their needs; constant improvement of education and skills by consumers which translates into a knowledge of the purchased product; the growing importance of individualism; increase in customer awareness on the protection of the environment and the principles of sustainable



development and growth of interest in and use of modern information and communication techniques (including the Internet). The second part of the research tool referred to the ongoing enterprise activities aimed at stimulating behaviours characteristic of the information society, tackling issues such as presumption, co-consumption and divergence in consumer behaviour (creating tools giving the opportunity to contribute to the product by the consumer). The last part of the questionnaire included questions characterising the surveyed companies. Analysis of the results of the first part of the questionnaire showed that in the tourism market in all the surveyed enterprises there was noticeably more diverse behaviour of customers, who are more critical of the quality of the product. Consumers report the demand for products and services tailored to their individual needs and requirements. Consumers are creative and expect the same from companies offering products on the tourist market. For a product purchased at a travel agency, consumers are increasingly turning to the separation of services and decompose packages to suit their individual needs. They are more active, they want to change directions and get to know a new culture in their own way. There are also more professional and independent in the search for product reviews. Thanks to access to information, consumers themselves gain experience, but their requirements increase. They decompose packages also because of the price, as they are aware that the broken packages can save them money. Increase in customer awareness concerning environmental protection and sustainable development principles is manifested by choosing the places where the local population is open to arriving tourists. Tourists are interested in the authenticity of the place where they arrive, somehow they want to live by the standards of the local population, want to know the local customs, culture, religion, want to taste the uniqueness of the place they visit.

In the case of the hotel, growth of individualism manifests itself mainly in the additional services, their scope and availability for the customer. This is also reflected in the hotel catering in the form of an individual menu (e.g. vegan menu). The selection of vegan dishes testifies to increase in customer awareness of environmental protection and sustainable development principles. Consumers are increasingly opting for the products, whose preparation process is consistent with the principles of the environment and the place where a tourist has arrived. It is important in this regard that the company cooperate with local food producers (e.g. Bakoma – yogurt for guests), but also the opportunity to buy local products on site (e.g. St. Martin's croissant on St. Martin's Day – 11 November) or cooperation with local artists (exhibitions of paintings in the facility, organization of events with the participation of Polish musicians).

In the case of the studied cafe the growth of individualism is also noticeable, as well as knowledge of the purchased product, consumer's creativity and higher awareness of environmental protection and sustainable development principles.

Before they purchase the product, consumers want to get information about the ingredients used in its creation, the origin of the ingredients and the preparation process of the product. They propose new ingredients and new opportunities for product development. In all the surveyed enterprises there is a noticeable increase in interest and use by consumers of modern information and communication techniques (including the Internet). This increases consumer's awareness and knowledge in the field of the product on offer. Interestingly, in the case of one of the studied subjects, an increase in the need to use these tools was also the result of action on the side of the company. The studied tour operator changed product catalogues to the version that does not publish the details of the product concerned (the distance away from the beach, number of rooms, etc.). This forced customers to seek information on the Internet.

The studied subjects as the most important opinion portals used by consumers indicated: Holidaycheck, Tripadvisor and Bookingcom.

The results of the second part of the questionnaire showed that all tested subjects offer their customers tools for co-creation of the product. The main instruments here include enabling consumers to give opinions on purchased products on their own websites or social networks created by the enterprise (mainly Facebook). Consumers are very happy to share their opinions on the product and gladly use the opinions of other consumers. Representatives of the surveyed entities jointly identified this as one of the major changes in consumer behaviour. It is worth quoting one of the reviews (by representative of the tour operator), "in many cases, customers first check a hotel (tour) selected from the catalogue on Internet forums, then they go to the agency to properly confirm their opinion. Sometimes the employee knows that the hotel is not the best but does not have the strength to dissuade a client from the idea, because the customer is very fixed in their opinions". The quoted opinion shows how important in making a purchasing decision is the opinion of another client. Recognizing the importance of the opinion of the consumer in decision-making, representatives of the company are often involved in the interpretation or assessment of this opinion: "if the client is in the office, we often sit down together and we read and comment on the opinions of other users."

Another question in the questionnaire related to the type and speed of response to consumer feedback from the company. Analysis of responses showed that companies track customer reviews posted on the web (some of them use special tools for this purpose), almost all react to any negative opinion but also to some positive reviews. Speed of reaction is varied. In the case of the studied cafe the reaction is fastest, which is undoubtedly influenced by the size of the company. The hotel facility reacts more slowly. As the representative of the facility emphasised, before the company responds, it must thoroughly investigate the matter, find the person responsible for the company, and reflect on the way to respond to the client. In

the case of the travel agency response is quite late, which may result from the fact that it works on the principle of franchising and the party responsible for this is franchisor. It should also be noted that the response to the negative consumer feedback in many cases involves not only explaining the described disadvantage by the company offering the product, which the feedback concerns, but also offering some kind of compensation for losses incurred by the consumer. This may involve offering an additional free product (e.g. for the café studied: free coffee) or proposals for co-creation of the product (e.g. for the hotel facility: co-creation of the menu and thematic workshops for clients). The second part of the survey also asked a question concerning the use by the company of the consumer reviews. For the tour operator, a customer's negative opinion on the product which they bought does not always affect its changes. As pointed out by the representative: "Unfortunately, we are only a franchise and we cannot change the product of the tour operator. TUI imposes ways of cooperation and even when we know the opinion of the customer, we cannot change the product. We can break down the package on demand and sell it to customers. Of course, we then use the ideas of the client for other clients, we offer them "broken down" packages, but these are one-time actions, at our office, not at the level of the tour operator, in their system." For the hotel facility "every opinion and suggestion of a customer, if it is good (from the viewpoint of the facility management), it is taken into account in creating the product. This applies both to basic and additional services". As emphasized by the representative of the studied hotel, in many cases the hotel guests' proposals are "put into practice" (e.g. the idea of the menu for vegans). The results of the study conducted at the café showed that it is the operator most open to opinions and suggestions of customers. This applies to both the range of products offered here and such elements as product availability time (change of opening hours and days on request). It may be said that many of the products offered here are products created by clients of the café.

As part of the questions on the tracing by the company of consumer reviews on the Internet, the issue of a consumer as a partner in the creation of innovation in the enterprise was also addressed (e.g. the organization of competitions for the name of the product), as well as search (on the basis of opinions) for opinion leaders (brand ambassadors), and then transferring new, previously unknown by other consumers information on this product to them, due to which selected people act as advisors or experts in the dissemination of marketing information to other consumers. None of the companies surveyed indicated the need for such action. In the case of the hotel, there was a one-time competition, based on proposing the name of one of the components of the product offered by the facility, but as the representative of the facility emphasised, it had not met great interest of customers, which determined abandoning such initiatives.

## Conclusions

The pilot study showed that among consumers in the tourism market there are many of the characteristics of the information society such as individualism and the growth of diverse consumer attitudes and behaviour, creativity, higher awareness and knowledge about the purchased product, increased awareness on the protection of the environment and the principles of sustainable development, increased interest and use by consumers of modern information and communication techniques (including the Internet).

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## The use of geostatistical information to measure the spatial agglomeration in tourism in the border counties<sup>2</sup>

### Introduction

The occurrence and scale of the phenomenon of spatial agglomeration, i.e. the concentration of economic activity in certain locations is due to the possibility of the operators benefiting from the positive externalities of the concentration in regional terms [Krugman 1991; Acs 2005; Beaudry and Schiffauerova 2009; Prager and Tisse 2012]. This is of particular importance, among others, in tourism (including in the field of hotel services and catering), which is characterized by a high spatial concentration of both demand and supply, which stems from its dependence on spatially localized tourist attractions [Jackson and Murphy 2002] and its sensitivity to spatial conditions of services such as road infrastructure and neighbourhood effects, including the proximity of large urban centres and the proximity of the state border.

In studies devoted to the agglomeration phenomenon (spatial clusters of economic activity) and spatial interdependence effects between regions it is crucial to define the neighborhood of territorial units and to measure the distance between them – to determine a spatial-weight matrices. In the standard measurement procedure geometric means (centroid) of territorial units are applied, which, however, do not reflect the “real centers” of territorial units, ie. areas of concentration of a given phenomenon (eg. the intensity of tourism development). Hence, in this paper we propose the use of GPS coordinates to correct the centroid location of counties in Poland to increase the accuracy of measurement of spatial correlation phenomena in tourist regions, particularly in the border counties and identification of cross-border agglomerations.

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The specificity of the border counties resulting from their location and lack of neighbourhood of other national territorial units from the outer side of the county borders allows to observe movement (of various kinds) of geometric centres (centroids) of the territorial units in the direction of the real centres of economic activity, i.e. spatially localized clusters of enterprises. It has to do with the fact that in such areas, cities (and with them the clusters of economic activity, including in the tourism sector) may occur at the edge of the regions – they are located near the border and not inside in the middle of the territorial unit. Furthermore, main access road leads to these cities and border crossing, which is an important determinant of location of tourism economy entities, in particular catering facilities in the county. The direction and magnitude of shifts of the centres of economic activity in relation to the centroids of border counties is also affected by the occurrence and importance of tourist attractions in the region or the centripetal force of urban agglomerations. Choosing to study border counties can thus capture different types of gravity effects of location of economic entities and factors affecting the displacement of area centres.

It should be noted that tourism develops independently of the borders of the administrative division of the country into territorial units for which statistical data are collected, and therefore the area of concentration of companies in this sector and the effects of the concentration “spill over” into the adjacent territorial units (the *spillover* phenomenon) [Yang and Wong 2012; Yang and Fik 2014], thus complicating the measurement of phenomena in space. This is a methodological challenge in terms of determining ways to increase the precision of the measurement of economic phenomena in tourism, taking into account the impact of space and spatial interdependence [Carroll, Reid and Smith 2008; Brodzicki and Kuczewska 2012] – in particular with the use of neighbourhood matrices, setting out on the basis of the common territorial border or the radius of the distance between the centres (geometric, economic, administrative) of territorial units, which of them are neighbours to each other.

Due to the fact that the question of the location of economic entities is crucial in many analyses in the field of the economics of tourism, economic geography and geomarketing and at the same time, traditional ways of measuring the phenomenon of agglomeration are not adequately rewarding [Herrera, Ruiz and Mur 2013; Majewska 2015], one must seek new approaches, methods and research tools that will allow for the elimination of existing limitations. Potential in this scope results from the dynamically developing geographic information system (GIS), and the ever wider use thereof in empirical studies in different applications [Van der Knapp 1999; Longley et al. 2008; Stimson and Haynes 2012; McArdle et al. 2014], as well as increasing quantity and quality of spatial data collected in big sets (*spatial big data*) [Schabenberger and Gotway 2005; James and Campbell 2014]. Applying these approach can improve the results of spatial and economic analyses, in varying

degrees and scope. Particularly useful for the determination of central tendencies in gravity modelling [see Chojnicki 1966, 1999; Anderson and van Wincoop 2003; LeSage and Thomas-Agnan 2015] may be GPS coordinates, the use of which will enable modifying the position of the centroids and thus correction of neighbourhood matrices used in the statistics of the spatial autocorrelation [Majewska 2016].

The use of GIS can indicate centres of economic activity in the counties, in particular border counties. If cross-border cooperation is active, this should be reflected in the fact that the mean values of coordinates, indicating the central tendency of firms localised in particular counties (centres of economic activity) move toward the border. At the same time, considering that the rules of neighbourhood used in the local Moran statistics (and other indicators of spatial association) often operate on the distance between the centroids of adjacent objects (territorial units) [Anselin 1995; Schabenberger and Gotway 2005; Suchecki 2010; Lloyd 2010; Suchecka 2014], the shift in the direction of the border will cause the territorial units on both sides of the border more likely to be considered neighbours. This will allow to observe the phenomenon of spatial agglomeration in the international context (cross-border agglomeration). On the other hand, if the cross-border cooperation is not active and the border is not a centre of gravity for the location of businesses, the mean values of the coordinates determined for entities registered in individual counties will not move in the direction of the border (and maybe even move away from it). Then there is no phenomenon of agglomeration in the international perspective.

This article is the first step in identifying the phenomenon of cross-border agglomerations, which examines – based on the borders of western and eastern Poland – whether and with what force the border is a factor in attracting the centre of economic activity, but only in relation to the Polish counties. The next step would be to complete these studies with similar studies of border counties in neighbouring countries, in order to determine whether those territorial units experience the shift of centres of economic activity towards the border. Subsequently, it should be examined whether the spatial autocorrelation of the counties on both sides of the border are statically significant.

The goal of the paper is to examine the usefulness of geostatistical information (GPS coordinates) in measuring the phenomenon of spatial concentration of economic activity – on the example of Polish cross-border districts. We employ spatial statistics along with several visualization techniques. We used data collected by Polish Central Statistical Office at NUTS-4 level with regards to individual entities being tourism firms registered in section I according to Polish Classification of Activity (PCA) – accommodation and catering services (division 55 and 56 respectively) in 2015. We derived and used the total number of 4,341 GPS coordinates that reflect localization of firms registered in section I in eastern and western cross-border Polish districts.



## 1. The phenomenon of spatial agglomeration in tourism, measurement of interdependance and application of GIS in spatial studies

Major susceptibility of both the supply and demand aspects of tourism to spatial concentration justifies studying the phenomenon of agglomeration in this sector [Carreras 1995; Hjalager 2000; Jackson and Murphy 2002; Yang 2012]. This is due to the inherent characteristics of the entities of the tourism economy, such as the fragmentation of activity, its subjective and spatial differentiation, as well as the existence of links between these entities (social and business networks), which favours the processes of spatial agglomeration [Sørensen 2007; Capone and Boix 2008]. The specific location of businesses can influence the scope and scale of profitability of hotel and catering businesses in connection with the broadly defined monetary and non-monetary benefits of agglomeration [Duraton and Puga 2004].

Spatial correlation can however be grasped on the basis of local spatial autocorrelation statistics [Anselin 1995; 2010], which examine the statistical significance of the similarity of adjacent territorial units due to a particular characteristic (e.g. tourism) and indicate whether there is a spatial agglomeration effect [Kopczewska 2011; Mora and Moreno 2010]. These statistics allow to capture the occurrence of spatial relationships – correlation of variables with respect to spatial location, i.e. whether geographically close observations are more similar to each other than the distant ones. A useful tool in this regard (in the so-called LISA – *Local Indicator of Spatial Association*) is Moran's  $I_i$  statistic being weighted correlation coefficient used for detection in the random distribution of the variable  $\mathbf{X}$  of deviations with spatial characteristics. It allows to determine whether neighbouring areas are more similar to each other (in terms of variable  $\mathbf{X}$ ), than would result from the stochastic nature of the phenomenon studied [Suchecky 2010, p. 113; Mora and Moreno 2010, p. 321]. Moran's  $I_i$  statistic is expressed by the following formula [Kopczewska 2011, p. 90]:

$$I_i = \frac{(x_i - \bar{x}) \sum_{i=1}^n w_{ij} (x_j - \bar{x})}{\sum_{i=1}^n (x_i - \bar{x})^2 / n}, \quad (1)$$

where:

- $x_i(x_j)$  – value of the variable  $\mathbf{X}$  in the region  $i(j)$ ,
- $n$  – number of regions,
- $\bar{x}$  – the arithmetic mean of the variable  $\mathbf{X}$ ,
- $w_{ij}$  – elements of the spatial weights matrix  $\mathbf{W}$  (line standardization) between units  $i$  and  $j$ .

The matrix of spatial weights (neighbourhood matrix)  $W$  is the matrix whose elements take the values:

$$w_{ij} = \begin{cases} 0 & \text{when regions } i \text{ and } j \text{ are not neighbours,} \\ 1 & \text{when } i \text{ and } j \text{ are neighbours.} \end{cases} \quad (2)$$

By determining local Moran's  $I_i$  statistic one can take various patterns (types) of neighbourhood. As shown by Griffith [after: Suhecka 2014, p. 170] there are different ways of defining the neighbourhood and construction of a spatial-weight matrix. These methods depend, among others, on the assumed purpose of the study, the degree of knowledge of the study area and its geographical conditions. For the area data, the most commonly used concept of neighbourhood is called neighbourhood by adhesion (contact), or neighbourhood defined by the common border of territorial units. There are three types of configuration of adjacent objects [see Baris et al., after: Suhecka 2014, p. 175]: the queen, bishop and rook. In addition, the neighbourhood is defined, among others, by a minimum number of  $k$  nearest neighbours, or the maximum distance between the areas (set radius  $d$ ). In the latter case the neighbours are regions where the distance between the centroids of counties, that is, their geometric centres, regional capitals, centres designated on the basis of location data of entities (GPS coordinates), etc. does not exceed a specified number  $d$  of km.

It should be noted that determining the neighbourhood of regions is an objective methodological problem in the application of measures of spatial autocorrelation, and there is no consensus as to the adequacy of their choice [Carroll, Reid and Smith 2008; Suhecki 2010]. As a result, the assessment of the presence and strength of the real spatial concentration processes may be subject to considerable bias – e.g. if the neighbourhood is determined based on a specified length of radius measured by the distance between the centroids units.

Therefore, to increase the precision and reliability of analyses of the phenomenon of spatial agglomeration in tourism, one should look for other ways to determine the neighbourhood of regions. Geostatistical information and location data of entities of tourism economy (GPS coordinates) may be helpful in this regard, since on their basis new centroids may be designated for individual territorial units – depending on the location of these entities in relation to tourist attractions and not the position of the territorial units themselves.

## 2. Sources of data and research method

The study used the data acquired from the Polish Central Statistical Office (CSO) on economic entities registered in the REGON system in Section I of Polish Clas-

sification of Activity (PCA) (Accommodation and Catering Services – respectively division 55 and division 56) in Poland in 2015. In 2015 in this section were registered 131,338 companies, including 34,563 in division 55 (accommodation) and 96,775 in division 56 (service activities related to catering). Figure 1 shows the spatial distribution of economic entities registered in Section I of PCA in 2015 in Poland.

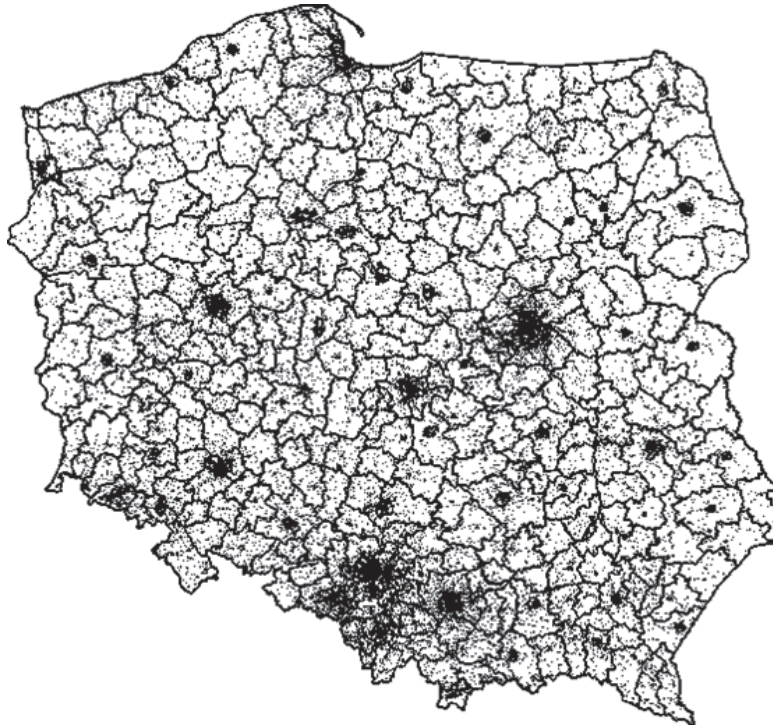
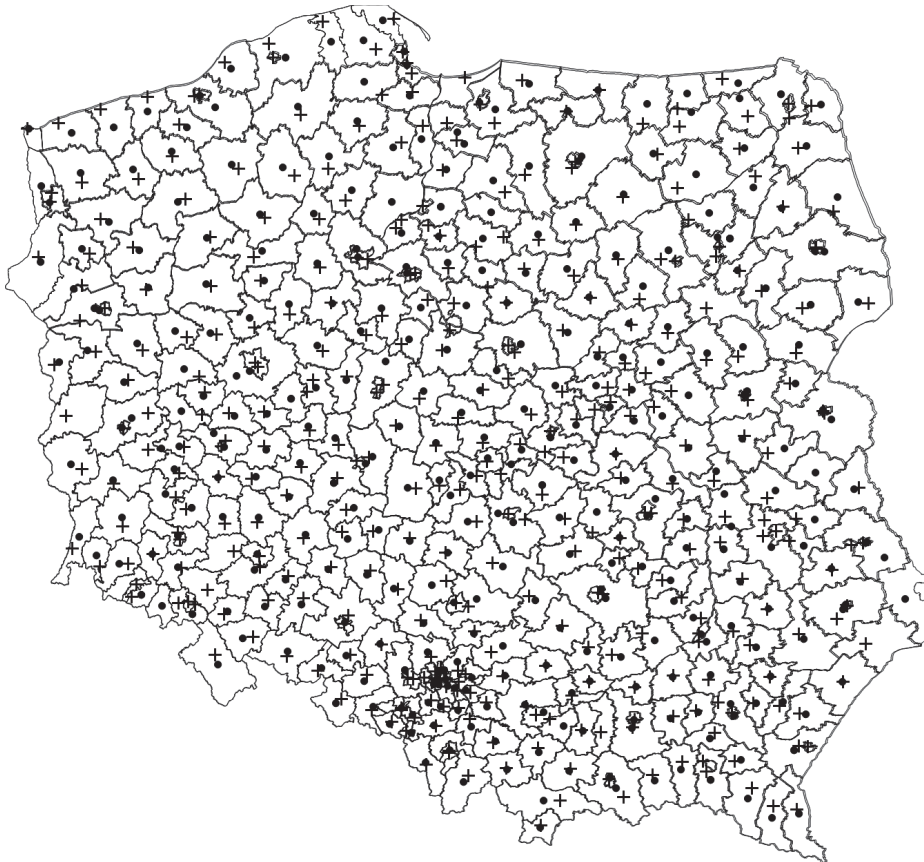


Figure 1. The spatial distribution of economic entities registered in Section I of PCA in 2015 in Poland

Source: Own study based on data from the REGON registry (CSO 2015) using MapViewer software

The research was narrowed to a group of 4,341 companies registered in the western and eastern border counties in Poland, including 1,196 of them registered entities in section 55 and 3,146 – in section 56. The study did not include the counties along the northern and southern border of the country due to the dominance of natural conditions as tourist attractions among the factors of the “gravity” of centres of economic activity in the border counties. Coastal areas are characterized by a strong shift of clusters of tourism economic entities in the direction of the sea border, while in mountain areas shifting of centres of economic activities in tourism can be observed into hinterland. This makes it impossible to determine the existence and strengthens of the effects of gravity assumed in the article, for other factors that influence the processes of spatial agglomeration in the border regions.

Several stages of research procedure have been conducted. In the first phase of research, on the basis of postal addresses of companies location data (GPS coordinates) of business entities registered in Section I were acquired. This was followed by the visualization and analysis of the spatial distribution of GPS coordinates in Polish counties. In the next step, using gravity models the central tendency for location of tourism entities was set in individual counties. For each county, the average value of the longitude and latitude of the enterprises located in their administrative boundaries were calculated [see Lloyd 2010], assuming that the average values of these coordinates define tourist agglomeration centres (of economic activity) in individual Polish counties. The map below (Figure 2) shows the average values of GPS coordinates of the respective counties (central tendency) and the centroids of the counties.



Note: the black points – centroids of counties; points labeled as “plus” – average GPS coordinates (the central tendency) of firms registered in Section I of PKD

Figure 2. Spatial deviations of agglomeration centres (the central tendency of tourism economic entities) and the centroids of counties in 2015 in Poland

Source: As in Figure 1

Then, these values were compared with the coordinates defining the position of the centroids of counties in Poland, which were generated using the graphics software MapViewer to create thematic maps. In this way, the direction and scale of shifting centres of economic activity in the border counties with respect to centroids of these counties were determined, and the importance of the border as a factor of gravity for concentration of tourism firms was assessed.

### 3. The research results

Based on the determined average values of GPS coordinates of entities registered in individual counties in Section I division 55 (accommodation) and division 56 (service activities related to catering) and information about the location of centroids (geometric centres) of counties, the size and direction of movement of these points relative to each other was calculated, providing the nature and gravity of state border and other factors in the agglomeration processes in the border counties. The data shown in Table 1 indicate that the centres of economic activity of the counties on the western border, as measured by the average coordinates of objects in Section I, move to the west compared to the geographic centres of counties in most cases. The biggest shift is taking place towards the west.

Table 1. Shifting the average coordinates of firms in Section I in given border counties as compared to the centroids of the respective border counties on the western border

County code	County name	Weight	Shift in degrees of longitude (weighted)			Shift in km (accommodation)
			total	accommodation	catering	
225	Zgorzelecki	1.83	0.13	0.12	0.13	8.20
801	Gorzowski	1.00	0.16	0.17	0.15	11.58
802	Krośnieński	1.37	0.16	0.12	0.17	8.56
805	Ślubicki	2.03	0.10	0.16	0.08	11.04
811	Żarski	1.67	-0.20	0.03	-0.23	-1.98
3206	Gryfiński	1.32	0.04	0.10	0.02	7.04
3210	Myśliborski	1.16	-0.10	-0.18	-0.08	-12.19
3211	Policki	3.04	-0.09	-0.06	-0.12	4.38
3263	Świnoujście	4.47	0.34	0.36	0.33	24.48

Note: Positive sign means moving average coordinates of tourism firms compared to the centroids of counties to the west, and the negative sign to the east.

Source: Own study based on data from the REGON registry (CSO 2015).

Due to the diverse parallel extent of the counties, shifts of mean coordinates were weighted to make them more comparable<sup>3</sup>. It may be noticed that the largest shift

<sup>3</sup> The individual counties have been given weights indicating how many times the latitudinal extent of the county is less than the longest of the counties in the set (which was given a weight of 1).

to the west was recorded in Świnoujście county, then Gorzowski and Słubicki counties. On the other hand, in Policki and Myśliborski counties, centres of economic activity shifted eastward.

Due to the diversity of determinants causing shifts shown in Table 1 in individual counties, below are presented in more detail the ones related to the border location of the counties. Figure 3 shows the north-west counties, such as Świnoujście, Policki, Gryfiński, Myśliborski and Gorzowski.

In the case of Świnoujście county, there is a clear concentration of catering facilities in Świnoujście, resulting in the focal point of economic activity moving northwest with respect to the centroid of the county. Although the shift to the west in the case of this county is, after weighting, the largest, it should be noted that the main factor attracting catering facilities to Świnoujście is the sea, and not the German border and border crossings to Ahlbeck and Garz<sup>4</sup>, although, as mentioned above, the location of one of the main towns of the subdivision on the edge of it is specific to the border units.

The specificity of Policki county is a strong concentration of catering facilities in Police and in the urban agglomeration of Szczecin, causing slight shift of the centre of economic activity to the east of the county. The influence of the western border is visible as the concentration of catering facilities along the national road No. 13 Szczecin – Kołbaskowo in the southern part of the county and the national road No. 10 Szczecin-Lubieszyn to the border crossing Lubieszyn-Linken in the western part of the county.

Due to the shape of Gryfiński county, the largest border crossing – Gryfino is not to the west, but rather to the north of the county. As a result, the shift of mean coordinates of catering facilities to the north approaches the centre of economic activity to the border. In addition, the shift in a westerly direction is affected by the location of the catering facilities along the road to Cedynia and the border crossing at Osinów Dolny. In turn, the catering facilities located along the road E65 Szczecin – Gorzów reduce the shift of mean coordinates in a westerly direction.

Myśliborski county is a county in which the shift to the east of the centre of economic activity in relation to the centroid is the highest among the counties on the western border. This is due to the lack of border crossing in this district. Therefore, similar to the counties within the country – catering facilities are located in big cities and along the course of the roads (e.g. E65). The only manifestation of the concentration of catering facilities related to the border is a noticeable mark on the map of the road Szczecin – Kostrzyn.

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<sup>4</sup> All coastal counties show a very strong shift of the mean coordinates of tourist facilities in the direction of the sea.



Note: Triangles – centroids of the counties; crosses – mean coordinates of catering facilities in the county

Figure 3. Distribution of catering facilities in the border counties (North-Western Poland)

Source: As in Figure 1

The centre of economic activity of Gorzowski county is the result of two forces – Kostrzyn to the west and the area of Gorzów Wielkopolski in the east of the county. The largest shift westward of mean coordinates for catering facilities among the counties on the western border proves a stronger impact of Kostrzyn.

Figure 4 shows distribution of catering facilities in the border counties on the southern course of the western border.



Note: The markings as in Figure 3

Figure 4. Distribution of catering facilities in the border counties (South-Western Poland)

Source: As in Figure 1

Słubicki county shows a large shift to the west of mean coordinates of catering enterprises, which are located in Słubice. This shift is offset by the concentration of catering facilities in the other major cities of the county and along the access roads to the border crossing.

Krośnieński county is similar to Gorzowski county – the two main forces determining the concentration of economic activity are Gubin in the west and Krosno



in the east. Relatively large shift of the mean coordinates west shows that also in this county there is the stronger influence of the border town. There is a different result of the relative gravity of the border crossing and the capital of the county in Żarski county, in which the centre of business activity is in the neighbourhood of Żary, not the border crossing in Łęknica. In addition, noteworthy is concentration of eateries along the course of the national road No. 12 Trzebiel – Łęknica.

The last county on the western border is Zgorzelecki county. In relation to the centroid, the mean coordinate of catering facilities is located in the west – in the town of Zgorzelec, although the shift compared to other counties is not very high due to the fact that part of the county – Turoszów area – is more to the west than the largest border crossing the county.

Table 2 shows the shift in mean coordinates of entities in Section I with respect to the border centroids on the eastern border. In contrast to the counties on the western border it may be noted that the border crossings on the eastern border do not cause displacement of centres of economic activity in the direction of the border, and the most common cases are shifts into the country. Shifts towards the east can be seen above all in the case of Włodawski and Hajnowski counties. The biggest shift in the direction of the west characterise, in turn, Sejneński, Chełmski and Tomaszowski counties.

Table 2. Shifting the mean coordinates of facilities in Section I as compared to the centroids of border counties on the eastern border

County code	County name	Weight	Shift in degrees of longitude (weighted)			Shift in km (accommodation)
			total	accommodation	catering	
601	Biański	0.92	0.07	0.10	0.06	9.70
603	Chełmski	1.05	0.17	0.34	0.13	33.93
604	Hrubieszowski	1.72	-0.03	-0.02	-0.03	-1.52
618	Tomaszowski	1.02	0.12	0.22	0.10	22.11
619	Włodawski	1.47	-0.08	-0.18	-0.03	-17.93
1801	Bieszczadzki	1.22	0.00	-0.01	0.01	-1.34
1804	Jarosławski	1.29	0.08	0.16	0.07	15.96
1809	Lubaczowski	1.28	-0.01	-0.01	-0.01	-1.14
1813	Przemyski	1.15	-0.05	-0.03	-0.05	-3.51
2001	Augustowski	1.00	0.10	0.08	0.10	8.52
2002	Białostocki	0.68	0.06	0.09	0.05	9.17
2005	Hajnowski	1.35	-0.15	-0.20	-0.05	-20.64
2009	Sejneński	2.28	0.25	0.57	0.00	57.89
2010	Siemiatycki	1.16	0.04	0.06	0.03	6.39
2011	Sokólski	1.00	0.06	-0.02	0.10	2.34
2012	Suwalski	1.52	-0.11	-0.09	-0.13	-8.96

Note: positive sign means shift in the mean coordinates of facilities compared to the centroids of counties to the west, and the negative sign to the east.

Source: As in Table 1.

Figure 5 shows the locations of the various catering entities in the border counties on the eastern border with centroids of the counties and mean coordinates of catering facilities.



Note: The markings as in Figure 3

Figure 5. Distribution of catering facilities in the border counties (Eastern Poland)

Source: As in Figure 1

In contrast to the western border, there is no big impact on the location of entities in Section I at the border crossings. Both in the case of border crossing in

Korczowa (Jarosławiecki county), in Dorohusk (Chełmski county), and Terespol (Bialski county) the greater impact on the placement of business entities in Section I characterises capitals of the counties. Only in the case of Przemyski county, the shift toward the border and border crossing in Medyka can be noted, but it is the effect of concentration of economic entities in the area of Przemysł visible on the map, located within the eastern part of Przemyski county.

Similarly, in other counties, where the mean coordinates of catering entities are shifted to the east relative to the centroids of the counties they are not the result of the presence of the border. In Włodawski county, the centre of concentration is Włodawa – the largest city on the eastern border, but without the border crossing. Concentration of catering facilities in the east of Hajnowski county is also not associated with the nearby border, but rather with attractive tourist destination of Białowieża Forest. On the other hand, in the case of Suwalski county, the shift of mean coordinates to the east is the result of impact of Suwałki, with the result that the centre of economic activity is further away from the border than the centroid of the county (due to the simultaneous shift to the south).

## Conclusions and directions for further research

As part of the research presented in the article, using geostatistical information in the form of GPS coordinates, the diagnosis of directions and gravity for location of businesses of the tourism sector registered in the border counties of western and eastern Poland was performed. It aimed to identify the relative determinants of the diversity of distribution of companies in section I of PCA in the space delineated by the administrative borders of counties and their grouping in the centres of economic activity. These factors include primarily the proximity of urban centres, proximity to the border and border crossings, as well as the presence and importance of tourist attractions and access roads.

It should be noted that in the case of territorial units economic centres (spatial clusters of tourism firms) are situated close to the geometric centre of the counties. Meanwhile, the shifts of the mean coordinates of tourism firms in the counties reflect the town location relative to the centroid, when it is not interfered with by the presence in the proximity of some tourist attractions or any other factor affecting the size and location of clusters of businesses. From this point of view there are three types of counties: counties influenced by seaside location of a subdivision, large cities and urban agglomerations in the vicinity of the county, as well as border areas, in which the towns are located. The activity of cross-border cooperation results in the development of border towns and attracting businesses, creating a cluster – a centre of economic activity. On the basis of the adopted research method, one

can indicate which of the centres of gravity is stronger. It was found that where cross-border cooperation is more active (e.g. where Euroregions operate and there is free movement of people), a stronger magnet is the proximity to the state border. Then a typical cooperation centre are border cities.

The stronger gravity of the border – the shift of mean coordinates of the tourism businesses to the west mostly took place in the counties of the western Polish border, except Policki (due to the geographical proximity of Szczecin), Żarski and Myśliborski counties, in which the distribution of activity is similar to counties other than border, the reason for which may be the lack of an important border crossing on its territory. Gravity of the border is due to the presence of border towns and the lack of major tourist attractions, which would compensate for the effect of gravity. However, the results in some cases are disrupted by the placement of businesses along the roads, which can “pull them away” from the border.

In contrast, in the eastern regions economic centres are formed away from the border, which is not a force attracting location of tourism economic entities, which is associated with a lack of border towns. Clusters of tourist businesses form around the tourist attractions (Włodawa, Lake Wigry or Białowieża).

Further research should aim to identify the presence and size of cross-border agglomerations and in particular to determine whether the distance between the centroids of the counties on both sides of the border are higher than among the centres set using GPS coordinates of the centres of economic activity of these counties. It would be important at the same time to determine whether the approach of the economic centres to the border takes place to the same extent on both sides of the border – in Poland and abroad.

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## Effects of individual and organizational factors on employer image: A case of the tourism industry in Poland<sup>2</sup>

### Introduction

In today's economy, characterised by increasingly fierce competition, employees are focal to the process of service brand building. Growing recognition of the significance of the customer-employee interaction in the service delivery has resulted in an intensified awareness amongst practitioners and researchers to better appreciate how to recruit employees who are committed to the set of values and organizational goals of the company [Grönroos 1994; King 2010]. If companies wish to gain a competitive advantage through attracting and retaining the best available human capital, they should engage in the process of placing an image of being a great place to work in the minds of current and potential hires. This can be done effectively when organizations are aware of the factors that are most important for job-seekers and of the image their industry presents to employees.

The role of the service provider in the consumer's evaluation of the service experience is indisputable. Personnel's attitudes and behaviours have both short-term and long-term impact on how clients perceive the service organization. Employees represent the organization to customers, engage in interpersonal interactions with them, are important sources of information about their requests and complaints, therefore undeniably contribute to service delivery excellence [Bettencourt and Brown 1997; Kuslivan et al. 2010]. This is why service companies must take measures to effectively manage their service providers to ensure that their attitudes and behaviours are commensurate with customer relationship objectives [Hartline and Ferrell 1996; Brown and Lam 2008].

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A substantial impact of employees on the service organization's performance has been confirmed by numerous investigations run within the service profit chain framework. The research has diagnosed causal links between employee satisfaction and positive workplace attitudes, behaviours, and performance outcomes both at the individual and the unit levels [Heskett et al. 1994; Yee, Yeung and Cheng 2011]. Findings of these studies support a company's efforts to communicate to existing and prospective staff that it is a desirable place to work – implementing strategies to shape the company employment image helps recruit high-performing and committed employees who will contribute to the efficient and effective delivery of services and to the market success of the organization.

Since employees' effort and loyalty are affected by organization's ability to reciprocate with material and socioemotional benefits [Aselage and Eisenberger 2003], the image of employment is regarded as a significant determinant of the effective recruitment of quality labour [Riley, Ladkin and Szivas 2002]. This study seeks to contribute by recognizing the dimensions of employer image in the tourism industry and by identifying factors which influence the perception of the tourism organization attractiveness as a workplace from potential employees perspective. Employer image has been examined using different operationalizations [Ployhart 2006]. For the purpose of this study it has been operationalized in line with person-environment fit perspective as the discrepancy between preferred and perceived job and organization attributes. The paper opens by reviewing the literature on the employer image in the tourism market. Then the findings of the study on the students' perception of the attractiveness of career in tourism are presented. Finally, the overall implications and recommendations for future research are proposed and the main conclusions reached are summarised.

## 1. Tourism employer image – background and research hypotheses

Each company deals with numerous stakeholders, who develop various relationships with and hold various impressions of the organization. As a result each company has a bundle of images. There seems to be a general consensus that employees are a key stakeholder group, who co-operate with customers, suppliers, and other stakeholders to co-create value. Both current and potential employees have opinions and beliefs about the company's attractiveness as a place to work. These impressions are labelled in the literature as company employment image [Highhouse et al. 1999; Lemmink, Schuijf and Streukens 2003], employer brand image [Collins and Stevens 2002; Knox and Freeman 2006] or employer image [Lievens, Van Hoye and Anseel 2007; Van Hoye et al. 2013]. A closely related concept, which is often used interchangeably with employer image in scientific and practitioner



literature, is employer attractiveness [Christiaans 2013]. Employer attractiveness is understood as the envisioned benefits offered by a specific organization to its personnel [Berthon, Ewing and Hah 2005].

The considerations on employer image and employer attractiveness are conceptually supported by signalling theory [Rynes, Bretz and Gerhart 1991; Turban and Cable 2003; Wilden, Gudergan and Lings 2010]. The theory posits that labour market is characterised by information asymmetry and, consequently, hiring decisions are taken under uncertainty. Prior to commencing a job, a potential employee cannot assess the quality of working conditions, nor an employer is sure of the capabilities of an individual at the time they hire them. Given the long-term consequences of employment contracts for both parties, it is in the best interests of a potential employee to invest effort into gaining information about a prospective employer, and for a prospective employer to signal to the labour market their characteristics. Job seekers interpret available data as signals of working conditions in the organization and use them to assess the appropriateness of the employer.

In early recruitment stages applicants have only some elementary knowledge of potential jobs and organizations they generate for future consideration. Consequently initial intentions to pursue employment opportunities at a particular firm are based on general impression of company's attractiveness as a place to work [Highhouse et al. 1999]. Those impressions are affected by the industry in which a firm operates [Cable and Graham 2000]. Thus, companies must be aware of inter-organizational interdependence which influences their reputation due to spill-over effects [Barnett and Hoffman 2008]. Employer desirability is evidenced to depend on being embedded in the right industry, what is more, this link is stronger when applicants' familiarity with company is limited [Burmam, Schaefer and Maloney 2008; Wilden, Gudergan and Lings 2010]. Such situation is fairly common in the tourism sector, which hires a significant proportion of newcomers without professional experience [Riley, Ladkin and Szivas 2002] and which is fragmented and dominated by small and medium sized enterprises [Riley 2004]. Given the critical role of the industry image, the need to explore potential employees' opinions and beliefs about tourism career attractiveness is becoming evident. Job seekers comprise an important stakeholder group that is argued to be the subject of scarce research [Cable and Graham 2000].

The career choice behaviour of tourism and hospitality students and their attitudes and perceptions of job prospects in tourism has been addressed in relatively few studies. In recent years, however, it has received an increasing attention in both the practitioner and academic literatures, which is stimulated by the fact that tourism organizations across the world face the growing problem of attracting and retaining employees with proper knowledge, skills, experience, creativity, involvement and commitment [cf. Kusluvan and Kusluvan 2000; Maxwell, Ogden and Broadbridge 2010; Bednarska 2013; Brown, Thomas and Bosselman 2015].

Research carried out in Europe, Asia, America, and Australia revealed the dichotomy regarding the image of the industry. In their investigation of students enrolled in tourism and hotel management studies in Turkey, Kusluvan and Kusluvan [2000] identified that disadvantages of working in the tourism industry outweighed advantages. Respondents evaluated unfavourably wages level, promotion opportunities, qualifications of managers and co-workers, work-life fit, and physical working conditions; on the other hand the majority of them regarded job as being interesting. Similar conclusions were drawn by Barron et al. [2007]. They examined work experiences of students in United Kingdom, who pointed out both positive and negative attributes of working in the hospitality industry. Positive aspects included social nature, prospects for career advancement, and interesting experiences via the rapidly changing sector; negative factors centred on the level of reward, antisocial hours of work, and lack of appreciation displayed by managers. Rok [2013], in her research of students' perception of work environments after their internships in the tourism and hospitality industry in Slovenia, reported that respondents were satisfied with the amount of autonomy received and relationships with co-workers. At the same time they complained about poor promotion chances, awards and other investments in human resources as well as exposure to a lot of stressors. Richardson and Thomas [2012], who studied opinions on a number of dimensions relating to careers in hospitality and tourism in United States, found that students believed that the industry was a well-respected field, although it needed to address the issue of remuneration and promotion opportunities.

The negative image that discourages from planning long-time career in the tourism industry was diagnosed in the research carried out by Jiang and Tribe [2009] in China. Interviewed students reported that, due to instability, low incomes, repetitive tasks, unfavourable physical working environment, limited promotion opportunities, incompetency of management, and low social status, they considered tourism jobs as the first stepping-stone to a career elsewhere. These results correspond with Richardson and Butler's findings [2012], who investigated attitudes towards tourism-related jobs of undergraduates in Malaysia. Their general conclusion was that students did not trust an employment in the sector would offer them the factors that they found important in job choice.

Considerable stream of research highlights that the negative image of the industry held by hospitality and tourism students appears to be developed with the increase in the exposure to working life in the industry through a part-time employment and student placements [Roney and Öztin 2007; Jiang and Tribe 2009; Richardson 2010]. As a result many undergraduates do not plan to pursue a job in tourism upon graduation or leave the industry within a few years [Maxwell, Ogden and Broadbridge 2010; Koc et al. 2014]. As noted by Kusluvan and Kusluvan [2000] this tendency may imply undesirable consequences for the students, the tourism industry, and the government.

A large body of work has focused on the overall employer image in the tourism industry; however, many questions about differences in assessment of organization attractiveness as a workplace remain almost completely unaddressed. While the influence of individual factors on attitudes towards tourism-related careers has been explored in several studies [Roney and Öztin 2007; Koyuncu et al. 2008; Wan, Wong and Kong 2014], the perceived importance placed upon objective organizational factors is poorly represented in research on job choice in the tourism sector. Such characteristics, being visible to job seekers, might be interpreted as signals of organizational culture and, therefore, affect applicants' attitudinal judgments about a company as a potential employer [Lievens et al. 2001]. Given the heterogeneity of tourism supply, the shortage of empirical investigations in this field is quite surprising.

Consistent with person-environment fit perspective, potential employees' beliefs about the company's attractiveness as a place to work are posited to correlate with subjective assessment of the compatibility between an individual and a work environment. Previous studies provide evidence that congruence between career aspirations and work environment characteristics may significantly influence applicants' job search and choice decisions [Lievens et al. 2001; Yen, Murrmann and Murrmann 2011]. The degree to which rewards in the workplace are believed to fulfil the needs of the individual appears to be particularly important in the job choice context. As Backhaus and Tikoo [2004] noted, applicants are attracted to a company based on the assessment of firm's employment related characteristics and the importance they place on those characteristics. This is the reason why the study investigates simultaneously potential employees' expectations towards careers (preferred job/organization attributes) and perceptions of tourism careers (perceived job/organization attributes) and refers to the mismatch (gap) between these two constructs. Such an approach enables to assess subjective fit [Kristof-Brown, Zimmerman and Johnson 2005].

It is argued in the paper that both individual and objective organizational aspects should be taken into consideration when exploring factors which influence employer image in the tourism industry. Prior research has emphasised the role of gender as a moderator of potential employees' expectations towards work and job search behaviour [Rynes, Bretz and Gerhart 1991; Thomas and Wise 1999]. Year of academic programme and work experience in tourism have been shown to have significant relationships with commitment to careers in tourism [Kusluvan and Kusluvan 2000; Richardson 2010; Wan, Wong and Kong 2014]. A desire to study tourism has been evidenced to contribute positively to the overall image of the industry as a workplace [Roney and Öztin 2007].

Company size is recommended to be included in organizational attractiveness research as small and large employers, due to resources availability and institutional pressures, are likely to provide different working conditions and follow different human resources management practices [Barber et al. 1999; Walmsley, Thomas and Jameson 2006]. The level of internationalisation, chain affiliation, and ownership are

also important objective characteristics that act as indicators of company's cultures and values. The presence of organization's divisions which are dispersed across different countries signals to prospective employees that overseas assignments may be common [Lievens et al. 2001]. Being a part of a chain may suggest relatively strong internal labour markets, hence career development and promotional opportunities [McPhail and Fisher 2008; Gunlu, Aksarayli and Perçin 2010]. According to Lansberg [1983] due to inherent incongruities between the norms and principles that shape relations in the family and those that operate in the business, the management of human resources in family organizations faces challenges with regard to selection, compensation, appraisal, and training. These problems may affect the perceived attractiveness of family firms as employers. Finally, type of service offering is argued to be linked with the employer image in the tourism industry as various economic activities serving visitors for and during tourism trips differ in both intrinsic and extrinsic job and organization characteristics (job content and job context).

Based on the above discussion, the following hypotheses are developed:

Hypothesis 1: Gender, study degree, year of study, attitude to tourism studies, and work experience are related to the gap between preferred and perceived job/organization attributes, hence have effect on the tourism employer image.

Hypothesis 2: Company size, level of internationalisation, chain affiliation, ownership, and type of services offered are related to the gap between preferred and perceived job/organization attributes, hence have effect on the tourism employer image.

Aforementioned hypotheses are summarised in the conceptual model presented in figure.

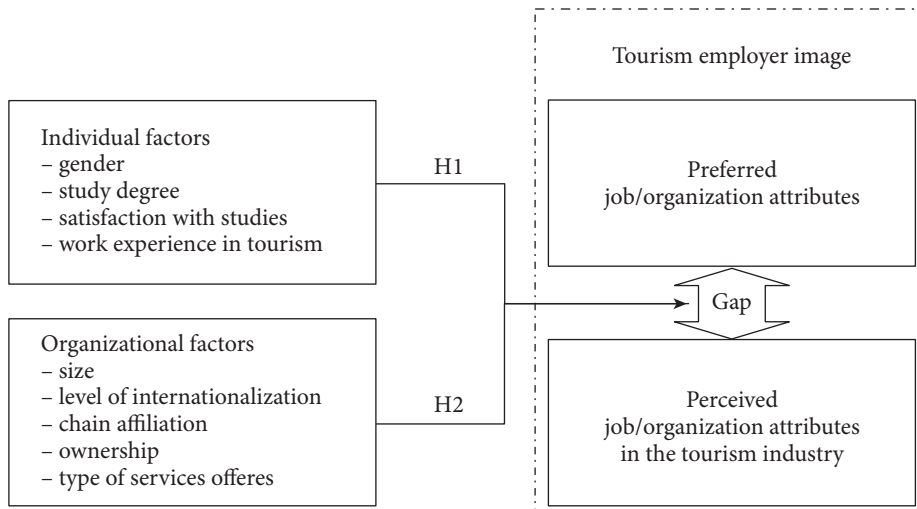


Figure 1. Conceptual framework

## 2. Research method

In order to reach the objectives of the study and to test proposed hypotheses empirically, field investigation was conducted. The target population comprised undergraduates and graduates enrolled in tourism and hospitality studies in Poznań, which is one of the leading centres for higher education in Poland. Twenty-four institutions of tertiary education are located there with almost 110,000 students [Główny Urząd Statystyczny 2015]. Eight public and private universities in Poznań offered bachelor and master degrees in tourism and a total of 4,000 students took tourism and hospitality courses. To obtain a representative subset of the target population a single-stage cluster sampling was employed.

A measurement instrument for the research was developed by applying deductive approach. The basis for the analysed variables operationalization were the findings of several empirical studies on dimensions of employer image and employer attractiveness, namely Bednarska and Olszewski [2012], Berthon, Ewing and Hah [2005], Knox and Freeman [2006], Kusluvan and Kusluvan [2000]. Participants rated a range of 17 items displaying 5 dimensions of the company employment image, i.e. job content (3 items), economic value (4 items), social value (4 items), development value (4 items), and flexibility (2 items).

The questionnaire consisted of three main components. Respondents were requested first to envisage an ideal employer and evaluate the image dimensions based on their expectations. In the second section they were asked to assess the analysed attributes regarding employers in the tourism industry. The data enabled to compute the gaps between preferred and perceived job/organization attributes, which are dependent variables in the study. The gap was calculated as a difference between expectation and perception for desired attributes and as a difference between perception and expectation for undesired attribute. Accordingly, a positive number denotes unmet expectations, a negative number denotes exceeded expectations. To test the effects of objective organizational factors on perceived organization attractiveness five versions of questionnaire were prepared – participants were to compare small with large firms, national with international firms, independent with chain-affiliated firms, family with non-family firms, and tourism service suppliers with tour operators and travel agents. Section three sought information about students' willingness to search for a tourism-related job, their age, gender, year of study, study mode, study degree, attitude to tourism studies, and work experience. The inquiry form contained closed-ended questions, a seven-point Likert scale was used, ranging from "strongly disagree" (1) to "strongly agree" (7), for gradations of opinions.

For the sake of the clarity of the statements, prior to distributing the questionnaire to potential respondents, the survey was pre-tested on a group of 35 tourism and hospitality undergraduate students. They were asked to complete the questionnaire

as well as provide feedback regarding understandability. After analysis of the pilot test data, a few minor modifications in wording and formatting were made.

Data were collected through group-administered questionnaires distributed during a regularly scheduled class period. A total of 353 participants were recruited for the study. Due to incomplete information 11 questionnaires were excluded, which resulted in 342 usable questionnaires for further analysis. The sample was demographically diverse. Participants ranged in age from 18 to 38 years old, with the mean age of 22; and 71% of them were female. The majority of them was at public university (75%), was pursuing bachelor degree (58%), and the sample was dominated by full time students (72%). 73% of those surveyed declared tourism studies to be their first choice and 47% of them had work experience in the tourism industry. Table 1 shows descriptive statistics for the sample.

Table 1. Respondent profile

Variable	Category	Share (%)	Variable	Category	Share (%)
Gender	Female	71.3	Study degree	Bachelor	58.2
	Male	28.7		Master	41.8
Age	20 and less	22.0	Study mode	Full time	72.5
	21–22	35.5		Part time	27.5
	23–24	35.5	Year of study	First	19.1
	25 and more	7.0		Second	8.2
First choice studies	Yes	73.1		Third	24.9
	No	26.9		Fourth	18.5
Work experience in tourism	Yes	47.2	Fifth	29.3	
	No	52.8	Type of school	Public	74.9
		Non-public		25.1	

The data analysis involved descriptive statistics and correlations to portray the main features of variables under study and relations between them. Because the assumption about normality in the data was violated, as confirmed by Shapiro-Wilk test ( $0.950 < W < 0.975$ ;  $p < 0.001$ ), non-parametric tests were applied to detect significant differences between groups: Mann-Whitney U test for independent samples and Wilcoxon signed-rank test for related samples. The statistical processing of the survey data was conducted using the SPSS 21.0 software package.

### 3. Results

In this section first, overall opinions on the dimensions of the company employment image in the tourism industry are reported. Then, hypotheses about relationships

between individual and organizational factors and the tourism employer image are tested. The whole analysis is based on difference scores, which measure the congruence between preferred and perceived job/organization attributes.

Basic statistics for the study variables are reported in Table 2. It presents means, standard deviations, and correlations among the constructs of interest. The picture that emerges from the table is that students generally do not believe that a career in the tourism industry will offer them values they find desirable. Respondents are particularly pessimistic about flexibility, while holding relative optimism about job content.

Table 2. Variable descriptive statistics and correlations

Variable	Mean	Standard deviation	Spearman's correlations				
			1	2	3	4	5
1. Job content	0.682	0.991	1.00				
2. Economic value	0.802	0.986	0.553*	1.00			
3. Development value	0.710	0.871	0.510*	0.634*	1.00		
4. Social value	0.807	0.954	0.578*	0.692*	0.553*	1.00	
5. Flexibility	1.128	1.409	0.321*	0.472*	0.395*	0.459*	1.00

\* Significant at the 0.01 level (2-tailed).

Since the variables under study were not normally distributed, non-parametric statistical tests were chosen to analyse data. Mann-Whitney U test was used to investigate whether the dimensions of the tourism employer image differ based on gender, study degree, attitude to tourism studies, and work experience (individual factors). Wilcoxon signed-rank test was used to investigate whether the dimensions of the tourism employer image differ based on company size, level of internationalisation, chain affiliation, ownership, and type of services offered (organizational factors). The results are reported in Tables 3 and 4.

The results of the study indicate that women held more positive belief about the extent to which tourism-related job could meet their expectations with regard to all investigated dimensions of employer image. Master degree students turned out to have more negative view than their bachelor degree colleagues on training and promotion perspectives in the tourism sector. Undergraduates and graduates who declared being satisfied with their studies trusted more that a career in tourism is likely to fulfil their requirements regarding development opportunities. Those who had been exposed to working life in tourism or whose close relatives had work experience in the industry were more pessimistic about economic benefits and prospects for professional development.

Small tourism enterprises were generally considered to offer worse financial conditions and less development opportunities but they were supposed to reward employees with better social values than large ones. Tourism companies having

Table 3. Effects of individual factors on employer image in the tourism industry

Variable	Job content		Economic value		Development value		Social value		Flexibility	
	Mean rank	U value	Mean rank	U value	Mean rank	U value	Mean rank	U value	Mean rank	U value
Gender										
Female	159.92	9297.0**	161.80	9671.5**	159.31	9314.5**	161.98	9796.5*	154.25	8600.5**
Male	196.63		193.81		192.97		190.54		190.01	
Study degree										
Bachelor	168.23	13578.0	165.53	13039.5	159.79	11976.5*	163.36	12644.5	161.01	12320.0
Master	174.88		179.81		183.06		181.58		170.74	
Satisfaction with studies										
Yes	138.68	6362.0	141.90	6986.0	136.26	5997.0*	141.02	6793.5	134.19	6100.5
No	158.94		150.76		160.49		153.60		148.15	
Work experience in tourism (own or relatives)										
Yes	172.64	11485.5	179.74	9943.0*	176.20	9913.0*	175.46	10810.0	170.61	10006.5
No	165.36		149.93		151.20		158.60		150.57	

\* Significant at the 0.05 level. \*\* Significant at the 0.01 level (2-tailed).

[320]

Table 4. Effects of organizational factors on employer image in the tourism industry

Variable	Job content		Economic value		Development value		Social value		Flexibility	
	Mean rank	Z value	Mean rank	Z value	Mean rank	Z value	Mean rank	Z value	Mean rank	Z value
Company size										
Small	27.35	-0.855	27.40	-5.351**	26.19	-2.771**	23.68	-3.233**	26.87	-0.055
Large	30.15		15.50		22.30		30.60		23.35	
Level of internationalisation										
National	21.54	-3.928**	24.74	-3.834**	27.28	-4.283**	26.46	-0.758	16.05	-0.063
International	18.36		19.05		20.75		22.37		21.93	
Chain affiliation										
Independent	15.29	-3.956**	21.57	-0.244	23.63	-0.263	11.42	-5.073**	16.68	-2.165*
Chain-affiliated	21.03		24.50		21.56		24.78		18.60	
Ownership										
Family	25.79	-3.154**	25.13	-2.148*	26.59	-3.170**	24.10	-1.700	21.05	-0.151
Non-family	22.81		18.32		21.04		27.23		20.95	
Type of services offered										
Tourism service suppliers	22.55	-2.348*	17.87	-1.491	19.94	-2.559*	21.27	-1.016	19.53	-0.224
Tour operators and travel agents	29.70		20.57		27.00		28.58		14.89	

\* Significant at the 0.05 level. \*\* Significant at the 0.01 level (2-tailed).



international divisions were believed to satisfy to a greater extent requirements concerning intrinsic value of work, reward package, and career advancement path. Chain-affiliated establishments in the tourism industry were associated with limited chances to perform interesting and challenging tasks, poorer social relations in the workplace and larger flexibility misfit between expectations and perceptions. Family firms in tourism were less likely to meet job content expectations; they were also thought to provide employees with insufficient salary and fringe benefits as well as unsatisfactory prospects for training and career-enhancing experience. Tourism service suppliers, unlike tour operators and travel agents, were regarded as better employers in terms of work itself and avenues for career progression.

Summarizing, as hypothesized, both individual and organizational variables had differential effects on employer image in the tourism industry. Each analysed factor proved to be significantly associated with at least one of five dimensions of the tourism company employment image; five of nine factors under investigation were significantly associated with three or more image dimensions. Thus both hypotheses can be confirmed. Furthermore, more dimensions of the tourism employer image differed based on organizational factors than individual ones.

#### 4. Discussion and implications

Given the acknowledgement of the significance of the customer-employee interaction in the tourism service delivery and the ability to attract and retain the best available job candidates, surprisingly little research to date have focused on determinants of variation in the tourism industry image as a place to work. The present investigation seeks to fill this knowledge gap by testing relationships between individual and organizational variables and expectation-perception discrepancies for job/organization attributes in tourism.

The findings that the tourism company employment image is affected by individual factors correspond with those obtained in previous research on organization attractiveness for prospective applicants. As noted by Gomes and Neves [2010] individual contextual factors influence the way companies are evaluated by job seekers. The data from this study show that women are more optimistic about meeting their expectations towards careers with regard to both job content and job context. The results are to some extent complementary to those of Koyuncu et al. [2008], who concluded that females were more committed to tourism careers than males. Another noteworthy result is that respondents' attitudes to studies are positively related to the employer image, which corresponds with Roney and Öztin's finding [2007] that willingness to study tourism was important factor influencing career perceptions in a positive way. The present investigation also echoes

previous observation that as students progress in their degree, they tend to have more pessimistic view on future employment opportunities in tourism [Koyuncu et al. 2008]. In line with Jiang and Tribe [2009], Koyuncu et al. [2008], Richardson [2010], and Roney and Öztin [2007], this research revealed that work experience in the tourism industry led to deteriorated perception of working conditions and more negative image of tourism companies as employers.

The research has investigated the differential impact of objective organizational characteristics that were not examined in the previous studies on employer image in tourism. The results clearly indicate that company size, level of internationalisation, chain affiliation, ownership, and type of services offered serve as signals of the job quality and influence potential employees' perceptions of career attractiveness in the tourism industry. Job content and development value are the dimensions of employer image which are the most prone to be affected by analysed organizational variables, while differences in flexibility dimension are mostly insignificant.

The results of the present study extend previous research findings, because they provide a more complete and integrated perspective of determinants of variation in the tourism company employment image. First, both individual and organizational characteristics were taken into consideration as potential factors related to the expectation-perception gaps for job/organization attributes. Organizational factors proved to play more important role than individual ones in explaining the variance of perceived tourism career attractiveness. Second, the investigation is not limited to overall company employment image, it gives the insight into employer image's dimensions.

The study may contribute to existing knowledge of job choice decisions by investigating differences in the assessment of tourism organization attractiveness as a workplace. Results of this study possess also several managerial implications.

First, understanding individual factors that are associated with the employer image is an important issue in the tourism industry. Recognition of employees' expectations allows to offer them the desired benefits and thus to attract high quality labour resources. Bearing in mind that students represent generation Y, the employers should respond to their specific expectations e.g. the need of heavy investment in training and development, variety in daily work, freedom to work on one's own initiative and desire for creativity [Solnet and Hood 2008]. The ability to create working environment that will induce employees' loyalty is a challenge for all employers of generation Y workers.

Second, the awareness of the factors that are the most important for job-seekers is crucial in retaining the key workers in the company. High staff turnover is a significant problem for tourism enterprises. When employees leave, valuable knowledge is lost and clients may follow the departing employee. Moreover, investments made on the newly adopted worker are lost, as well as knowledge and time spent on employee induction to the company are wasted. Retention of tacit knowledge embedded in human minds requires attractive employment conditions which are

in line with employee requests. Entrepreneurs who actively find ways to retain employees gain a sustainable competitive advantage.

Third, it is important for tourism companies to understand individual factors which have effect on the employer image as well as organizational characteristics which potential employees interpret as signals of working conditions in order to effectively influence job choice behaviours. Having in mind that working in the tourism industry affects adversely respondents' perception of careers in the sector, tourism companies need to modify their training programs to ensure students are receiving positive experiences while working during their degree.

Finally, employers should pay particular attention to the factors negatively perceived by potential employees and try to eliminate them. As stated by Walmsley, Thomas and Jameson [2006], unmet expectations may be inevitably associated with the entering an unfamiliar organizational setting. In order to reduce the gap between preferred and perceived job/organization attributes, students need to be informed realistically about working conditions in the tourism industry. Presenting only a positive picture of the employment experience can bring about unrealistic expectations of potential employees, which could lead to disappointment, reduced job satisfaction, and subsequently undesirable workplace attitudes, behaviours, and performance outcomes.

## 5. Limitations and future research

A number of issues must be considered when interpreting the findings of this study. Though efforts were made to negate the limitations, as with all survey research, self-reported data were analysed and they could not be independently verified. Such data are prone to common method bias, especially social desirability. Moreover, all variables under investigation were based on the same source, thus the research findings might be influenced by response consistency effect and implicit theories. Another limitation of this investigation is that it was carried out only in one city in Poland within higher education institutions. Although the students, being close to entering the labour market, are appropriate respondents for the study, due to unique characteristics of the population generalizability of the results to other prospective employees who have more working experience and are at other stages of their careers is limited. The findings may not generalize to other regions either, because of the different level of the tourism sector contribution to the local economy.

Several opportunities for future research can be identified. An enhanced understanding of differential effects of individual and organizational characteristics on employer image in the tourism industry is surely the major contribution this study makes. It would be worth to further identify and refine consequences of

the perceived tourism labour market attractiveness for job search intentions and behaviours. Research could also explore conditions in which a company employment image would be more or less influential in decisions regarding the choice of organization as a workplace. Interesting findings could be produced by a longitudinal study following undergraduates as they progress through their degrees and the training programs; it would enable to track changes in students' expectations towards work and perceptions of careers in tourism. Still to be examined is the degree to which the results could be confirmed for other target groups. Further studies are needed to verify or repudiate these findings within different contexts. Future research should seek for insights into these areas.

## Conclusions

The study's findings contribute to the knowledge of students' attitudes and perceptions of job prospects in the tourism industry. Previous career research in the tourism setting focused on general opinions on the industry attractiveness as a place to work and intentions to enter it upon graduation. This study investigates multiple factors that determine beliefs students hold about tourism-related employment. Variables characterising both prospective employees and employers were taken into consideration as potential determinants of company employment image. It appears to be the first attempt to address simultaneously differential effects of individual and organizational characteristics on employer image in tourism. Furthermore, the current research draws upon person-environment fit perspective and explores the relationships between individual and organizational factors and the compatibility between preferred and perceived job/organization attributes.

In order to be able to deal successfully with the challenges of increased international competition and many new emerging consumer preferences, the tourism industry has to put more focus on raising the level of skills, competencies, and innovation. Promoting a positive employer image can be considered as an important tool for enterprises to attract high-qualified, high-performing, service-oriented, and committed personnel who will help achieve firm's strategic goals. Understanding the antecedents of organization attractiveness as a workplace seems to be a fundamental prerequisite for creating an employer image. Only when companies work towards identifying desired job and organization attributes and then striving to develop these attributes can they hope to successfully compete in recruiting the best available candidates and retaining them.

Learning expectations and perceptions of students can help gain insights into the factors that may influence positively or negatively the assessment of the tourism industry as an employer. By investigating their employment image, companies

would benefit from getting a clear picture of the preferences of future employees and from locating any incorrect beliefs that job seekers might hold. Understanding how potential applicants evaluate the importance of various job/organization attributes and the extent to which the company can satisfy their needs with regard to job content and context, gives tourism enterprises opportunity to take measures aimed at ensuring that prospective employees are not failing to enter the industry after graduation or treating tourism jobs as short-lived professions.

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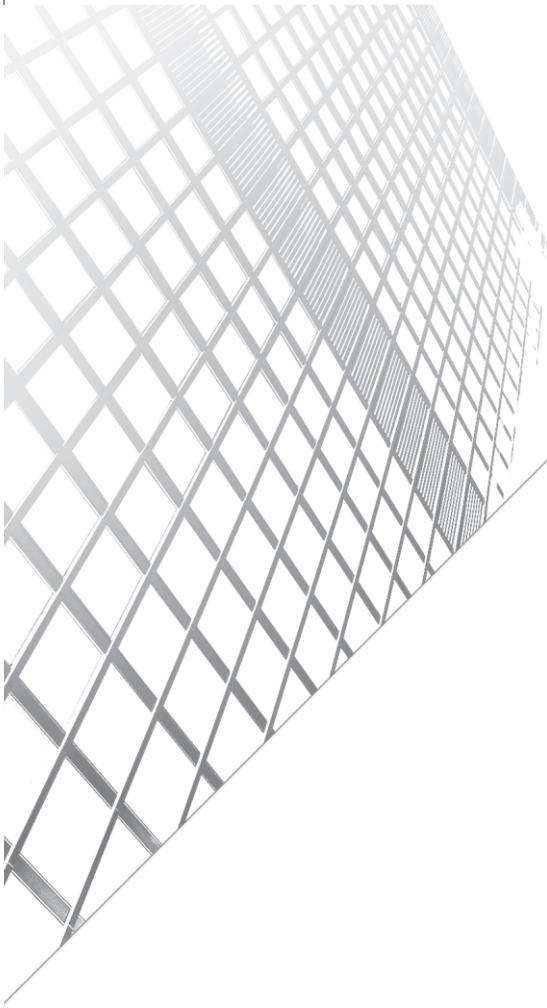
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# Using Social Media in International Business



Małgorzata Bartosik-Purgat<sup>1</sup>

## Cross-cultural gender differences in the usage of social media

### Introduction

Innovation, as well as the needs arising from socio-cultural changes cause constant evolution in relation to new technologies. In theories speaking about the behaviour of the consumer, the consumer's needs are a stimulus for action of companies for their satisfaction. However, in today's world, in the era of continuous technology development and competition between companies, they are often the first instigator of new solutions and showing consumers what needs may be met thanks to these solutions. According to J. Baudrillard, a French sociologist and philosopher (critic of globalization), freedom and sovereignty of today's consumer is a hoax. In his view, the consumer only believes to make individual and free consumer choices. In fact, as the author writes, "[...] the consumer is a sovereign being in the jungle of ugliness, which forced on them the freedom to choose [...]", the jungle, where there is a "pollution, contamination and deculturing" [Baudrillard 2006, p. 81].

Such a situation can be observed in relation to the constant changes and the development of new media, of which each shows people what needs (not necessarily those necessary) it can meet. Of particular importance in current life are social media, which often affect the change in lifestyle, behaviour patterns and value systems (e.g. a way of communication, leisure and recreation, public life, manner of education, purchasing, job search, etc.). Social media affect many areas of human functioning, their use is obviously diverse due to the different determinants, which include age [Lenhart et al. 2013], education [Hsu et al. 2015], cultural differences [Kim, Sohn and Choi 2011; Hsu et al. 2015], the degree of development of the countries (including internet access), political factors (e.g. in China access to multiple social media used by the inhabitants of the western countries is limited, Chinese community mostly uses Youku instead of YouTube, and RenRen, Wechat, Kaixin001 and 51.com replace access to Facebook and other western media for the

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Chinese) [Saw et al. 2013; Zhang and Xueb 2015]. An important factor differentiating the manner and the desirability of the use of social media is also gender. Women and men have different needs and motivations, are focused on satisfying different needs. For example, women are susceptible to a variety of details, while men look holistically at lot of things. On the other hand, men are able to do many things at the same time, have better divisibility of attention as compared to the majority of women [Trauth 2013]. Also in sociological literature, researchers identify different behaviours between men and women, in particular with regard to the method of communication and relationship management. For example, sociologists say that women are more focused on relationships, while men on tasks [Deaux and Major 1987], women are more likely than men to show preferences in relation to the maintenance of family ties [Di Leonardo 1987], ties with friends and involvement in social activities [Chan et al. 2015]. Differences between the sexes are extremely important from the point of view of media creators, as well as e.g. advertisers who put information about their products and services in the media.

The main aim of this article is to identify the types and the use of social media and its character by users with particular regard to gender as a differentiating criterion. In addition, differentiation will be shown in different countries and cultures in which the empirical study was conducted<sup>2</sup>.

## 1. Literature overview and hypotheses development

Social media is an area of interest and research of many practitioners and researchers in the influence of the media on the various aspects of life and action. The original intention of the creators of social media was to facilitate people developing social relations and communication, but soon they became a tool used by entrepreneurs, for example. to build brand loyalty, as well as other institutions, e.g. government administrations of the states, television, universities, radio stations, foundations, etc. [Cassidy et al. 2011]. Many companies and institutions have an account on Facebook pages, Twitter, among others to maintain permanent contacts with customers and stakeholders, and in order to provide the latest information on a regular basis, e.g. about events regarding individual entities or special offers.

What are the differences between particular social media? How to classify them? These questions bother not only users, but also the creators themselves. In the literature, mainly in the reports and statistics presenting the popularity and frequency of use of social media, in addition to social networking sites (we mean

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<sup>2</sup> Empirical study was conducted as part of an international project titled *New media in consumer behavior in the international market* in the years 2014–2016 (statutory research UEP no. 51102-65).

these mostly using the phrase social media) there also appear messaging applications, which, thanks to their capabilities, each day gain new users. However, the division of all media belonging to social media is very blurred, as many media have similar properties and capabilities, and are classified in different groups. In addition, new tools are changing and improving, thus modifying the classification. In Table 1, the author proposes division of the media with regard to their functionality and usability.

Table 1. Classification of social media on the international market

Social media	
Internet communicators	Social networking sites
<ul style="list-style-type: none"> <li>- QQ</li> <li>- Whatsapp</li> <li>- Facebook Messenger</li> <li>- WeChat</li> <li>- Skype</li> <li>- Viber</li> <li>- Line</li> <li>- Snapchat</li> </ul>	<ul style="list-style-type: none"> <li>- Sites transmitting content and information, music, photos or videos, (e.g. blogs, microblogs, e.g. Twitter), forums, wikis (e.g. Wikipedia), media sharing (e.g. YouTube, Instagram), social bookmarking (e.g. Reddit, Digg, Pinterest)</li> <li>- Social networking sites aimed at communication and networking friends (e.g. Facebook, LinkedIn, Research Gate)</li> <li>- Virtual social gaming worlds (e.g. World of Warcraft, Second Life)</li> </ul>

Source: [Bartosik-Purgat 2016].

In this study (as well as the empirical study), the main attention was focused on social networking sites, in particular, the study of frequency of use covered the sites transmitting information and content, music, photos, videos, etc., as well as social networking sites aimed at communication and networking friends<sup>3</sup>.

The use of social media depends primarily on the needs of the people, and the use of specific instruments meets the needs. For example, the need to share with friends memories of the trip can be addressed using a medium such as Instagram, Facebook, Snapchat or blog writing. Less useful here is YouTube or LinkedIn. One of the first and constantly popular among users are the media that connect people in a network of friends with outstanding common features, for example Facebook, LinkedIn or Myspace. Through them, users can search for people who are able to provide specific information or help in its search [Schouten 2011; Ray 2014]. Many users also use these media to enable them to comment on a specific topic in the form of the written word, oral expression or videos, for example Twitter, YouTube, Youku, Vimeo, blogs, and the use of information placed there by others [Ward 2006; Munguatocha, Muyinda and Lubega 2011; Schouten 2011; Nakagawa and Arzubiaga 2014; Kyung-Sun, Sei-Ching and Tien-J 2014; Hamid

<sup>3</sup> For this reason, in the remainder of the study the author frequently uses the term social networking sites instead of the common name social media. However, the use of the term social media in relation to the studied elements is correct, because they are part of them (hence the title uses the term social media).

et al. 2015]. On the other hand, one of the most widely used social media for the purposes of seeking information from a variety of disciplines is Wikipedia, which allows users, in addition to acquiring specific information, to add missing entries, thus contributing to the expansion of the collection, and to edit existing ones [Ryan, Magro and Sharp 2011; Ahmed 2011]. Meanwhile, in escaping their problems and reality, many people participate and move to virtual worlds, for example Second Life or to the world of virtual games, for example EverQuest [Lee and Wohn 2012].

In the literature, there are studies concerning, firstly, the use of the Internet by both men and women, and, secondly, ways to use social media separately. It should be noted, however, that the user of social media is also an Internet user. According to Kaplan and Haenlein [2010, p. 61] social media is in fact a set (group) of applications based technically and ideologically on the foundation of the Web.2.0 allowing the creation and sharing of content among the users. In turn, the Web. 2.0 is sometimes called “the second version of the Internet” resulting from technological breakthrough. However, the term Web. 2.0 is more likely to describe the way in which Internet users use the Internet resources [Walkowska 2012]. Therefore, the use of the Internet for the purposes of communication can be (and usually is) associated with the use of social networking sites. In this paper, the author focuses on the ways and purposes of use of social media rather than the Internet in general. The results of some of the latest projects in this field show that social media platforms are used by women more than men [Madden and Zickuhr 2011; Nadkarni and Hofmann 2012], women also spend more time using social media and have more friends there [Moore and McElroy 2012].

Research conducted in 2014 by the IRCenter regarding the popularity and activity of Poles in social media, show maintenance (in comparison with previous years) of the first two positions, namely Facebook and Twitter, and decreased activity of Poles in online forums. There are also differences in the frequency of use between the sexes. Women (the vast majority of users) are proponents of the blogs. Men dominate the portals and forums, as well as YouTube. On the other hand, the use of Facebook is distributed almost equally between the sexes (with a slight female predominance 52%/48%), as well as Twitter (55% women/45% men) and Google + (56%/44%). The results show that activity (publication) of women in social media increased compared to previous years (by 7.3%) [Social Media 2014].

The results of the work of many scientists show the differences between the sexes in relation to the objectives of using the Internet. It turns out that women are more likely to use the Internet to communicate (via e-mail, Internet forums and social media), build and maintain relationships and for educational purposes, while men often seek information about current events [Sherman, End and Kraan 2000; Ruleman 2012, Joiner et al. 2012; Special and Li-Barber 2012; Chan et al.

2015]. In addition, men more often than women use the Internet for entertainment, gaming and as a way to spend free time [Jones et al. 2009; Weiser 2000; Junco, Merson and Salter 2010; Muscanell and Guadagno 2012; Joiner et al. 2012; Chan et al. 2015].

Also, the analysis by Lim et al. [2014] shows that women tend to use social media primarily to communicate with friends, while men often use these media for shopping or to express their opinions. This may be due to the fact that women are less prone to the risk in the use of the Internet and its tools in comparison with men [Sanchez-Franco, Ramos and Velicia 2009]. Men more often than women post content on the web, it is a skill highly valued by them. On the other hand, women appreciate the ability to respond appropriately to the information and posts appearing on the Internet and the social media [See-To and Ho 2014]. These results may suggest that women place greater emphasis on security and trust for social media they use. In turn, men are less sensitive to the safety of these media, but cherish the opportunity to intervene and participate actively [Lim, Lim and Heinrichs 2014]. In another project Putzke et al. [2014] conducted a study where they analysed the social media, where users listen to music or make it available (e.g. YouTube). The results showed that men are much more likely to listen to music via social media than women. What's more, they are more likely than women to also share it.

Given previous research achievements of other authors, in respect of the relationship between the gender criterion and the use of social media (in particular networking sites), the following hypothesis has been formulated: *Gender significantly influences statistically the types and usage of social media.*

## 2. Methodology

The aim of the empirical research presented in the article was to identify the types and manners of use of the social media by users from different cultures, with particular regard to gender as a criterion for differentiation. Taking into account the main objective of the study, the following research question was formulated: are there gender differences in the types and manner of use of social media? The hypothetical answer to the research question is a hypothesis, which was formulated in the previous section of the article.

The study was conducted in nine culturally diverse (this was the main criterion for the selection of markets) and developmentally diverse countries. The criterion for selection of countries were also possibilities for preparation and conducting the research procedure in them.

## Measurement development

The empirical study referred to in the article was conducted using the test method which is a survey distributed in paper and electronic versions completed independently by respondents. It applied the standardized measurement tool in the form of a questionnaire, which is an original instrument prepared for the purpose of the current study. The only element differentiating the measuring instrument on the markets surveyed was the language. In order to gather more completed questionnaires Polish was used in Poland, Spanish in Spain, Chinese in China, Turkish in Turkey, Russian in Russia, and English for other markets. The original language of the questionnaire was Polish, then translated into English, Spanish, Chinese, Turkish and Russian using the method of reverse translation. It consisted in translating the questionnaire from Polish into individual languages, and then again into Polish. The original version was compared to the final version to eliminate errors due to language, lexical or contextual differences [Craig and Douglas 2006].

## Data collection

Much of the data collection in the empirical study took place in 2015 (data collection was finally completed at the turn of 2015 and 2016) in China, Spain, India, Malta, Germany, Poland, Russia, the United States and Turkey, for a total of 1,707 respondents, including 295 from China, 130 from Spain, 63 from India, 51 from Malta, 117 from Germany, 296 from Poland, 100 from Russia, 395 from Turkey, 260 from the United States. Individuals were selected using one of non-probabilistic sampling methods, namely through purposeful selection. On each market, there were designated person responsible for the distribution of questionnaires to respondents, either in paper or electronic form. The use of an online questionnaire has not produced great feedback (3.5% of all collected questionnaires). The author intentionally did not use any of the social networking sites for the distribution of questionnaires, because the measurement was carried out on diversified markets where the same medium could not always be used.

Numerical discrepancies between groups are due to difficulties in collecting data on individual markets, which in turn have largely been associated with cultural differences. The differences in size between the groups and the method of sampling result in consequences concerning the interpretation of the results obtained, which in this case should not be completely generalized to the population of the countries studied, social media users.



### 3. Results

Survey respondents in each country were people who agreed to participate, and displayed the desire to express themselves on how they use the social media. The study was attended by people of all ages, three age groups were distinguished, i.e. 15–20 years old, 21–30 years old, 31 years old or more (Table 2). In China, India, Malta, Germany, Poland and Turkey the respondents in the age group 21–30 predominated. Also in Spain this age group dominated, but here there was not such a large difference between the age groups as in other countries. In the United States, most people involved in the study belonged to the age group of 15–20. Given the numbers in age groups, it can be stated that the studied cultural groups are dominated by the so-called representatives of Generation Y. The smallest was the group of respondents over the age of 31.

Table 2. Characteristics of respondents by age and gender in relation to the country of origin (%)

		China	Spain	India	Malta	Germany	Poland	Russia	United States	Turkey
Sex	Women	68.1	50.8	22.2	37.3	50.4	70.9	67.0	56.5	48.7
	Men	31.2	49.2	77.8	62.7	49.6	27.7	33.0	43.1	49.7
	No data	0.7	0.0	0.0	0.0	0.0	1.3	0.0	0.4	1.5
Age	15–20	14.2	40.8	11.1	19.6	14.5	35.5	49.0	79.6	9.6
	21–30	66.4	50.8	79.4	49.0	82.9	63.5	48.0	16.9	76.5
	31 years and more	19.0	0.0	9.5	31.4	2.6	0.7	3.0	3.5	13.4
	No data	0.3	8.5	0.0	0.0	0.0	0.3	0.0	0.0	0.5

Given the diversity of the study group with regard to sex (Table 2) it should be emphasized that it is difficult to determine the dominance of any gender. In many countries they reached nearly parity (e.g. Spain, Germany, the United States and Turkey), the predominance of women occurred in the Chinese, Polish and Russian groups, while in India and Malta a prevalence of men was recorded.

To examine the relationship between gender and the types and ways of using social networking sites, first, an analysis was conducted of indicators of the structure of the respondents using various media daily, and, secondly, statistical indicators showing the dependence / or lack thereof between gender and highlighted specific activities were analysed. In order to identify these activities, respondents were asked to specify the frequency of performing them (*very often, often, sometimes, rarely, very rarely, never*) for individual statements (Table 4), which characterise different behaviours of social networking sites users. To determine the significance of differences between the gender of respondents in each country and the nature of

the use of social networking sites (in general, without distinguishing between the different sites) Pearson  $\chi^2$  statistics was used. In order to determine the strength of the relationship between sex and behaviour indicated, Cramer *V* ratio was used. Using the distinguished statistics arises from the characteristics of the measurement scales used in the questionnaire. The results obtained in different countries are shown in Table 4.

In the first part of the survey respondents were asked to indicate the frequency of use of individual social media. They had to choose from a long list of sites available on the market surveyed (Table 3)<sup>4</sup>. In some markets respondents indicated the daily use of many different social networking sites, for example India, Turkey, the United States, and China (figure), while other markets saw the dominance of only some services, for example Poland, Malta and Spain. The undisputed leader among the sites in the surveyed countries (except China), is Facebook. Next was YouTube, and Wikipedia (different situation takes place in China, as referred to in the following paragraphs).

Table 3. Number of persons (%) using on a daily basis (at least once a day) the highlighted social networking sites in the countries surveyed\*

	Facebook		YouTube		Wikipedia		Twitter		LinkedIn		Instagram		VKontakte	
	W	M	W	M	W	M	W	M	W	M	W	M	W	M
Spain	90.9	84.4	40.9	67.2	10.6	15.6	12.1	21.9	n/a	n/a	n/a	n/a	n/a	n/a
India	92.9	89.8	42.9	79.6	85.7	71.4	7.10	22.5	42.8	42.9	n/a	n/a	n/a	n/a
Malta	89.5	87.5	47.4	65.7	10.5	53.1	n/a	n/a	15.8	12.5	n/a	n/a	n/a	n/a
Germany	83.1	77.6	52.5	70.7	16.9	37.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Poland	92.9	82.9	65.2	81.7	20.0	26.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Russia	29.8	18.2	41.8	63.6	37.3	48.5	n/a	n/a	n/a	n/a	n/a	n/a	50.7	51.5
United States	91.8	75.9	41.5	72.3	9.52	25.9	52.4	55.3	n/a	n/a	40.8	29.5	n/a	n/a
Turkey	70.5	72.6	66.8	81.2	28.5	29.0	48.7	54.2	17.7	7.6	21.1	9.1	n/a	n/a

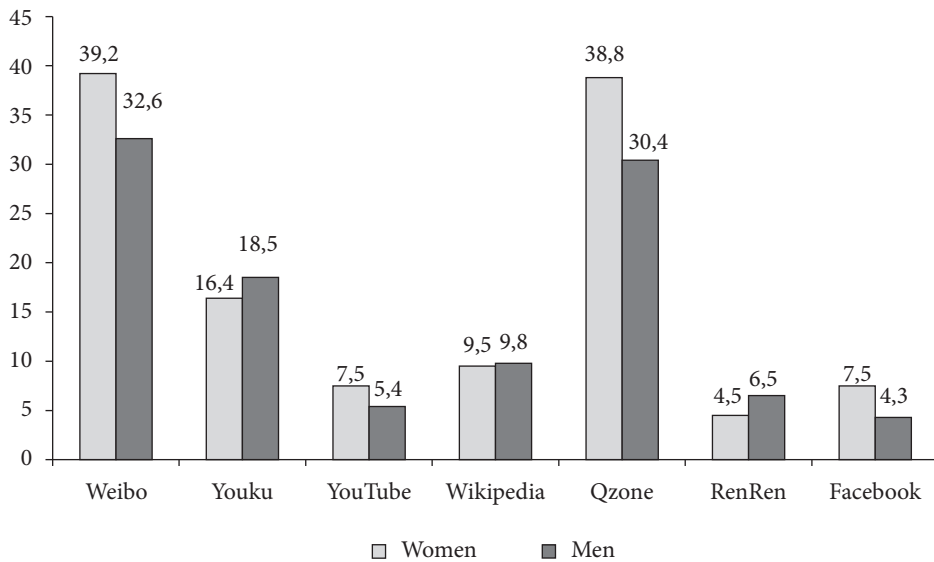
\* n/a – means no people (or very few), who use the media daily. This does not mean, however, that the studied groups do not include any users of these services.

W/M – Women/Men.

It is worth noting that in the case of the three most popular sites, i.e. Facebook, YouTube and Wikipedia, each country recorded a considerable frequency of use. A large number of respondents indicated daily (at least once a day) use of these services. On the other hand, Twitter has been listed as used daily by respondents in only four of the nine countries, i.e. in the United States, Turkey, Spain and India. In India and Spain men dominate in the study groups as the people who use

<sup>4</sup> The frequency was expressed in the following categories: a few times a day, once a day, less than five times a week, once a week, several times a month, less than once a month, several times a year and do not use this medium at all / do not know it.

Twitter. A similar situation was observed in the case of Instagram, which, in turn, in a significant number has been highlighted by the American and Turkish users. In other countries, they were few (single) indications in the study groups. Interestingly, in both countries there is a significant advantage of women – Instagram users. In turn, the social network, which is very popular in Russia, and is “equivalent” to Facebook, is VKontakte. Hence, the Russian group reported a much smaller number of respondents using other sites daily (including Facebook). Discussing the use of social networking sites in China it must be emphasized that it differs significantly from the other countries surveyed, which is caused by the limited availability of international media in the Chinese market (figure).



Number of persons (in %) using on a daily basis (at least once a day) highlighted social networking sites in China

Most people, both women and men in the studied Chinese group use a multifunctional site Qzone (“equivalent” of Facebook), which allows users to, among others, customize their blogs, keep and save diaries, send photos and listen to music. Just like in the other countries surveyed with respect to Facebook, so in China, a prevalence of women was recorded for Qzone among daily users (8.8% difference). The second site in the studied Chinese group in terms of the number of daily users, is Weibo offering almost the same functionality as Twitter. Interestingly, the Chinese group observed the advantage of women – Weibo users, while the use of Twitter is dominated by men. Third, in terms of the number of daily users among the Chinese, turned out to be Youku, the Chinese equivalent of YouTube, where a slight advantage of men was recorded.

Regardless of the surveyed country differences in the frequency of daily use of social networking sites between men and women are noticeable. Analysing the results presented in Table 3 it can be said that it largely depends on the type of media. For example, the smallest difference between the number of men and women using social networking sites every day were recorded, regardless of the country, in relation to Facebook. It should be noted, however, that in several countries, e.g. in Russia, the United States or Poland, one can see the advantage of women using this site every day (approx. 10%). Much greater differences occurred in relation to the daily use of other sites, particularly YouTube, Wikipedia and Twitter (as mentioned in the paragraph above). In all the countries surveyed dominant in terms of numbers, users of YouTube (also in China) are men. The greatest difference was observed in the Indian group (36.7%), the US (30.8%), Spain (26.3%) and Poland (16.5%). Much smaller differences in the number of users by gender were observed in the case of Wikipedia. In most countries surveyed men predominate among users of Wikipedia, although not as extensively as in the case of YouTube. Moreover, among the Indian users of Wikipedia, however, women dominate.

Identification of ways and purposes of use of social networking sites isolated the actions, which were further analysed with respect to gender. These activities, due to their nature, are divided into three areas showing their specificity [Chan et al. 2015]. The area of “communication” distinguished actions involving the use of social networking sites to keep in touch with both family and friends, as well as those with similar interests. In addition, “communication” distinguished activities related to the activity in the form of uploading (and at the same time the desire to show to others) videos, photos, interesting information, etc. Social networks are also often a source of information [Suzuki and Takemura 2014] about events, acquaintances or products. Activities related to the search for different types of information were designated as the area of “information”. In turn, a number of activities of social network users can be defined as “consumer behaviour” because they concern the activity of users at different stages of the decision making process.

From the point of view of the relevance of the results obtained using the  $\chi^2$  Pearson statistics, with regard to the gender of the respondents, and specific areas of applications of social networking sites, analysis and detailed discussion included those where the level of relevance was  $p < 0.05$ . In these cases, sex significantly affects statistically the specific manners of use of social networking sites. In the remaining  $p > 0.05$ , indicating no relationships between these variables. Statistics of  $\chi^2$  test and  $V$  Cramer factor presented in the summary table 4 illustrate that in most cases (speaking of the whole group, without distinguishing between countries) sex differentiates slightly the nature of the use of social networking sites among survey respondents. Regardless of gender users of social networking sites behave similarly in terms of the highlighted ways of using. The smallest dependence, because of the

gender factor, is observed in the field of “consumer behaviour”, and the largest in the activities referred to as “communication”.

However, analysis of the results obtained in different groups from different countries allows to establish the existence of differences between the two samples. Given the countries where the research was conducted, Poland is the one which saw the greatest diversity of ways to use social networking sites because of the category of gender. Statistics  $\chi^2$  ( $p < 0.01$ ) confirms that staying in touch with family and friends depends on the sex, but the  $V$  factor indicates that it is a moderate (0.34) and low (0.24) relationship. The vast majority of Polish women, compared with men, uses social networking sites to keep in touch with friends and family. In the communication area identified as  $C_5$  ( $p < 0.01$ ),  $C_6$  ( $p < 0.01$ ),  $C_7$  ( $p < 0.01$ ),  $C_9$  ( $p < 0.05$ ),  $C_{12}$  ( $p < 0.05$ ), the vast majority of Polish women compared to men uses social networking sites for this purpose. It should be stressed that the Polish group as the only one (with the small exception of German group), noted the relationship between gender and the activities related to the collection of information. In all the activities surveyed and classified into the “information” area, that is,  $I_1$  ( $p < 0.05$ ),  $I_2$  ( $p < 0.01$ ), and  $I_3$  ( $p < 0.01$ ) in Polish group gender is an important variable differentiating these activities, the strength of this relationship  $V$  is at the low level. The vast majority of Polish women participating in the study uses social networking sites as a source of information.

Another test group, where there was some relationship between the uses of social networking sites and gender, is the United States. Gender differentiates the nature of the action here in the area referred to as the «communication» ( $p < 0.01$ ). The vast majority of American women surveyed use social networking sites to keep in touch with family ( $C_2$ ) ( $p < 0.01$ ,  $V = 0.29$ ), post own photos and videos ( $C_7$ ) ( $p < 0.01$ ,  $V = 0.32$ ), invite friends to various events ( $C_9$ ) ( $p < 0.01$ ,  $V = 0.23$ ). In contrast, most American men using social media exchange opinions and views on various topics ( $C_4$ ) ( $p < 0.01$ ,  $V = 0.21$ ), and vote for the information posted by other users ( $C_{12}$ ) ( $p < 0.01$ ), with the strength of relationship  $V$  determined as low. This result may be related to the fact that in the United States daily users of Twitter (medium allowing posting short written posts) are men, at slight advantage.

The Chinese group reported the relationship between gender and the uses of social networking sites in four cases. Chinese women are more likely than men ( $p < 0.05$ ) to comment on the information published in social media ( $C_{11}$ ), but it should be emphasized that the advantage here is small, as evidenced by the value of  $V$ . Gender differentiates consumer behaviour in Chinese group in case of three actions in the area of consumer behaviour. Chinese women often seek advice from friends on the purchase of a product ( $CB_1$ ) ( $p < 0.05$ ,  $V = 0.2$ ) and recommend products worth it ( $CB_2$ ) ( $p < 0.05$ ,  $V = 0.19$ ). On the other hand, men in the Chinese group more often than women take part in competitions organized by companies ( $CB_5$ ) ( $p < 0.05$ ,  $V = 0.23$ ).

Table 4. The relationship between gender and the manner of use of social networking sites

		The nature of the use of social networking sites/no./ detailed behaviour						China		Spain		India	
		$\chi^2$	V	$\chi^2$	V	$\chi^2$	V	$\chi^2$	V	$\chi^2$	V		
Communi- cation (C)	1 I keep in touch with friends	7.29	0.16	2.81	0.14	1.68	0.16						
	2 I keep in touch with family	0.59	0.04	14.59	0.34	2.33	0.19						
	3 I meet new people with similar interests	14.13	0.22	6.49	0.23	<b>11.11</b> **	<b>0.4</b>						
	4 I exchange opinions and views on various topics	7.1	0.16	2.42	0.14	3.53	0.26						
	5 I browse photos and videos posted by others	12.25	0.2	2.41	0.14	3.11	0.25						
	6 I comment on posts by others	1.32	0.06	8.61	0.26	2.63	0.22						
	7 I post my own photos and videos	8.86	0.18	4.48	0.19	4.64	0.3						
	8 I recommend interesting websites to other users	5.38	0.14	4.96	0.19	3.4	0.26						
	9 Invite friends for various events / events	10.23	0.2	13.89	0.33	2.08	0.19						
	10 I post the information that I became interested in	4.64	0.13	<b>11.36</b> **	<b>0.3</b>	0.58	0.1						
	11 I comment on the information posted by other users	<b>10.36</b> **	<b>0.19</b>	3.09	0.15	0.56	0.1						
	12 I vote for the information posted by other users	12.86	0.2	4.11	0.18	4.04	0.28						
Informa- tion (I)	1 I seek information and learning materials	4.5	0.13	12.79	0.32	1.05	0.13						
	2 I seek current information on various events	4.81	0.13	3.05	0.15	4.47	0.28						
	3 I seek information on various products	4.8	0.1	5.48	0.21	3.94	0.27						
Consumer behaviour (CB)	1 I seek advice from friends on the purchase of a product	<b>12.05</b> **	<b>0.2</b>	<b>12.07</b> **	<b>0.31</b>	3.89	0.27						
	2 I recommend to other users various products which are worth it in my opinion	<b>10.3</b> **	<b>0.19</b>	6.91	0.23	0.72	0.12						
	3 I post when the product I purchased proves to be „shoddy” (warn others) – as a warning	18.65	0.3	6.08	0.22	2.76	0.23						
	4 I watch the ads posted there (promotional videos, photo of collections, etc.)	4.2	0.12	6.88	0.23	5.35	0.31						
	5 I take part in competitions organized by companies of which I am a fan	<b>12.86</b> **	<b>0.23</b>	12.03	0.31	0.95	0.13						

	Malta		Germany		Poland		Russia		United States		Turkey		
	$\chi^2$	V	$\chi^2$	V	$\chi^2$	V	$\chi^2$	V	$\chi^2$	V	$\chi^2$	V	
Communication (C)	1	4.85	0.31	0.24	<b>33.08*</b>	<b>0.34</b>	2.72	0.16	5.31	0.14	<b>9.69**</b>	<b>0.16</b>	
	2	4.09	0.28	3.9	<b>15.90*</b>	<b>0.24</b>	2.53	0.25	<b>21.69*</b>	<b>0.29</b>	4.68	0.11	
	3	6.22	0.35	1.02	0.09	1.65	0.08	4.3	0.21	14.9	0.24	<b>30.3*</b>	<b>0.3</b>
	4	1.77	0.19	2.8	0.15	2.69	0.1	<b>8.4**</b>	<b>0.3</b>	<b>11.69*</b>	<b>0.21</b>	5.8	0.13
	5	7.27	0.38	1.66	0.12	<b>21.67*</b>	<b>0.28</b>	4.73	0.21	0.99	0.06	14.35	0.19
Information (I)	6	7.21	0.38	5.14	0.21	<b>16.92*</b>	<b>0.24</b>	8.36	0.3	6.89	0.16	4.15	0.1
	7	3.49	0.26	10.09	0.3	<b>19.48*</b>	<b>0.27</b>	3.98	0.2	<b>26.11*</b>	<b>0.32</b>	8.77	0.15
	8	6.89	0.37	6.64	0.25	2.57	0.09	2.8	0.17	1.18	0.07	3.1	0.09
	9	<b>8.3**</b>	<b>0.39</b>	5.27	0.21	<b>13.95**</b>	<b>0.22</b>	3.99	0.2	<b>13.54*</b>	<b>0.23</b>	3.17	0.09
	10	3.24	0.25	3.13	0.16	<b>15.41**</b>	<b>0.23</b>	5.92	0.24	5.27	0.14	2.4	0.08
Consumption behaviour (CB)	11	2.34	0.21	2.9	0.16	9.20	0.18	3.66	0.19	5.85	0.15	5.03	0.12
	12	4.67	0.3	1.7	0.12	<b>11.65**</b>	<b>0.2</b>	2.25	0.15	<b>15.89*</b>	<b>0.25</b>	10.62	0.17
	1	10.6	0.46	5.74	0.22	<b>7.62**</b>	<b>0.17</b>	7.3	0.27	4.3	0.13	16.65	0.2
	2	1.74	0.18	<b>9.82**</b>	<b>0.3</b>	<b>15.98*</b>	<b>0.24</b>	9.12	0.3	7.13	0.16	8.99	0.15
	3	5.93	0.34	3.46	0.17	<b>16.98*</b>	<b>0.25</b>	2.4	0.15	6.33	0.16	6.52	0.13
Consumption behaviour (CB)	1	10.61	0.46	3.22	0.17	0.73	0.05	7.54	0.27	5.88	0.15	4.4	0.1
	2	<b>9.5**</b>	<b>0.47</b>	13.9	<b>0.34</b>	6.07	0.14	4.4	0.2	12.41	0.23	7.9	0.14
	3	12.06	0.5	7.57	0.26	4.04	0.12	1.88	0.14	12.73	0.22	6.46	0.13
	4	4.15	0.3	<b>13.38**</b>	<b>0.34</b>	3.97	0.12	4.04	0.2	2.08	0.09	3.8	0.1
	5	6.48	0.36	2.8	0.16	6.42	0.15	2.5	0.16	14.16	0.23	18.87	0.23

\* Correlation is significant at  $p < 0.01$ . \*\* Correlation is significant at  $p < 0.05$ .

In other samples, gender differentiates highlighted behaviour in two and less situations. The Spanish group recorded only two activities in which sex was a differentiating variable. Both in the case of posting interesting information ( $C_{10}$ ) ( $p < 0.05$ ,  $V = 0.3$ ), and seeking advice from friends on purchases ( $CB_1$ ) ( $p < 0.05$ ,  $V = 0.31$ ) men from Spanish group do it more often than women (the strength of these dependencies at moderate level). The differences between the use of social networking sites between the sexes in the German group were observed only in two cases. In the “information” area, the surveyed women more often use social networking sites as a source of information about current events ( $I_2$ ) ( $p < 0.05$ ,  $V = 0.3$ ). In addition, German women more often watch advertisements posted on these sites ( $CB_4$ ) than men ( $p < 0.05$ ,  $V = 0.34$ ), and the strength of this relationship is at a moderate level. Interestingly, in the German group, gender does not differentiate ways to use social networking sites specified as communication. In contrast, in the Turkish group gender significantly affects only two activities classified to the area. Slightly more surveyed Turkish women, compared to men, keep in touch with friends using social networking sites ( $C_1$ ) ( $p < 0.05$ ,  $V = 0.16$ ), but the strength of this relationship is not large. In turn, the Turkish men much more often (and more) use social networking sites to meet new people ( $C_3$ ) ( $p < 0.01$ ), moreover the strength of association is specified as moderate ( $V = 0.3$ ). The Maltese group reported differentiation based on gender, only in the case of two activities (it is worth to note the strength of these relationships  $V$ ). By far the greater number of men from Malta invite friends via social networking sites to a variety of events ( $C_9$ ) ( $p < 0.05$ ,  $V = 0.39$ ). In addition, gender differentiates behaviour in the Maltese group in the form of recommending products to other users ( $CB_2$ ). Men more often ( $p < 0.05$ ,  $V = 0.47$ ) social networking sites utilize in this way compared to women. In Indian and Russian groups only one activity associated with the use of social networking sites is differentiated by gender (in both groups in the sphere of communication). In India a little more men meet new people with similar interests through the media ( $C_3$ ) ( $p < 0.05$ ,  $V = 0.4$ ). In turn, in Russia gender differentiates the surveyed group for activity associated with the exchange of opinions and views ( $C_4$ ) ( $p < 0.05$ ,  $V = 0.3$ ), where a little more and more often men use social networking sites in this way.

## Conclusions and implications

Summary and conclusions from the results of the research presented in the earlier part of the article can be divided into two areas, namely those concerning the types of social networking sites used by the participants in the study with regard to gender and the relationship between the nature of the use and impact of gender.



Generally speaking, it should be noted that the differences between gender and daily use of the various social media were observed. The site most commonly used in the studied groups (excluding China and Russia) is Facebook, which recorded slight differences between the sexes. Note, however, that the results show a slight advantage in the number of women using Facebook. These results are similar to those presented in the previous parts of the article [Social Media 2014]. Similarly, in China more women use Qzone daily, which is, in its specificity “equivalent” to Facebook.

Few countries in the study groups reported the daily use of the new medium, which is Instagram. The greatest number of respondents – using Instagram – was observed in the United States and Turkey. Characterizing the users of this site, it should be emphasized that in the countries surveyed, those were mostly women. On the other hand, men constituted an advantage in the frequency of use of Twitter, a medium for posting and reading brief written information. This affected the result showing the effect of gender on the nature of the activities on sites. For example, in Spain and the United States, where the majority of Twitter users were men, there was a relationship between the activities of exchanging opinions ( $C_4$ ) and posting interesting information ( $C_{10}$ ) and sex (and the performers of these activities were mostly men). Comparing Twitter and Instagram – with regard to gender of their users – we can say that women prefer a pictorial way of communication (Instagram), and men – a written one (Twitter). Men also dominate, on the basis of the results, as everyday users of YouTube and Youku (China). However, there was no effect of gender (the Pearson  $\chi^2$  test and  $V$  test) on ways to use the media, by, for example, uploading own videos, watching other people’s videos. Men also dominated as everyday users of Wikipedia.

Referring to the relationship between specific actions in social media and gender, depicted by  $\chi^2$  statistics and Cramer  $V$ , it should be noted that not in all countries, gender significantly differentiates them. The biggest impact of gender on the specific behaviour was observed in Poland. Polish women more often use social networking sites for communication and use them as a source of searching for different types of information. In turn, the smallest dependence was identified in Russian, Indian and Maltese groups. Certainly a big impact here was the number of these groups compared with the others. The author is aware of this and therefore the results obtained from each group are not generalized to the entire population in each country (this is subject to the number and the method of selection of respondents). The dependence results of the Pearson  $\chi^2$  test allow to draw the following conclusions:

- women, through social networking sites more often:
  - maintain contact with family and friends (e.g. United States, Turkey, Poland),
  - seek advice from friends on the purchase of a product (e.g. China),
  - recommend various products to other users (e.g. China),
  - view videos and photos posted by others (e.g. Poland),

- watch advertising for products (e.g. Germany),
- seek information about events (e.g. Germany, Poland),
- comment on posts by others (e.g. China, Poland);
- men, through social networking sites more often:
  - exchange opinions and views (e.g. United States, Russia),
  - meet new people with similar interests (e.g. Turkey, India),
  - vote on the information published by other users (e.g. United States),
  - advise a friend on purchases (e.g. Spain),
  - take part in competitions (e.g. China),
  - post interesting information (e.g. Spain),
  - invite to events (Malta).

In summary of the two types of analyses presented above, it should be stated that gender is a factor differentiating the uses of social networking sites, but the strength of these relationships is moderate or poor. It can be concluded that the hypothesis formulated on the basis of the research question is true. It should also be noted that the results of this study, with no distinction between countries, confirm the results of earlier projects (presented in the theoretical part of the article) showing the relationship between the nature of the use of social media and gender [Sanchez-Franco, Ramos and Velicia 2009; Jeen-Su et al. 2014; See-To and Ho 2014; Putzke et al. 2014, Kemp 2015]. It should also be emphasized that the nature of the differences in the results obtained in different countries is conditioned by cultural differences.

Answers to the research question in the form of study results and verification of the hypothesis can assist practitioners in their decisions when launching and shaping the social media platforms. Understanding the motivations and needs of network users, including social media, is particularly important for the development of online communities, as well as for advertisers to place relevant ads on relevant pages [Okazaki and Taylor 2013]. The results, showing the differences between the sexes in the usage of the social networking sites are particularly relevant and interesting for future creators of new instruments and applications for a particular segment of customers (e.g. differing in terms of gender). In addition, the results can certainly be useful for companies publishing information about their offers in the media, as there are differences between the sexes in relation to perception and attention to product attributes and advertising messages.

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## Social media as a tool to support building relationships in the international market

### Introduction

Although social media have been developing for 10 years, their importance for the social sciences and economics has not been sufficiently explored. Through social media, customers received a tool useful in the spread of opinions about the offer of enterprises, thus affecting the choices of other consumers. At the same time, they open new opportunities for those enterprises, which can apply them to an active dialogue and developing relationships with customers. This is a completely new situation for most B2C markets, so far characterized by immanent anonymity [Wieczerzycki 2014]. As a result, relational orientation has become not only the new marketing paradigm, but also an important part of one of the most widely accepted modern theories of enterprise – Resourced Based View (RBV) [Deszczyński 2014].

The primary objective of relationship oriented business is not the sale itself, but developing a solid customer base and investing time and resources in the most profitable relationships. To achieve this, efforts should be made to better understand own customers and proactively influence their commitment to the relationship with the company/brand [Deszczyński 2007]. Assessment of the relation with the company from the perspective of the consumer is mainly due to the added value obtained as a result of long-term cooperation, in comparison with the value that could be obtained from the consumption of an ordinary offer [Gwinner, Gremler and Bitner 1998]. Market research indicated the presence of several major customer benefits resulting from the described relationship. The uppermost include the economic benefits and the benefits of tailoring the offer. No less important proved to be the psychological benefits associated with a gradual reduction of resistance and increase in confidence, and social benefits of belonging and commitment [Łuczak and Soniewicki 2012].

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Adopting the appropriate position in the minds of customers may be difficult given the fact that every day they are bombarded with hundreds of advertising messages [Storbacka and Lehtinen 2001, pp. 89–91; Kotler 2012, p. 118; Hill Holiday 2015]. Many industries also struggle with low emotional potential of the products, which greatly limits the scope of activities in the field of customer relationship management (CRM) [Deszczyński 2008]. Therefore, companies are looking for ways to increase commitment of their customers by offering innovative solutions, such as those in the field of co-creation of value or gamification [Dymitrowski 2012]. The basis for conducting effective dialogue, however, is a willingness to monitor and support the core activities carried out within the framework of social media, namely: conversation, sharing, publishing, and participation [Buchnowska 2013].

The intention of the authors of this article is to examine the degree of utilization of social media by businesses occupying leading positions worldwide in selected consumer products industries: pet food, brewing, and automotive. Most of enterprises operating in those industries in the classical marketing-mix sense mostly relied on one-way mass communication and distribution of products through intermediaries, practically cutting them from the opportunities for dialogue with the end customers. As assumed, the possibility of two-way communication, and even the development of strategies of customer relationship management in the framework of the instruments of social media (Social Customer Relationship Management – SCRM) should significantly facilitate interactions with the consumers and may become a source of valuable information about them. On thus outlined research perspective, we imposed one more relating to decision-making dilemmas of international companies facing the choice of standardization or adaptation of activity carried out in this field. The key issue here is the question of the scope of standardization of SCRM activities in relation to the degree of homogeneity of the needs of consumers and synergies possible to achieve through this both in terms of the cost optimization, and in terms of the impact of marketing communication.

## 1. Methodology

To achieve this objective, methodology of retrospective comparative study was applied to the posts published on Facebook on three different markets by the companies representative on the global scale. The Facebook website was chosen because of its largest scale as measured by number of registered users (1.4 billion), which is an undeniable advantage especially in B2C industries [Ingram 2015]. To exclude the impact of seasonal factors, the study sample consisted of all information posted by analysed publishers in the period December 2013 – December 2015. Analyses were carried out manually categorizing posts, primarily on the basis of

their content and graphical material used. Results thus obtained were subjected to comparative analysis, which allowed the separation of activities aimed at building relationships and the differences and similarities occurring in the studied markets.

## 2. Pet food industry

It would seem that the pet food industry is a peripheral to the traditional food production sector for human consumption. This market, however, has been quoting continued sales growth for many years. In 2004, its value amounted to 38.9 billion USD, in 2008 to 53 billion USD, in 2011 to 65.8 billion, and forecasts for the year 2017 talk about reaching a ceiling of 95.7 billion USD [Taylor 2010; 2012].

Underlying this constant trend are the demographic and social changes, as well as constantly progressing urbanization. More and more single people of all ages and families in which statistically less and less children are brought up, decide to adopt a pet friend. In 1988, when relevant studies were first conducted, 56% of US households had a pet declared. Today it is already 65% [APPA 2015]. In the United States, there are as many as 85.8 million domestic cats and 77.8 million dogs [Greenbiz 2015]. In Poland, their number is estimated at approx. 6.1 million domestic cats and 7.8 million dogs [Rynek Zoologiczny 2012]. Love for animals is revealed not only in Europe and America, but also begins to include countries such as China, Mexico, Thailand, where market growth is in double digits [Euromonitor 2015].

The phenomenon of sustainable development of the industry is based not only on increasing the number of animals, but also a change in the perception of their importance to the owners. 79% of surveyed Americans with animals declared in a recent survey that the quality of food fed to their pets is just as important for them as what they eat themselves [Washington Post 2015]. People approach buying a pet “like the family planning” [Bloomberg 2015]. There is also research aimed to prove how pets have positive impact on humans [Petfood Industry 2015a]. In turn, the Fortune magazine, in addition to the ranking of the largest companies of the world also has the ranking of employers most friendly to pet companions at work. At the top are the companies such as Google, Salesforce and Mars, as well as a hotel chain, in which the official employment was given to dogs – holders of the function of directors for animal relationships, helping reception employees to greet guests [Fortune 2015].

The constantly increasing attractiveness of the market for pet food is the reason for increase in the competitive battle for the favour of dogs, cats and their owners. Improvement of quality standards, product diversification and new ways to reach customers require investments that affect the consolidation in the industry. Thus, the list of the three largest producers of 2014 included such well-known companies

as Mars (with a turnover of more than \$17 billion and major brand Pedigree), Nestle (almost US \$12 billion, major brand Purina) and Procter & Gamble (over US \$3 billion, major brand Eukanuba) [Petfood Industry 2015b]. Mars Petcare in 2014 further strengthened its position by taking over a branch of Procter & Gamble Pet Care in most markets, but leaving the existing independence of the competitor brands [Gasparro 2014]. Given the fact that all the brands are represented on a global scale, they can be subjected to further analysis, to which following markets were selected: Canada/US, Germany and Poland.

One of the trends in the market for animal feed is striving to develop direct relations between companies / brands and the owners of the pets. The traditional way of purchasing these products in small stores and at veterinarians gives way to online channels, which e.g. in Poland account for almost half of the purchases [Rzeczpospolita 2015]. This makes it possible to bypass the primary barriers to customer relationship management, which is the opportunity to establish direct contact with the customers [Deszczyński 2005]. However, to step out of the realm focused primarily on transactions towards partnership and to building relationships with the brand, it is necessary, as already mentioned, to apply SCRM and PR activities based on social media [Deszczyński 2012]. This is facilitated by the fact that pet owners more often use digital devices and technologies than people who do not have pets. E.g. in the United States 74% of them used the smartphone in the last 30 days, compared to 64% of the remaining population. The challenge remains, however, that among the most common reasons for online contacts with the brand is the search for products, comparison of prices and promotions (from 44% to 46%), while a visit to the social networking sites is indicated by every third person only (34%) [Sprinkle 2015]. In this context, particular importance is given to proper preparation of marketing content in order to obtain a high degree of involvement of community members being built. It seems that perhaps not the product itself, but the ultimate recipient for whom it is designed provide the chance to overcome the barriers of indifference and emotionalisation of communication directed to clients, increasing the perceived value of their relationship with the brand [Deszczyński 2011]. Because of the homogeneity of the nutritional needs of animals, it can also be initially assumed that both product policy and strategy for customer relationship management, which in particular consists of the products and complementary services (*cross-selling*), communication standards of customer acquisition (*lead management*) and loyal customers, particularly in terms of creating brand (*loyalty management*) [Deszczyński and Fonfara 2014] should be standardized throughout the world. As it turns out, this assumption does not fully work.

In the case of the brand Pedigree there are some similarities between the Polish and the German side. They use the common database of photos of dogs, mainly promoting the same product (*Dentastix*) referring to the same marketing



efforts – action *Month of healthy teeth* and using promotional messages with the same intensity (16%–18% posts<sup>2</sup>). Also, at similar intervals they offer an opportunity to participate in a chat with a veterinarian providing advice in real-time. But that is where the similarities end. While the Polish site was built mainly around advice (23%) and facts from the life of dogs (13%), the German version is focused on action to support shelters for dogs (29%) and referring to holidays falling within a specified time (e.g. Christmas) or other occasions (e.g. dog days) (18%). Another very important category is action *Hundebewegen* promoting exercise with dogs (22%) and brand Pedigree. Its finale took place on Joey Kelly's farm (former frontman of the band once popular in Germany, The Kelly Family), and it was preceded by the stages of performing specific exercises, documenting them and uploading to the site, which also had an impact on the amount of aid, which the producer donated to an organization for the protection of animals.

A completely different philosophy was adopted by the Canadian branch of Pedigree. At this site, almost half of posts are short incentives for sharing photographs of fans' dogs taken on various occasions. Other actions include occasional posts referring to often very loosely related to the canine themes (e.g. national holiday), tips (based on other sources than the European) (10%), posts promoting products (other than *Dentastix*) and supporting shelters (9%). Photos used in Canada, and even Pedigree logo varied in relation to the European markets.

In the case of the brand Eukanuba there is repeated use by the European representatives of the same database of photos, tips and facts from the life of dogs. Another common element are simple contests – guesswork involving publishing of partly obscured dogs, whose breed is to be guessed by fans. It seems that German and Polish companies can also use other common materials on a voluntary basis, as evidenced by e.g. the same reports from the brand sponsored World Challenge tournaments in Amsterdam. This does not preclude undertaking other activities, as in the case of the Polish version with invitations to public lectures devoted to dogs conducted by the staff of Warsaw Agricultural University, in the case of Germany – a parallel dialogue with the owners of cats.

All sites – also American-Canadian, displayed materials referring to studies showing that the use of Eukanuba products extends the life of dogs. However, while on the US-Canadian sites this subject comprised up to 12% of posts, in Europe it mainly boiled down to posting a video promoting the results of research (3%). Point of interest is the fact that the European version is almost identical to that across the ocean with the exception of the background music, which while maintaining the same melodic line, is of much more serious nature. There may be some similarity in the fact that the brand Eukanuba has not actually engaged in supporting animal shelters (only 4% in the case of the Polish site).

<sup>2</sup> In the remainder of the text percentages relating to the number of posts are given in parentheses.

Other topics appearing on the European and US-Canadian pages significantly differ from one another. In Europe, a significant number of posts appealed directly to the promotional content (approx. 33%), and attempts to increase fan engagement through requests to share photos of animals taken in different situations and circumstances (more than half of the posts). In the US and Canada in relation to the subject of longevity the so-called *Eukanuba stories* appeared in large numbers – the reports of owners satisfied with the long-term effects of feeding selected food lines to pets (over 20%). Hence, many photos placed on this website come from private individuals and are not branded. Eukanuba stories have also been used to provide diversity of food “We have food for every breed,” which, although it seems a strong competitive advantage was not even raised in Europe. Moreover, the posts were dominated by reports from brand-sponsored events (mainly Eukanuba championship – 12%) and a campaign calculated for many months *Canine companions for independence* (11%). This action emphasises the role that dogs play in assistance to the disabled people. In fact, it focuses, however, on the induction of positive emotions associated with watching growth of dogs from birth, which were to be trained for this purpose.

In the case of Purina low level of standardization (starting with the three versions of the brand Purina – Canada / USA, Purina One – Germany, Friskies by Purina – Poland) was accompanied by a generally unsatisfactory level of dialogue conducted with customers. In fact, only the Polish site displayed the professional approach to communication, as exemplified by the number of posts (average 180 per year vs. approx. 120 per year in other countries) and fans (93,000 vs. 6–7 thousand), as well as the advancement of operations (mainly the campaign in Carrefour supermarkets with elements of play in the form of documentation pictures taken with the brand mascot and competition with prizes). In the Polish version the important position was also occupied by occasional posts referring to holidays, anniversaries and other occasions (18%).

Unlike Pedigree and Eukanuba, Purina’s German site does not use common databases of photographs and other materials. The most popular topics on this site related to animal shelters (15%), the photo contest *Cat of the month* (11%) and short trivia about the life of dogs and cats (11%). Additionally, the action based on the first three weeks of the life of a cat in a new home is worth noting, as it combines useful tips with promotional elements. Its essential part did not take place, however, on a platform of social media, but on a site requiring registration.

US-Canadian version of the Purina site was relatively active only in 2014. Over the past 12 months the posts have been very rare, although it should be noted that up to 8% of them contained footage. The dominant topics of the service included advice (19%), occasional posts (16%) and promotions (13%).

In summing up the collected test results, it can be concluded that, despite the homogeneity of the nutritional needs of dogs and cats, companies producing pet food

do not apply global communications strategy and relationships management with clients buying for their pets. In the case of Pedigree and Eukanuba, there was some kind of regional standardization, which certainly brought savings in the preparation of content, and increased professionalism of the marketing message. Nevertheless, these actions has not always led to the achievement of satisfactory results (e.g. less than 3,500 fans of Eukanuba in Poland within two years, responsiveness to the posts among the German fans of Eukanuba at 0.02%). In the case of the third studied brand – Purina, standardization does not occur either on the global or regional basis, which does not have a clear impact on the performance indicators (e.g. the number of fans in the Polish market over 90,000, responsiveness to the posts among the German fans at the level of 0.35 %). These results should not be interpreted as an indication of the need for adaptation of measures in the field of SCRM. The examples are not characterised by strategy conceived by management of the described companies, but rather are the result of locally available resources and sometimes spontaneously emerging ideas from small teams assigned to handle the social media channel. In this context, an outstanding example is the *Hundebewegen* campaign by Pedigree brand. For many months, it has drawn attention of a wide range of customers who repeatedly performed tasks developed for them, which in turn gave responsiveness at 0.14% / post with the amount of fans exceeding 71,000. The answer to the question how many of these people will remain committed to the brand and engaged in the dialogue is beyond the scope of this publication. Undoubtedly, the issue of dialogue with customers online needs to be improved, as evidenced by not only the results presented in this section, but also other studies, e.g. on efficiency of the lead management process, which also confirm how much potential there is still to use here [Deszczyński 2013; Deszczyński and Mielcarek 2014; 2015; Deszczyński 2016a].

### 3. Brewing industry

Brewing industry has its own specific character – individual companies have similar production technology and offer a largely homogeneous product for which the main element distinguishing it from the others is the brand [Gammelgaard and Dörrenbächer 2013]. This situation makes the possibilities offered by social media in terms of branding appear to be even more valuable than in other industries. Communication conducted with consumers through them, as well as relationships built within them can thus be a key competitive advantage. The potential of social media stems from the fact that the brewing industry is dominated by large multinational corporations operating in multiple markets. The use of global sites such as Facebook allows to conduct marketing activities in all these markets through one medium – regardless of whether the company pursues a strategy of adaptation or standardization.

The three major manufacturers of the brewing industry are Anheuser-Busch In-Bev NV, SABMiller PLC and Heineken International [Global NEWS 2015]. All three companies have a global reach, operating on the markets of dozens of countries [Heineken Annual Report 2014; AB-InBev 2014; SABMiller Annual Report 2015]. From the portfolio of brands, the following were selected, respectively: Corona (in the basic extra version – light lager coming from Mexico), Grolsch (comprising primarily light lagers of varying alcohol content) and Strongbow (cider, originally manufactured in the UK).

In the case of the first of the analysed brands, namely Corona, the US market has a separate, independent site, while the Polish and British markets have their own language versions of the global website. The American site has collected so far 1.6 million likes, while the global one – 9.2 million likes<sup>3</sup>.

On all three sites, there are common posts aimed at brand building, composed of graphics or video bearing short, often one sentence commentary, which combine the product with a variety of positive events and experiences. Often used is the theme of the beach and related activities – such posts are usually accompanied by the hashtag #FindYourBeach. All the sites also publish entries on the occasion of the most popular holidays like Christmas or New Year. British and Polish version of the site often refer also to the brand-related festival Corona Sunsets. There are also references to other events, such as the International Beer Festival and the Poznań Beer Trade Fair. The site dedicated to the American market devotes many entries to boxing and typically American festivities, like Halloween or Thanksgiving. On the other hand, there are practically no posts meant to engage with the consumer community, which are quite common in both British and Polish versions. They usually take the form of contests in which participants speak on a given topic.

On all three sites, communication with consumers via the comments is quite common. Usually it takes the form of a simple exchange of pleasantries. In the case of the British and Polish sites, it often refers to the competitions and festival Corona Sunsets.

Also the second analysed brand – Grolsch – has a global fanpage on Facebook, with various language versions dedicated to specific markets – including the British and Polish. The American market does not have its own version of the page. In this case, at the level of the interface we deal with standardization – US consumers use the general version of the website dedicated to all markets that do not have a dedicated page. The total number of likes is smaller than for both Corona fanpages – amounts to approx. 427,000<sup>4</sup>.

Nature of the posts published on various versions of the site is largely standardized. Each of them displays posts engaging consumer community – in the form of

<sup>3</sup> Data as at 28.12.2015.

<sup>4</sup> Data as at 28.12.2015.

questions or contests. In all three cases, very few entries directly inform about the product and its variants. All three pages display the brand-building posts (in the form of graphics or a video bearing typically a one sentence comment, as was the case with the sites promoting the brand Corona), and referring to the brand-related values – above all, creativity. It should be noted, however, that the specific content appearing on these pages in most cases does not overlap between the pages.

Another common feature of all versions of the page is a tendency to go beyond the main subject and reaching for issues related to the broader culture and art displayed on their pages. Especially in 2015, in which the brand celebrated its 400<sup>th</sup> anniversary, it published more posts about culture than those strictly referring to the topic of beer. At the same time the content differed between the different versions of the page – on the one dedicated to Polish market the predominant motive were anniversaries connected with great artists and their famous works, described in extensive posts, with a significant number of hashtags (which in the other versions were present in small amounts). The general version of the website dedicated to, among others, the American market, published numerous interviews with contemporary artists and people of culture, often related to the aforementioned creativity. All three versions of the page displayed references to cultural events, often taking place on the local market (e.g. Stanley Kubrick exhibition in Kraków, American Film Festival and the British Academy Television Awards). Even in the case of events of global reach, their selection did not overlap between the pages.

Communication with consumers in the comment section is subject to adaptation for the Polish market. While on general version and the British fanpage responses to consumer questions are quite rare, succinct or even perfunctory, on the Polish site, the two-way communication is not only widespread, but also more extensive. It also has a fairly informal and spontaneous character.

In case of the third analysed brand – Strongbow cider – all considered markets have dedicated language versions of Facebook pages (Polish has been run since March 2015). All local pages are integrated into a single, global fanpage with a total of approx. 1.1 million likes<sup>5</sup>.

British version includes mainly posts focused on brand building and followed the formula of graphics text, creating positive associations with the brand. There are also posts meant to engage consumers in a dialogue with the brand. To this end, the page administrators publish humorous content, encourage the sharing of photographs containing Strongbow products and organize simple contests (e.g. involving friends tagging). Many posts also refer to specific events, relevant from the point of view of British consumer – e.g. independence day, cricket or football matches, as well as various local festivals (e.g. Isle of Wight Festival, Parklife Festival).

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<sup>5</sup> Data as at 28.12.2015.

Polish language version greatly resembles the British one. Published posts usually consist of graphics or video and a single sentence, together building positive brand associations, fewer are direct attempts to encourage consumers to interact with the brand (e.g. in sharing photos containing Strongbow cider, as on the British page). Just as on the British version of the site there are also references to events of local importance, such as Open'er Festival, or the Festival of Apples and Cider. It can therefore be concluded that regarding the published posts, the Polish version is standardized in terms of form and adapted in terms of content.

The page for US consumers is even less formal than the British one. The language used is less official, richer in colloquialisms, and the distance between the two sides of communication is shorter. More frequent than on other pages are call-to-action posts, encouraging fans to share their experiences and feelings associated with the brand. Adaptation is also posts promoting specific products that usually do not appear in other language versions. A TV commercial posted on the page turned out to be the content most popular among fans. It should also be noted that the published posts are more extensive than in other versions, often consisting of many sentences (while the Polish and British versions very often are limited to one sentence). On the other hand, they are published less often, usually several times a month, while for British and Polish versions, it happens that the new posts appear even several times a day.

Communication conducted via the comment system is similar on each page – it is highly perfunctory, limited to the courtesy thanks for favourable reviews from consumers and helping consumers locate the nearest product dealer or requests for contact with quality control in response to criticism. In this case, we deal with standardization.

In conclusion, for the brands representing the brewing industry, one can speak both standardization and adaptation in terms of communication carried out through Facebook pages.

The subject of standardization is primarily the form of brand building entries, consisting of graphics or video, usually with a short comment and the values that the brand would represent.

Adaptation in the analysed markets often takes place at the interface level, because each of them (except the US site of Grolsch brand) has a separate version of the page. The subject of at least partial adaptation are the posts that refer to specific events (which often are local) and approach to engaging consumer communities (in this case activities undertaken within individual markets differ in both form and intensity). Moreover, even when the pages devoted to different markets publish posts having the same functions and referring to the same topics or issues, the phenomenon of duplicating exactly the same content or direct translation into other languages does not occur.

## 4. Automotive industry

The impact of social media on the development of business relationships were also examined in the automotive industry. Despite the adverse impact of the recent financial crisis, taking into account the estimates of CAGR 2011–2020, SP12 Forecast Global Insight [Schmidt 2012], the demand for passenger cars will increase by 2020 from 60 million to 100 million. The largest increase is expected in India (16%), China (10%), Brazil (6%), Russia (4%), USA, (3%) and Europe (2%). With regard to premium cars, the estimated increase is even greater: India (24%), China (14%), Brazil (14%), Russia (6%), USA (6%), Europe (1%). This situation is mainly due to the growing popularity of new classes of vehicles such as: SUV, compact and mid-size [Mohr et al. 2013]. Present market activities of automotive companies, relay mainly on diversification of the offer through the introduction of new models. The BMW Group expanded its offer of cars by introduction of new lines: BMW Series 1, Series 2 and Series 4. Due to the great market success of the BMW X5 new models SUV X1, X3 and X4 have been introduced. In addition, since 2006, BMW Group has been developing a line of cars by Mini. Daimler AG behaves similarly, adding to the classic set of Mercedes C, E and S-class the lower segment vehicles: classes A and B and then developed SUV offer: class ML and GL. According to the sales and marketing development strategy presented in 2012 [Schmidt 2012] until 2015, the offer was expanded with ten new models, including new classes CLA, CLS, GLA, GLC, GLE.

Since the days of Henry Ford, who popularised passenger cars pushing standardization (use of the minimum number of common components) and implementing the concept of production line (economies of scale reference), the automotive industry has evolved in the direction of the offer of many brands and variants containing a wide range of elements of standard and optional equipment in full palette of interior and exterior colour. Particular attention should be paid to the growing popularity of unique cars with distinct characteristics produced in smaller quantities. An example would be the Mini brand, whose development in isolation from other BMW group vehicles could simply be non-profitable.

Decisions on standardization and adaptation in relation to the marketing strategy of the automotive businesses is related directly with the dilemma of globalization and localization in consumer behaviour [Łuczak, Senkus and Skrzypek 2016]. The need to use the latest (global) technology does not exclude the desire to own the (local) product tailored to individual needs. Adaptation, therefore, does not mean geographic differentiation but is associated with the satisfaction of individual needs globally. In the case of finished products (cars) one can easily identify standardization as the use of common components and adaptation as a multitude of brands and variants. Standardization and adaptation may, however, also apply

to enterprise communications with customers. The analysis of this phenomenon was carried out on the basis of activity in the most popular social medium of three automotive brands.

The first of the analysed brands of the automotive industry is Mercedes. History of these vehicles starts with the world's first three-wheeled vehicle powered by a combustion engine with an electric ignition presented in 1885 by Carl Benz. Through 130 years of development, thanks to the specialists from Mercedes, modern cars have: gasoline and diesel engines, airbags, seat belt pretensioners, ABS, ESP as well as the latest innovations like Park Assist, Brake Assist, Attention Assist (mercedes-benz.com). Today, Mercedes is synonymous with luxury and safety.

The result of entering the "Mercedes-Benz" in the Facebook search are links to the local Mercedes-Benz Poland profile and the global Mercedes-Benz profile. The global profile is a website which links the entire communication of Mercedes brand with the environment. It boasts over twenty million users around the world. It contains links to sites such as Twitter, Pinterest, Instagram, YouTube and Mercedes-Benz TV. It also has very rich and frequently updated tabs with videos and photos. In the infotainment section, one can find information on the total number of fans (62 million), likes (205 million), shares (9 million) and comments (3 million). These values continue to increase<sup>6</sup>. The content of the page consists of posts presenting the latest information on the brand, products both for passenger cars and SUVs and sport (like the F1 race), cultural and other events, such as consumer electronics trade fair CES in Las Vegas, the introduction of a new model on the market or the New Year celebrations. But the site rarely presents local information of individual countries. Posts are updated very often. The number of likes exceeds a few thousand. Similarly, the posts are often re-shared. The number of comments reach 100 but it may result from the global nature of the profile. Comments are in multiple languages and do not form moderated discussion, but appear as collection of private opinions.

The situation is quite different with respect to the Polish profile. Although the number of users is close to a hundred times less (230 thousand), but the comments show interaction. It is a little surprising that the Mercedes-Benz Poland profile has not been verified by Facebook as "belonging to the company," but this situation also applies to other MB pages. Polish profile content includes mainly reprinted information from other profiles, mainly on the product news and information about events in which Mercedes is involved, but it also includes local posts. It utilizes heavily global advertising materials as: photos, product descriptions, press releases, etc. Local posts include materials prepared in Poland. Profile Mercedes-Benz Poland is very active in terms of cooperation with other entities such as Kukbuk press room or cultural initiative Stacja Mercedes. Mutual support promotes third parties but also

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<sup>6</sup> Data as at 8.01.2016.



diversifies the content presented on the profile. Friendly character is also ensured by the involvement of Polish stage and movie stars such as Happy New Year 2016 wishes sent by Marcin Dorociński as an epigrams recorded in the car on the mobile phone “everyone needs some stars...” by Michał Rusinek. The number of likes for individual posts rarely exceeds 1,000, usually ranges from 200–400. Similarly, the number of re-shared posts is about 60. Higher scores are usually associated with presenting the information (images) about new models and posts on historical cars from the 70s and 80s. Analysis of the comments shows that there is a very active group of people who take an active part in the discussion on the vehicles that they had the pleasure to have, or which they still have. Perhaps this is why Polish MB profile had a very interesting form of promoting the introduction of a new class S. While the global page presented pictures containing the silhouette of the new car and the description of the selected new features, Polish profile presented the photo of the car from the past, highlighting the contemporary advantages, and the photo of brand new model with the slogan encouraging to examine what is new had been pushed into lower right corner. Analysis of the content of the profile shows frequent changes of main photos, numerous competitions and tasks for Internet users. The profile is actively updated and low scores are simply related to a small number of users (Polish language). Facebook page search for profiles associated with the brand Mercedes also displays a Polish version (probably run by fans) Mercedes-AMG PL (91 thousand) and profiles of each model, mostly historical. Mercedes-Benz is also related to Polish events such as the Mercedes-Benz Fashion Weekend Warsaw (15 thousand) or the previously mentioned Stacja Mercedes (17 thousand). In addition, there are also many profiles of car dealers like Mercedes-Benz Warszawa Sp. z o.o. (4 thousand), Mercedes-Benz Duda-Cars Poznań (2 thousand) or MB Poznań Mercedes Benz Poznań (828). They mainly present information on local events. Number of likes and re-shares, if any, does not exceed 10. Comments are sporadic.

Further exploration of results for “Mercedes-Benz” reveals the presence of a number of separate national profiles, among which the largest by the number of users, include: USA \* (4,298 thousand), India \* (2,178 thousand) Türkiye (1,762 thousand), Deutschland \* (855 thousand), Italia \* (755 thousand), Egypt \* (589 thousand), Korea \* (528 thousand), Thailand (514 thousand), UK \* (502 thousand), France \* (500 thousand), Australia \* (387 thousand), Portugal (378 thousand), Romania (355 thousand), Canada \* (299 thousand), Iraq (296 thousand), Brasil (277 thousand), Argentina (254 thousand), Taiwan (250 thousand), Poland (230 thousand), Malaysia (229 thousand), NL \* (229 thousand), Viet Nam \* (202 thousand), Kuwait \* (191 thousand), Österreich (167 thousand), Jordan (161 thousand), Dubai (155 thousand), Indonesia (105 thousand), Belgium (101 thousand), Rosija \* (97 thousand). Marked with an asterisk are the profiles having relationship with the company confirmed by Facebook. It is interesting that the Russian profile, despite the market size was less than 100 thousand. Most of these profiles use common

promotional materials prepared by the brand owner: photos, videos, events and so on. Each, however, has the ability to publish their own materials which looks especially beautiful with pictures of car dealerships in Arab countries. Individual profiles are conducted in local languages and combine transfer of global information with local events. Interestingly, in the Canadian profile some global posts are published twice with the same visual material: English and French (the number of re-shares, likes and comments is similar in both languages).

A very specific profile is Mercedes-AMG \* (3,276 thousand), whose task is to present the description of the latest technologies enhanced by pictures of the most beautiful and best-equipped versions of the Mercedes AMG. The average level of likes is 2–6 thousand. The number of re-shares ranges from 100–200. Despite encouraging users to participate in occasional competitions, the number of comments does not exceed a few dozen. As part of the profile Mercedes-AMG, there are also photos and parameters of older vehicles, but these are less popular. Number of likes in this case is about 500. The next two profiles related to AMG are dedicated to driving school: AMG Driving Academy \* (155 thousand) and US AMG Driving Academy \* (47 thousand). The former is a source of information on events involving Mercedes cars of a global nature, but mainly European. Posts are published every few days. An average number of likes ranges from 100 to 200 although some of the more popular events increase this number to 350. The number of re-shares and comments does not exceed 10. The profiles are for informational purposes only and lack the elements that encourage interaction. The latter is the local version referring only to events in the US. A smaller number of users who like this page makes comments and re-linking sporadic and the number of likes, posts does not exceed 100.

An interesting and particularly popular profile is the Mercedes-Benz Classic Center USA \* (376 thousand). It should be noted that the name is a little misleading, because judging from user activity, the profile is global. Published posts relate to the classic Mercedes models. Beautiful photos of legendary models receive thousands of likes and hundreds of re-shares. The number of comments ranges from 20 to 80, except that they mainly contain the pictures of Internet users' vehicles. Such activity is encouraged by headlines of individual posts. The general rule indicates the relationship, "the older the car, and the more artistic the image, the more likes". Particular attention should be paid to two applications associated with the profile. The first is an exchange site for vintage cars controlled by the Mercedes-Benz. The second is a link to the US branch of MB offering genuine parts for classic cars.

On Facebook, there are many profiles associated with different models of Mercedes cars. These are the profiles run by enthusiasts or groups. However, one of the models lived to see the official profile – Mercedes-Benz G-Class \* (217 thousand). Its content presents not as much the technical parameters of the car as the pictures showing its dual nature: beautiful luxury car finished with the best materials and

off-road vehicle which does not fear any place. The number of likes under each of the posts falls in the range 1,600–3,500 and the number of re-shares is about 150. In addition, each of the posts is accompanied by several dozen comments making up the song of praise for the vehicle. Commenting are two groups of people: the owners and people who want to have such a vehicle. This profile has no language versions so it may be assumed that it is global and comments can come from all over the world.

Describing the Mercedes brand communication in social media it is impossible not to mention the sport commitment of the company. On Facebook there are two official profiles of teams sponsored by Mercedes: Mercedes AMG Petronas \* (10,702 thousand) and Mercedes AMG DTM \* (175 thousand). The former is the English language global profile of F1 team. The latter is a local German profile. Both, however, have a common feature, touching themes of sports competitions, they expose the brand and the company's commitment to the development of the latest technologies. The omnipresent three-spoke star logo is on all elements published online.

A relatively young project is a magazine *She's Mercedes* \* (87 thousand). The oldest posts are from 2011. Currently, each of them receives about 300 likes and 50–100 re-shares. Number of comments does not, however, exceed 40. The site has only an English version, hence the deduction that its content is global, but comments are in English, German and Polish (probably due to the fact that the page *She's Mercedes* is related to the profile MB Poland). The aim of the profile is to present the different areas of women's lives: sport, leisure, travel, work, cooking which can be accompanied by their car. Very interesting is the reaction to the published content. Posts which provide a picture of a beautiful woman (accompanied by the car) generate male discussion. Posts related to lifestyle attract comments from women.

Summing up the analysis of the presence of Mercedes brand in social media, a mention should also go to the profiles on the game of golf – Mercedes-Benz Golf (153 thousand), football and in particular events in stadiums in Stuttgart and Berlin – Mercedes-Benz Arena \* (69 thousand), Mercedes-Benz Arena Berlin\* (49 thousand) as well as the museum of technology – Mercedes-Benz Museum\* (410 thousand).

As can be seen, the presence of Mercedes brand in social media (only Facebook was analysed) is wide. The multiplicity of language profiles and the presence of theme profiles proves far-reaching adaptation of the methods of communication with customers, taking into account not only the language but also the different profiles of their behaviour. This situation gives everyone the opportunity to participate in the discussion on a selected and interesting topic. The global reach of the Internet often verifies the initial assumptions, as in the case of the American page on classic vehicles, which became a global page. It should be noted, however, that the maintenance of the common brand image is possible through a standard set of

promotional materials created top-to-bottom and intended for use on individual profiles. It is therefore impossible to determine directly whether the process of Mercedes brand communication is standard or adaptable as it contains elements of both strategies.

The second analysed brand is the brand of electric cars Tesla. The company Tesla Motors is a relatively young company in the industry because it was established only in 2003. The first car appeared in 2008, and the currently marketed sedan Tesla S has been offered since 2012. Sales of the third SUV class vehicle was announced for mid-2016. Tesla Motors is a company whose goal is to design and propagate electric vehicles. In addition, it offers ready-made solutions applied by companies such as Daimler and Toyota. The main partner is Panasonic as the supplier of battery cells necessary for power storage. Tesla vehicles represent a certain unknown for the entire automotive industry. For many years, companies such as Toyota, Nissan, GM and Daimler and BMW have been working on the use of electricity in their hybrid solutions. Tesla is a vehicle which appeared suddenly and just as quickly gained a leading position in terms of sales volume. Tesla cars are relatively expensive (compared to combustion engine vehicles) and not yet popular. The purchase of such a vehicle is associated with a high risk for the future owner. Persuading consumers to buy Model S should require the insertion of a large promotional efforts.

The search for the phrase “tesla” in the Facebook, search engine returns one profile identified as the original, and a dozen profiles of individual Tesla dealerships, mainly from Germany. The global Tesla Motors profile has over 1.2 million users. Although the earliest entries are from 2003, its activity began only with the introduction of the first model in 2008. Currently, most of the presented posts receive over 1,000 likes. Those, that relate to the presentation of the new features receive as many as several thousand. Similarly, the number of re-shares in such cases reaches several hundred. Compared with the number of users, this is a pretty good result. The content of posts is mostly about the possibilities for the use of the vehicle. Attention should be paid to the fact that the company currently sells only one model of the car. So there is no possibility to publish as much information about new products as Mercedes does. However, all published posts end with a stormy discussion in the comments. Graphic materials presented on the profile are mostly company materials developed by the company. More numerous than in the previous example, however are photographs submitted by users. The same applies to content that is much more private and family-oriented. The profile links to other Tesla sites like Pinterest, Instagram, YouTube, or Tesla TV. Photos and video tabs display rich content.

Further search for the phrase “tesla” reveals the presence of two additional profiles. The first is Tesla Motors Student Center liked by nearly 32 thousand users. The profile focuses on communication with students who exhibit an interest in working in the Tesla team. This profile has been available since 2012. The number

of likes does not exceed 100 per post but remarkable is the number of comments. Most of the entries are associated with competitions and tasks for users. Reward for participation is the opportunity to start internship or work at Tesla. The second profile found is Tesla Gigafactory (2 thousand), related to the information about the project to build the biggest battery factory for future automotive industry.

Despite high expectations regarding the innovative product of the young company, its communication in social media, unfortunately, can only be described as developing. Perhaps it is still too early, perhaps it is due to still too small share of electric vehicles in the car market in general, but in the assessment of Authors Mercedes' actions are more transparent and visible.

Yet another concept of communicating with customers has been adopted with regard to the Volkswagen brand. This brand is one of several brands of cars offered on the global market by Volkswagen AG. It consists of several models of passenger cars from small up! to the largest Pheaton. Despite the name "car for the people" VW cars are characterized by both, good brand perception and technical parameters. It is proved by the sale results. Along with Toyota, Volkswagen is one of two leaders in sales of passenger cars globally.

The search for phrase "volkswagen" on the Facebook page returns one global profile of Volkswagen which has more than 24 million users. The profile has a very rich and updated photos and videos tab. They are mainly materials prepared by VW. The content of the global site is almost exclusively information about new products and product features or related to sport events and holidays. It is interesting that 24 million users translate to the average number of likes under posts of 100–200. The most popular posts were related to the film with "easter eggs" during Easter 2015 (13 thousand), a film about the history of the development of the model Golf (3.8 thousand), reveal of brand new Golf GTI in the game Gran Turismo Sport (1.9 thousand) and a picture of VW logo cut out in a pumpkin (1.8 thousand). With reference to the incident with emissions scandal, the global fanpage has one post in 2015 (on the German fanpage there are three and in the US profile one, in the Polish language version – none). The average number of comments does not exceed a dozen. The profile in the assessment of Authors serves rather the provision of information than establishing communication with customers.

With regard to the profile localisation for the individual markets, the profile regionalization has been used. In the settings there are most languages including Polish. The number of users is given, however, in total, and as mentioned earlier it is common for all languages (24 million). The content of posts in the Polish profile is painfully reminiscent of the global page. Presented is mainly information about the products and their characteristics. Attention should be paid to the fact that the number of likes is at a similar level as at the global page, around 500. There is also information about sports events or Christmas wishes. Reading through the posts, one gets the impression that only accepted information is presented, conveying

a positive image. Use of local materials is seldom, e.g. images of Robert Korzenio-wski and the new Passat Alltrack. Posts lack a spontaneous and personal nature in comparison with the example of Tesla and Mercedes. The difference appears only in the analysis of comments. While the previously described cases often encourage people to take action, the response of the profile was very rare and limited e.g. to determining the winner. With regard to Volkswagen, the active participation of the team responsible for the profile in moderating the discussions is very positive. Answers to questions asked in the comments are very common and often include links to financing methods, configuration pages or other replies. On the surface of dry information presentation, closer examination reveals communication with the user.

A similar model of communication can be found in other language versions of the profile. A standard set of information to publish on the timeline related to product news, festivals and other events, especially sports. The most popular language version is the German version. The number of likes under posts ranges from 1,500–3,000 and the number of re-shares is up to 100. Comments are very similar and notable is their moderation by a team. Very often there is information about sporting events in which Volkswagen participates.

To summarize, Volkswagen communications in social media is essentially very well prepared. Available tools are used properly. Published materials have a high standardization of components and the manner of providing information, as compared to previous examples it seems very formal. However, the discussion in the comments and the activity of the teams responsible for it is much more noticeable.

## Conclusions

Presented above, the empirical analysis of the use of social media to build relationships with customers from the perspective of business strategy of selected industries proves that we are dealing with a complex phenomenon and does not indicate one size fits all approach in this respect. Electronic marketing tools in the form of social media provide many tools for contact and dialogue with the customer. The nature of the dialogue depends not so much on the technical possibilities as the strategy and the characteristics of clients in specific markets. With respect to the selected brands, one can make the following observations:

1. All companies, in their actions, to a greater or lesser extent, are trying to develop these relationships.
2. Most companies prepare local profiles or provide language versions of their profiles to fit their content to local circumstances.
3. Most companies use a standard set of promotional materials, or at least create local versions according to a standardized formula.

4. Standard message concerns the common elements in the global market (products, description of functions), adaptation is associated with the use of local events or moderating discussion in the various consumer groups.
5. In the case of the automotive and brewing industries, the increased role of moderating the comments was noted, but in the opinion of the Authors, this level is still insufficient in comparison with the possibilities offered by electronic tools of social media.

The phenomenon of using social media to form relationships with customers is an interesting analytical basis due to its dynamic nature. The direction of development of this phenomenon is expected in the growth of levels of communication moderation with customers. However it also poses a new challenge for the companies to further develop their strategies, policies and structures so that they fully go in a line with relationship business model [Deszczyński 2016b].

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