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PROGRAMMING AS A DEVELOPMENT TOOL OF RUSSIAN SCIENCE: EVOLUTION, FEATURES AND APPLICATION PROSPECTS

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K e y w o r d s: programming, science, scientific and technical progress, state program.

A b s t r a c t

Currently, the most important preconditions for efficient development of the Russian economy include improvement of production infrastructure, use of advanced technologies and scientific support of economic processes, both nationally and in certain regions.

In this connection, scientific development, the performing of fundamental and applied research, activation of innovative activity of Russian enterprises and integration of science and production have become the most relevant issues.

As it is proved in practice, programming is an efficient tools for management of sectorial processes and may be effectively applied in coordination of the development of scientific processes in a certain territory.

Aspects of programming evolution and the peculiarities and prospects of the use of this toolset under modern economic conditions are considered in this article, along with recommendations for improvement of management of Russian scientific and research activity.

The authors also designed an algorithm for a scientific and research activity development program at the regional level that produces a systemic vision of the conditions necessary for implementation of scientific and innovative potential of the development of the economy of a certain territory.

This algorithm produces a detailed understanding of the conditions necessary for implementation of the scientific and innovative potential of the development of a regional economy. Moreover, this algorithm assists in forming an efficient toolset for management of scientific and research activity and improving the competitiveness of the territorial economy.

PROGRAMOWANIE JAKO NARZĘDZIE ROZWOJU ROSYJSKIEJ NAUKI – EWOLUCJA, CECHY I PERSPEKTYWY ZASTOSOWANIA

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S ł o w a k l u c z o w e: programowanie, nauka, postęp naukowo-techniczny, program państwowy.

Abstrakt

Udoskonalenie infrastruktury produkcyjnej, wykorzystanie zaawansowanych technologii oraz naukowe wsparcie procesów gospodarczych, zarówno na poziomie całego państwa, jak i pewnych regionów, to obecnie najważniejsze warunki wstępne do sprawnego rozwoju rosyjskiej gospodarki. W tym kontekście rozwój nauki, realizacja badań podstawowych i stosowanych, pobudzanie działalności innowacyjnej rosyjskich przedsiębiorstw oraz integracja nauki z produkcją stają się najistotniejszymi zagadnieniami.

Jak wykazano w praktyce, programowanie jest jednym ze skutecznych narzędzi zarządzania procesami sektorowymi i może być z powodzeniem stosowane do koordynowania rozwoju postępu naukowego na pewnym terytorium. W artykule zawarto rozważania nad aspektami ewolucji programowania, szczegółami oraz perspektywami wykorzystania tego zestawu narzędziowego we współczesnych warunkach gospodarczych. Zarekomendowano propozycje poprawy zarządzania rosyjskimi działaniami naukowymi i badawczymi. Autorzy opracowali także algorytm do projektowania programu rozwoju działalności naukowo-badawczej na poziomie regionalnym, który pozwala na uzyskanie systemowej wizji warunków koniecznych do wykorzystania potencjału naukowego i innowacyjnego rozwoju gospodarki danego regionu. Ponadto algorytm ten pomaga w stworzeniu skutecznego zestawu narzędzi do zarządzania działalnością naukowo-badawczą oraz poprawy konkurencyjności gospodarki na danym obszarze.

The nature and characteristics of programming

Scientific programming involves the development and implementation of programs and is one of the most popular instruments in the world for managing research and innovation, ensuring the achievement of certain goals through the use of available resources (BILCHAK, NOSACHEVSKAYA 2011).

Traditionally, the content of the program is related to the definition of the main strategic goals, sub-goals in their chain of command, steps to achieve goals set to link actions to achieve the sub-goals, the definition of entities participating in the program, implementation mechanism, including sources of funding, methods of stimulation, responsibility, etc.

The essential features of a performance-based approach are as follows: the program is focused on the end result and is considered as a whole system, irrespective of the affiliation of its constituent elements; the program provides for certain financial, material, labour and other resources for its activities and is linked with other programs at the same level. Management of the program is carried out by the redistribution of rights, duties and responsibilities of existing organizational structures, as well as the use of different forms of coordination.

Evolution of the program and target methods in economics

In general, the beginning of the program-target method is related to the scope of state regulation and was typical of the industrialized countries in Europe from the early 1930s to the mid-1960s.

This method is relatively common, especially in the U.S., and is used to target the formation of fiscal policy and is seen as part of a continuous plan. Extensive experience in developing and implementing government programs, including science and technology, has accumulated in Russia.

National science and technology programs, developed at the state level in order to focus on the priority areas of scientific and technological progress and accelerate the development on this basis of knowledge-intensive industries, have transformed the image of the productive forces of the country, as well as for a complex perspective of basic research using competitive projects in accordance with relevant scientific advice.

The well-known and detailed shortcomings of the national science and technology policy under an administrative-command system were largely why the country has not managed to create a comprehensive system of management of scientific and technological development in collaboration with the productive sector.

In the 1990s, a variety of special programs, including those related to the development of research, were not supported by adequate financing from the federal budget.

Improving the approaches to the application of programming

In the early 2000s, a number of activities were taken at the state level to reform the procedures for implementation of federal programs and to consolidate positive trends in certain sectors and regions.

Insufficiently regulated implementation of earlier federal programs acquired during this period form a more efficient model to achieve the objectives.

In particular, to streamline the management of federal target programs at the state level, the priorities and criteria for the formation of such programs have been implemented. It is possible to give the entire set of programs a more targeted focus.

Limiting the number of federal programs and their projects will meet the funding needs of the federal budget and begin to implement the principle of full funding of programs in a timely manner.

As a result of the work done in this period, the structures of the federal target programs have been optimized and programs not meeting government priorities have been eliminated. This ensured concentration of funds and their allocation to the addressed priorities.

Personal responsibility for their conduct was also introduced in order to optimize the management structure of federal target programs.

Where specified, a state procurement coordinator has been made responsible for the preparation and implementation of federal programs, funding, coordination of state customers and reporting on the implementation of programs.

In addition, changes were made in the order of development and implementation of federal programs to adjust the program objectives and the timing of their implementation, the feasibility of further implementation of the program and to reduce the share of the program activities at the expense of the federal budget to ensure the full and timely funding for the program through non-budgetary sources and budgets of the Russian Federation.

However, there were problems which significantly reduced the effectiveness of federal programs. Part of the federal programs did not contain specific program activities, timing or evaluation of possible outcomes of their implementation. In a number of newly-approved program lists, there were no specific investment projects indicating multi-year sources of funding.

Government customers generally willingly accept the indicators which show the overall progress of financing and the expected results for the entire period of the program and do not pay much attention to the specific indicators of the progress or results of the program activities.

The absence of these indicators reduced the efficiency of the federal program as a holistic system instrument for achieving results, making it impossible for a substantive and comprehensive analysis of proposed federal programs, as well as evaluating the effectiveness of program activities and a follow up of their implementation.

Prospects for the use of a program-target approach in Russia

At present, programs are the basis of state regulation of the economy, in the world in general and particularly in Russia and they have become increasingly sophisticated. Overcoming the contradicting interests of the performance-oriented industry and the departmental management principles significantly improved methods of development and implementation.

A state program is a system of activities interrelated by task, timing and resources and public policy instruments that provide a framework of key

government functions to achieve the priorities and objectives of the state policy in the sphere of socio-economic development and security.

While implementing governmental programs, as opposed to implementation of federal programs, the problems arising with integration can be identified. It is important that when using governmental programs in financial planning it is required that uniform rules for all programs be created. Further, the diversity and specificity of branch management to integrate these policies is required.

There is now also a potential basis for the relationship between the federal, regional and municipal programs. The content of the state program of this relationship is provided and would potentially encourage greater interaction between the federal centre and the subjects of the Russian Federation.

Programming of national science and technology

In the context of the article, it is important to elaborate on the specifics of the structure and content of the draft state program of the Russian Federation, „The development of science and technology" (planned implementation period – up to 2020).

The project of the state program attempts to combine the funds intended for the development of science and technology in a policy document, which appears to strengthen their budget management.

Herewith, it is important to note that in recent years, the state budget funds of Russia are the major source of the research financial support (Fig. 1).

The draft state program has seven sub-programs. Activities for basic research in the subroutines are present: „Basic research and development of the academic sector of science", „Development of university research", „Institutional development sector research and development" and „Development of international cooperation in the field of science".

The draft state program provides for the development and adoption of policies for basic scientific research, which includes as a separate block of the program of fundamental research of the state academies of sciences, as well as plans for basic research conducted by public research foundations, national research centres, government research centres, leading industry research organizations and universities.

Thus, in our view, in the context of the solution of the modernization of the Russian economy and, in particular, extra-budgetary funds of enterprises to implement research projects and implementation of new technologies in the production process in the project of the state program, not enough attention is paid to the development of the sphere of industry research and development.

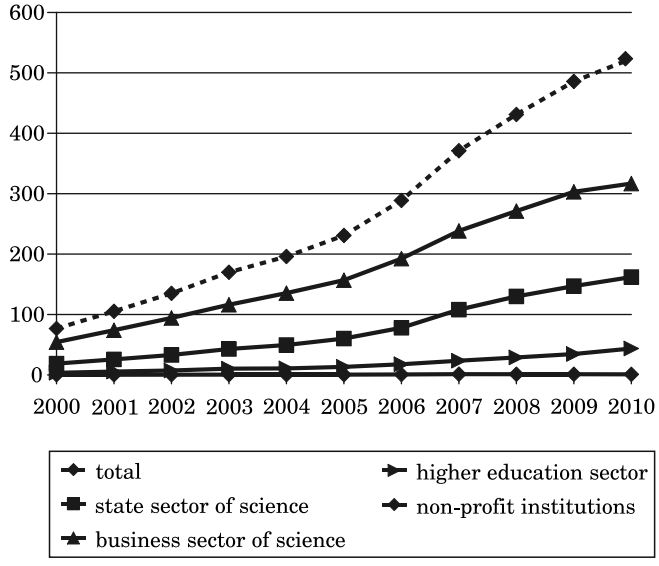

Fig. 1. Dynamics of internal expenses for research and development by sectors of science, billion rubles
Source: calculated by the author based on the data of Rosstat.

Today it is one of the most important tasks, without which the activation of the innovative activities of economic entities in Russia is difficult.

Note also that the draft state program requires the large participation of the federal executive bodies (Ministry of Education and Science of Russia, Minkonomrazvitiya Russia, Russian Finance Ministry, Rosatom, Rospatent and others) in the implementation of routines and activities. It is assumed that they will participate in setting priorities for research directions and directly conducting basic research. In this case, the Russian Ministry is the focal point of the national scientific research funded by the federal budget.

In the enlarged form of the state program is a project description of the current state of affairs in the country's science and technology with proposals to change the trends in some areas.

The total current project state program assumes research and development in eight major topic areas. Among them – IT-technology, biotechnology, medicine and health, new materials and nanotechnology, transportation and space systems, environmental management, energy efficiency and conservation and interdisciplinary research of a socio-economic nature.

As for the timing of the approval of the state program „Development of science and technology", it is set out in the Decree of the President of the Russian Federation – of 31 December 2012 (Presidential Decree *On the long-term*... 2012).

At the present time, the coming months will see the implementation of the state program, „Development of science and technology" and a number of other related programs to identify and classify the problems and challenges in the modernization of economic processes in the country. They also offer solutions and create conditions for the widespread introduction of advanced domestic developments in production, output regions and the country as a whole for international markets of advanced technology.

It may also be advisable to allocate even more budget resources to focus on the priority areas of science and technology. One must determine not only a common approach to the implementation of these directions, but also to develop specific mechanisms in support each of them. In areas with the most obvious technological deficits, it is advisable to make appropriate institutional arrangements, for example, to generate specific technological projects implemented on the basis of federal centres of science and high technology, as well as to reorient the individual national research centres for the development of high technology in these areas.

As part of these processes, development, implementation and coordination of state programs, not only at the federal level but also regional development programs for science, can be clearly one of the most effective management tools and research and innovation activities in the country.

Mathematical approaches to the development of science programming

The application of mathematical methods within programming makes it possible to form both the current and prospective quantification of key factor transformation, ensuring effective functioning of the scientific program under various conditions. This evaluation makes it possible to predict possible changes in the development of the research and innovation activity modifying the quantitative value of various key factors.

In this connection, the key factors ensuring effective functioning and relevant results of research and innovation sectors functioning include the following:

– scientific personnel (personnel engaged in research and development; hiring and dismissal of scientific personnel);

– financial support of research and development;

– material and technical facility of science (basic means of research and development; machinery and equipment);

– efficiency of research and development at different stages of their introduction into the economy (publishing of local authors in scientific maga-

zines; application of patents and issuance of patents in Russia; creation and use of advanced production technology; volume of innovative products, works and services; expenses for technological innovation).

For evaluation of this functional dependence, various statistical indicators characterizing the process and results of the scientific activity were considered.

For the collection of these indicators, correlation and regression analysis methods were applied. This made it possible to analyse the set of indicators required for the construction of a statistically and mathematically significant model: personnel engaged in research and development; internal expenses for research and development; cost of machinery and equipment for research and development; number of mechanical patents issued in Russia.

Evaluation of the parameters significantly influencing the number of issued mechanical patents is implemented in two stages. At the first stage, the indicator of the issued mechanical patents per researcher was evaluated with the following ratio:

$$\text{patents}_{\text{lab}}(t) = F(\text{equip}_{\text{lab}}(t), \cos ts_{\text{lab}}(t), \theta$$

when:

$\text{patents}_{\text{lab}}(t)$ – issued mechanical patents per 1 researcher;

$(\text{equip}_{\text{lab}}(t)$ – cost of machinery and equipment used for research and development per 1 researcher, at the time t;

$\cos ts_{\text{lab}}(t)$ – internal expenses for research and development per 1 researcher, at the time t;

θ – set of parameters to be evaluated.

At the second stage, the indicator of the issued mechanical patents per researcher was evaluated with the following ratio:

$$\text{patents}(t) = \text{patents}_{\text{lab}}(t) \times \text{labor}(t)$$

when:

$\text{patents}(t)$ – issued mechanical patents;

$\text{patents}_{\text{lab}}(t)$ – issued mechanical patents per 1 researcher, at the time t;

$\text{labor}(t)$ – personnel engaged in research and development, at the time t.

For evaluation of the type of function $F(\text{equip}_{\text{lab}}(t), \cos ts_{\text{lab}}(t), \theta)$ and the set of parameters θ, the statistical data for a certain period of retrospection for both the whole country and for individual regions were used. Methods of regression analysis were applied to these data.

The best approximation of the number $\text{patents}_{\text{lab}}(t)$ was achieved using the multiplicative function:

$$F(\text{equip}_{\text{lab}}(t), \cos ts_{\text{lab}}(t), A, \alpha, \beta) = A \times (\text{equip}_{\text{lab}}(t))^{\alpha} (\cos ts_{\text{lab}}(t))^{\beta}$$

when:
A, α, β – set of parameters to be evaluated.

Evaluation of the set of parameters A, α, β was achieved using the method of least squares applied to the function F *in* Napierian logarithms:

$$\text{In } F = \ln A + \alpha \times \ln(\text{equip}_{\text{lab}}(t)) + \beta \times \ln(\cos ts_{\text{lab}}(t))$$

Values of the main quality characteristics of the constructed regressions indicated their importance.

The indicator of advanced manufacturing technologies was chosen as a key indicator for characterization of the functional dependence of conversion of new knowledge into new technologies and innovation, the evaluation of this indicator was implemented with the following ratio:

$$\text{tech}_{\text{new}}(t) = G(\text{patents}(t), \theta)$$

when:
$\text{tech}_{\text{new}}(t)$ – number of advanced manufacturing technologies at the time t;
patents (t) – number of issued mechanical patents, at the time t;
θ – set of parameters to be evaluated.

For evaluation of the type of function $G(\text{patents}(t), \theta$ and the set of parameters θ as in the previous case, the statistical data for a certain time period were used. Methods of regression analysis were applied to these data.

The best approximation of the number $\text{tech}_{\text{new}}(t)$ was achieved using the additive function:

$$G(\text{patents}(t), \theta) = a^G + b^G \times \text{patents}(t)$$

when:
$a^G + b^G$ – set of parameters to be evaluated.

Evaluation of the set of parameters $a^G + b^G$ was achieved by the least squares method.

Values of the main quality characteristics of the constructed regressions indicated their importance.

For evaluation of the functional dependence of introduction of new knowledge and technology in the real sector of economy, the application of advanced

manufacturing technologies was chosen as a key indicator and was evaluated with the following ratio:

$$\text{tech}\ (t+1) - \text{tech}\ (t) = H\ (\text{tech}_{\text{new}}\ (t),\ \text{tech}_{\text{imp}}\ (t),\ \theta$$

when:

tech (t) – number of the applied advanced manufacturing technologies at the time t;

$\text{tech}_{\text{new}}\ (t)$ – number of the invented advanced manufacturing technologies at the time t;

$\text{tech}_{\text{imp}}\ (t)$ – number of the imported advanced manufacturing technologies at the time t;

θ – set of parameters to be evaluated.

The best approximation of the number (t) was achieved using the additive function:

$$H(\text{tech}^{3n}{}_{\text{ew}}\ (t),\ \text{tech}_{\text{imp}}\ (t),\ \theta) = a^H \times (\text{tech}_{\text{new}}\ (\text{tech}_{\text{new}}\ (t) + \text{tech}_{\text{imp}}\ (t))$$

when:

a^H – parameter to be evaluated.

Evaluation of the parameter a^H was achieved by the method of least squares. Values of the main quality characteristics of the constructed regressions indicated their importance.

Evaluation of the volume indicator for innovative goods, works and services was implemented with the following ratio:

$$\text{innov}\ (t) = I\ (\text{tech}\ (t),\ \theta$$

when:

innov (t) – volume of innovative goods, works and services at the time t;

tech (t) – number of the applied advanced manufacturing technologies at the time t;

θ – set of parameters to be evaluated.

The best approximation of the number (t) was achieved using the additive function:

$$I\ (\text{tech}\ (t),\ \theta) = a^I + b^I \times \text{tech}\ (t)$$

when:

$a^I + b^I$ – set of parameters to be evaluated.

Evaluation of the set of parameters $a^I + b^I$ was achieved by the method of least squares.

Values of the main quality characteristics of the constructed regressions indicated their importance.

The number of indicators characterizing the scientific activity was also taken into account for the model.

Characteristics of the number of personnel engaged in research and development was implemented with the following ratio:

$$\text{labor}\ (t+1) = \text{labor}\ (t) + \overrightarrow{\text{labor}\ (t)} - \overleftarrow{\text{labor}\ (t)}$$

when:

$\text{labor}\ (t)$ – personnel engaged in research and development at the time t;

$\overrightarrow{\text{labor}\ (t)}$ – hired scientific personnel for the period t;

$\overleftarrow{\text{labor}\ (t)}$ – dismissed scientific personnel for the period t.

Formation of the value of machinery and equipment for research and development was implemented as follows:

$$\text{equip}\ (t+1) = \text{equip}\ (t) - \text{equip}\ (t) \times \mu + \overrightarrow{\text{equip}\ (t)}$$

when:

$\text{equip}\ (t)$ – value of machinery and equipment for research and development at the time t;

$\overrightarrow{\text{equip}\ (t)}$ – increase in value of machinery and equipment for research and development, for the period t.

μ – rate of depreciation of machinery and equipment for research and development.

Thus, the mathematical model reflecting the relationship of the key factors influencing the development of the research and innovation activity, can be given as the following system of equations:

$$\text{patents}_{\text{lab}}\ (t) = A\ (\text{equip}_{\text{lab}}\ (t)^{\alpha}\ (\cos ts_{\text{lab}}\ (t))^{\beta},\ t \in \{1,...,\ nt\};$$

$$\text{patwnts}\ (t) = \text{patents}_{\text{lab}}\ (t) \times \text{labor}\ (t),\ t \in \{1,...,\ nt\};$$

$$\text{labor}\ (t) = \text{labor}\ (t-1) + \overrightarrow{\text{labor}\ (t-1)} - \overleftarrow{\text{labor}\ (t-1)},\ t \in \{1,...,\ nt\};$$

$$\text{equip}\ (t) = \text{equip}\ (t-1) \times (1-\mu) + \overrightarrow{\text{equip}\ (t-1)},\ t \in \{1,...,\ nt\};$$

$$\text{equip}_{\text{lab}}(t) = \frac{\text{equip}(t)}{\text{labor}(t)},\ t \in \{1,\ldots, nt\};$$

$$\cos ts_{\text{lab}}(t) = \frac{\cos ts(t)}{\text{labor}(t)},\ t \in \{1,\ldots, nt\};$$

$$\text{tech}_{\text{new}}(t) = a^G + b^G \times \text{patents}(t),\ t \in \{1,\ldots, nt\};$$

$$\text{tech}(t) - \text{tech}(t-1) = a^H \times (\text{tech}_{\text{new}}(t-1) + \text{tech}_{\text{imp}}(t-1)),\ t, \in \{1,\ldots, nt\};$$

$$\text{innov}(t) = a^I + b^I \times \text{tech}(t),\ t \in \{1,\ldots, nt\};$$

Using this mathematical model, the forecast for changes in the values of the key result indicator was prepared: the number of advanced manufacturing technologies invented in the country, with different variations of values of other indicators and, respectively, with different scenarios.

The results of approbation of this model by the example of the Russian Federation indicate that the model can be useful in the study of the scientific and innovation potential both, at the national level and at the level of individual regions.

Approbation

The following stages are suggested as the main ones for the algorithm of designing of scientific and research activity development program at the regional level:

– determination of tasks and objectives of the program;

– identifying peculiarities of development of scientific activity in the region based on opinions of academic, high-school, sectorial scientific, business community, representatives of state authorities, experts, including international ones, the public, and other interested persons;

– formulation of strategic priority lines of scientific and research activity development in the region taking into account finding out of the main sectors of regional economy in which application of the new technologies may bring significant economic effect;

– forming and implementation of the program measures (considering financial, staff-related, methodological, informational and other resources provision), purposed for achievement of the main objective of implementation of the program and the respective tasks.

In the framework of this stage, it is necessary to determine for each region the priority measures, including stock-taking and optimisation of the functioning of the scientific organizations located within the region and the creation of necessary organizational, legal and other infrastructure, etc. Special attention should be paid to the development and testing of stimulation mechanism for

off-budget financing of scientific research work, as well as to forming a system of monitoring and forecasting of needs of economic entities of the region for scientific and engineering projects. Arrangement of efficient management of the program and control of the progress of implementation will be the expected results.

Implementation of the suggested algorithm creates favourable economic, organizational, legal and other conditions for improvement of the efficiency of scientific and research activity, processes of scientific support of sectors and development of innovative activity at the regional level.

Conclusion

The main goal of optimal control of Russian science in modern conditions are as follows: efficient use of available resources and the results of research activities, with its growth corresponding to the future social and economic needs of society.

Translated by AUTHORS

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PERCEPTION OF CSR AS AN ENTERPRISE BUSINESS OFFER

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K e y w o r d s: social responsibility, changes, strategy, choice, research.

A b s t r a c t

This paper analyses CSR implementation – (Corporate Social Responsibility) in an enterprise as a strategy. In spite of the theoretical and practical applications, there are still methodological concerns regarding its use, particularly as a tool and business model. This paper identifies some important software projects for the promotion of CSR. The conditions were assessed in connection with strategy formulation and objective acceptance in terms of CSR. The results of own research regarding the perception of CSR are also presented and are beneficial for CSR adoption in practice. The search for an effective CSR consensus should be possible and plausible, especially as it relates to P. Drucker's view that „...public interest should be an enterprise's interest".

PERCEPCJA CSR JAKO OFERTY BIZNESOWEJ PRZEDSIĘBIORSTWA

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S ł o w a k l u c z o w e: odpowiedzialność społeczna, zmiany, strategia, wybór, badania.

A b s t r a k t

Praca dotyczy problemu oceny znaczenia wdrażania zasad CSR (Corporate Social Responsibility) w przedsiębiorstwie jako motywu strategicznego. Mimo dokonań teoretycznych i praktycznych, nadal pozostają wątpliwości metodyczne co do jego zastosowania, szczególnie jako narzędzia i modelu biznesowego. W pracy wskazano niektóre ważne programowo przedsięwzięcia na rzecz propagowania idei CSR. Oceniono przesłanki związane z formułowaniem strategii oraz przyjmowaniem celów dla przedsiębiorstwa w kontekście CSR. Zaprezentowano wyniki badań własnych dotyczących percepcji podejścia do CSR. Są korzystne, aby je wdrażać w praktyce. Poszukiwanie skutecznego dla CSR konsensusu wśród interesariuszy należy uznać za możliwe i przekonujące, tym bardziej że wyraża ono realizację postulatu P. Druckera „...aby wszystko, co rzeczywiście leży w interesie publicznym, stało się interesem własnym przedsiębiorstwa".

Introduction – the necessity of seeking the consensus

The promotion of responsible business is the main idea of a project carried out in 2011 by the RP association of employers (Pracodawcy RP), financed by the European Union. The aim of the project is to create standards for businesses which want to be treated as socially responsible. Although social responsibility can entail a competitive advantage (RASZKOWSKA 2011), the status of social responsibility has to relate to changes of business strategies and redefinition of the business model. According to K. Obłój, the model has three interrelated elements: resources, competencies and the configuration of their connections. With so many possibilities for making choices within those areas, the company may formulate and implement versatile strategies (OBŁÓJ 2010, p. 97). Resources that are expanded by CSR (Corporate Social Responsibility) are the main element or condition of those choices.

Seeking business formulas related to social issues has been taking place for years, although two rules – charity and stewardship – stem from the 19th century (RYBAK 2004, p. 15). According to this concept, businesses and their owners supported the idea of corporate charity, encouraging enterprises to unite their efforts to help the poor and needy. Stewardship meant that rich people managed the goods in the name of others, hence their actions were supposed to be in the public interest, based on social confidence.

It should be noted that the CSR formula refers to social economics, known for its long tradition, but its priorities relate to the requirements of managerial economics.

Nowadays, CSR is seen as a concern for the negative consequences of business actions. If they occur, the company should mitigate them. The same rule is applied when the managers take actions towards protecting and supporting social interests even if there are no direct economic or technical benefits for the organization. It is also the reason for challenging whether a business is the right entity to be a participant in socially important projects. In this case, it may be suspected of acting with cold calculation. Another criticism refers to the impossibility of taking into consideration all stakeholders' concerns – the main assumption of CSR. As a result, other dilemmas appear concerning methodology and effectiveness. M. Friedman states that the only manifestation of social responsibility is earning money (the business *of business is business*), and managers have a *so-called fiduciary duty* to shareholders to contribute to the increase in value (FRIEDMAN 1993, p. 127–128). Business skills concern a specific economic activity. Social commitment may result in business exploitation of the environment, improving managerial positions and lead to conflicts of interest (STONER et al. 1997, p. 114).

That is why there is a necessity of consensus for the acceptance of the

theoretical and practical values of CSR. As a starting point, P. Drucker's opinion may be taken into consideration. For him, consensus in social responsibility is found in specific managers actions so that *„everything that is in the public interest becomes the business interest"* (DRUCKER 1994, p. 418). In practice, it means changing the opinions of those who see CSR as a departure from business principles and those who consider it a solution to social problems.

There are on-going works strengthening the methodological basis of CSR, for example, M. Porter and M. Kramer's business proposal called CSV (Creating Shared Value) (PORTER, KRAMER 2012). As far as methodology is concerned, CSV is a way of defining HVC (Hybrid Value Chain) which symbolizes the connection of „two different drivers" of the business model (BUDNICH, SERENEELS 2012, p. 8). Another interesting proposal is R. Kanter's concept of social institution. This concept is a result of research over 20 years across four continents on the activities of socially-oriented enterprises (KANTER 2012).

Support from institutions and programs

The project realized by RP employers is another link in the chain of various initiatives that aim to promote CSR. This topic is also often discussed in the Harvard Business Review (Polish edition). The two cases combine previous international initiatives, for example: *European Manifest of Enterprises* (rejecting the isolation of the business world from social problems), the United Nations (UN) program *Global Compact in 1999* the *Green Paper of Corporate Social Responsibility* and the Polish *Forum Odpowiedzialnego Biznesu FOB* (Forum of Responsible Business) that started in 2000. It is worth mentioning the program *European Friendship for Responsible Business 2005* which included 63 projects in 29 European Countries.

Throughout 10 years of the FOB's (Forum of Responsible Business) existence, the following have resulted: conferences and executive meetings, publications about theoretical aspects of corporate social responsibility and best practices used in Polish enterprises (including small and medium ones) (MAZUR-WIERZBICKA 2008, p. 147, 148). The results of empirical research showed that businesses which use CSR tools and procedures are more effective, whereas their employees are more enterprising and mobile. International research on the influence of social risk management on business value provided similar results. In spite of many positive premises, the question arises as to whether it is a manifestation of political correctness or a civic attitude[1]. Argumentation about the positive influences of CSR may be

valid when CSR takes places in the process of formulating and implementing business strategy. This opinion is shared between many managers and management theorists.

Business creators – avoiding principality

A significant author for CSR is P. Drucker. The combination of two elementary interests (public and business) should be analysed in detail. Its objective is to show that the union of those interests is possible and effective.

Based on reports of the Social Invested Forum, J. Gustafson states that CSR implementation has become a motto and element of the strategy for innovative businesses. This brings positive results as shown in the form of measurable and qualitative data. Moreover, assets connected with ethics, environmental protection, and corporate social responsibility increase dramatically. This enables enterprises to obtain access to capital which otherwise would be out of their range (GUSTAVSON 2007, p. 191, 192).

Research among consumers from 23 countries carried out in the early 2000s indicated that there was a concept of business „citizenship". This means that enterprises which only care about their reputation and turnover put themselves at risk when clients discovered the enterprise's attitude towards social activities.

Another crucial matter is risk assessment related to the implementation of CSR strategy. If enterprises deal with too many CSR activities, their results may have a lower business value. They focus on risk identification and management instead of exploring strategic differentiation of CSR activities.

G. Gibbons pointed out that strategic differentiation requires a planning scheme of economic activity that matches specific conditions. The aim of the scheme is to maximize the possibilities resulting from social issues and provide protection against the risk The effect of the scheme is a program that leads to social activities and, therefore, boosts business resources.

J. Surdyk links the problem of CSR strategy with the increasing attention of enterprises paid to reports by the Global Reporting Initiative. The implementation of a CSR strategy must overcome many obstacles and doubts. An enterprise that achieves its objectives may be seen as not fully committed. Further concerns relate to a reduction in business development while incurring additional expenses. At the same time, talented managers may be focused on burdensome additional tasks, while less-talented rivals are not so encumbered (SURYK 2007, p. 198–201).

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[1] Subtitle of a conference organized by Wroclaw University of Economics , Wroclaw 9–10.05.2011.

Moreover, strategic CSR assumes that moral principles are obeyed. An example of that is the Ethical Code of Conduct created by RP Employers (RASZKOWSKA 2011). S. Newell suggests the following: „If we have an ethical dilemma related to immoral solution, we may answer several questions, such as: what will happen when the stakeholders discover the solution and its results? Will the decision influence the long-term interests of the company? Are unethical organizations attractive for employees?

Ethics is also classified. The lowest level is social duty (as defined by legal regulations), a higher level is social sensitiveness (influenced by stakeholders' opinions), and the highest level is social responsibility (a program of proactive actions aiming at improvement of social conditions).

These opinions show the clear benefits associated with CSR strategy. Extreme caution is also recommended due to the need for starting „from scratch" and to resist being satisfied with superficial actions or their excessive diversity. Comprehensive management models have been formed related to CSR where the process of creating and implementing strategies binds them together. Consensus exists only when CSR effects are planned and measured.

Agreement with business targets

In theory, we may distinguish three methods of creating business targets: normative, systemic and behavioural. In the normative method, the maximizing of profits is the basic and standard criteria. Other objectives may act as constraints. In the behavioural method, the premises resulting from research indicate target versatility and even their lack of clarity. Alternatives for the normative method (profits-driven) are varied. For example, there is only one non-profit objective or there is a number of equally-important targets (ADAMKIEWICZ-DRWIŁŁO 2010, p. 190–192).

Among the opinions supporting the standard method, A. Thomson distinguished seven criteria of business orientation (ADAMKIEWICZ-DRWIŁŁO 2010, p. 191): satisfying profit, maximizing sales volume, market share (increasing customer satisfaction), survival (associated with development or crisis situation), maximizing business utility for managers, business social responsibility and business growth. A. Thomson states that social responsibility is a crucial element in shaping business behaviour. P. Drucker points out that achieving relevant economic results is an important task, but not the only one. Without positive economic output, an enterprise cannot fulfil its duties to be a good employer, good citizen and good neighbour (ADAMKIEWICZ-DRWIŁŁO 2010, p. 192). The process of identifying business targets is influenced by intellectual capital, which is often the most important resource in terms of its competitive-

ness (NOGA 2009, p. 205). Having considered the above assumptions, the following targets may be distinguished (OBŁÓJ 2007, p. 300):

– Guarantee of safety at work, which is possible when a company is bound to market contracts. This supports quality and innovative activity;

– Assurance of a salary increase under the system, so as to form a clear relation between client satisfaction and level of salary;

– Aiming at relevant level of job satisfaction resulting from a positive impact between the client and employee satisfaction.

O. Williams sought to separate the owner's functions from the manager's functions by introducing a utility function for managers which is slightly different from the owner's function. The basis for creating „managerial utility" are the elements of management process, i.e. prestige, status, authority and salary.

In the concept of business, treated as a union of social groups, coalition functioning is the optimum. In this case, business objectives are an effect of a compromise which can be changed. These groups consist of employees, society, government, managers, shareholders, customers and creditors. (ADAMKIEWICZ-DRWIŁŁO 2010, p. 207). This point of view is similar to the CSR concept and its rule of seeking benefits for all business stakeholders.

This gives room for a CSR consensus. The consensus considers business profit criteria as a crucial tool for meeting other important higher level aims. These include: social acceptance, a satisfactory level of self-fulfilment, business survival and development.

Employee support – research results

Many factors point out that CSR should be accepted by employees, especially knowledge workers. This idea was a starting point in the research carried out in 2010[2]. Respondents of the research were people employed in Poland in different enterprises and organizations. The research was cross-sectional and referred to: executive and senior executive staff, journalists, politicians, doctors, teachers, etc. The result analysis was based on 106 questionnaires. Each questionnaire had 27 questions. The layout of the questionnaire was prepared by J. Kroik and M. Bachorski-Rudnicki. The research was conducted in February and April 2010.

[2] The research was performed by Marek Bachorski-Rudnicki. The work was conducted for the „Forum of Responsible Business", entitled „Realization of the Concept of Responsible Business in a Selected Enterprise" Department of Informatics and Management, Wroclaw University of Technology 2010.

The specific areas of the research were:
– general awareness and knowledge of CSR standards,
– knowledge and use of social responsibility tools,
– ąknowledge of CSR in terms of ethics, ecology, society and law,
– benefits resulting from the status of being a social responsible organization,
– CSR's role in creating a competitive advantage,
– CSR's influence on business reputation.

Knowledge and importance of CSR

The level of general awareness of CSR among respondents was high (estimated at 90%). The estimation was made on the basis of questions regarding the scope of social knowledge at respondents' work. The predominate opinion is that top managers have knowledge of the issue. The other workers' knowledge of CSR is estimated at 30% and their knowledge is considered superficial. Table 1 presents the data.

Table 1

Knowledge of CSR in the analysed organizations

Question: Is the term „Corporate Social Responsibility – CSR known in your organization?	Number of selected organizations	Share in all indications [%]
Yes, the term and its meaning is known to managers.	52	49
Yes, the term and its meaning is known to all workers.	18	17
Yes, the term is known to managers, but its meaning is superficial.	13	13
Yes, the term is known to all workers, but its meaning is superficial.	12	11
No, in my opinion, the term is unknown.	11	10

Source: Adopted from: M. Bachorski-Rudnicki (2010).

Another interesting issue is the number of organizations which have put CSR into practice. The problem was revealed with a question about the organizations' engagement towards the CSR concept. Only a small group of 17 respondents (16%) answered positively, the remaining 89 (84%) stated they had not noticed CSR activities. It must be stressed that this only concerned significant CSR activities. Table 2 shows that there is a difference between an accidental engagement with CSR and a real system of CSR practices. Only 40 respondents observed its implementation (using the rules of CSR system) by their organizations. A major group of respondents were uncertain and the rest did not notice any kind of CSR activity.

Table 2

General opinion about obeying CSR rules by the organizations

Question: Does your organization obey the characteristic rules of CSR?	Number of selected organizations	Share in all indications [%]
Yes	40	38
No	21	20
I don't know	45	45

Source: Adopted from: M. BACHORSKI-RUDNICKI (2010).

Perception of business profit

Another analysed aspect of the research was the estimation of business profit from different perspectives. The results of this are shown in Table 3. There was a possibility to provide alternative answers.

Table 3

Striving for profit as a premise and criteria of business actions

Question: Which concept of profit is used by your organization while striving for profit?	Number of answers for selected criteria	Share in all indications [%]	Share in total number of respondents [%]
Income for development	63	29	59
Income for owners.	77	36	73
Income gained under the laws and regulations.	21	10	20
Striving for income is as important as for skills and social targets.	17	8	16
Income should be gained according to the rules of ethics.	24	11	23
I do not know	12	6	11

Source: Adopted from: M. BACHORSKI-RUDNICKI (2010).

The results suggest that there is a wide spectrum of opinions which stray from the simple „income for owners". Numerous options treat income as an instrument for organization development [63 indications and shares (29%, 59%)]. This option is close to the above statement about the two main criteria for business functioning such as sustainable existence (preservation), survival and development. A small fraction is the balance between striving for income and striving for social targets (17 indications and shares (8%, 16%)). The lack of numerous indications in this case may suggest disbelief in implementing the objectives.

Symptoms of activities for social responsibility

The research indicates that there is a multilevel opinion of the attributes connected with the idea of being a responsible business. The issue was specified by three choice alternative – as provided in Table 4.

Table 4

Main attributes of enterprise activity towards social responsibility

Question: What should be done in order to be a socially responsible organization?	Number of answers for selected criteria	Share in all indications [%]	Share in total number of respondents [%]
Be ethical for stakeholders.	50	18	47
Considering the welfare of: workers, local society, natural environment.	71	25	67
Adequate salary to workers' needs and qualifications.	54	19	51
Protecting the environment.	41	15	39
Protecting workers' health.	34	12	35
Supporting charity organizations.	20	7	19
Others.	0	0	0
I do not know.	9	3	8

Source: Adopted from: M. BACHORSKI-RUDNICKI (2010).

The analysis of the indicated structure shows preferences for activities toward the worker's welfare. Three attributes directly (second, third and fifth) and one indirectly refer to the employee aspect. The alternative that covers three important CSR elements [71 indications and selected shares (25%, 67%)] was highly evaluated. Higher importance pointed out the meaning of salary and health protection. The acquired results correspond with the principles that were discussed in terms of the formula of the ethical code of conduct prepared by the „RP employers" (RASZKOWSKA 2011).

Strategic dimension approach

Strategic elements in CSR were exposed in the research by several questions. One of them tries to describe the reasons for social engagement. Promotion gains a dominant role [68 indications and shares (30%, 64%)], which does not mean departing from the basics of CSR, because business image is a standard element of strategy. The other two elements related to the differentiation context in market competition are significantly distinguished. They are situated on the second [competitive advantage, 38 indications and

selected shares (17%, 36%)] and third place [market success results not only from economics, 36 indications and shares (16%, 34%)]. An enterprise's aiming at reversing the attention from its own troubles and mistakes, which are mentioned by CSR opponents, was also noticed. Although it is insignificant, it is enough to signal the threat. These issues were specified by three choice alternatives – as noted in Table 5.

Table 5

Premises of business engagement in social activities

Question: Does your organization engage in social activities and for what reason?	Number of answers for selected criteria	Share in all indications [%]	Share in total number of respondents [%]
No, there is no reason for engaging in CSR.	4	2	4
Yes, because it is an element of promotion.	68	20	64
Yes, because a company tries to reverse attention from its own mistakes, troubles and breaking labour laws.	24	11	23
Yes, a company is aware that economics is not enough to achieve market success.	36	16	34
Yes, because organizations are sensitive to social problems.	10	4	9
Yes, because there is such a fashion (trend) now.	31	14	29
Yes, because it enables a company to gain a competitive advantage	38	17	36
Yes, but for other reasons.	1	0,5	1
I do not know.	14	6	13

Source: Adopted from: M. Bachorski-Rudnicki (2010).

The CSR concept introduces an area of creating profitable relations with business stakeholders. Generally, the concept concerns everybody who has direct and indirect influence on business functioning. Finding a balanced solution was taken into consideration by both CSR opponents and CSR supporters. In the research, the issue was considered as the indications of the elements of competitive advantage. Among the indicated alternatives, there was a possibility to choose: creating proper relations with all stakeholders [36 indications and shares (15%, 34%)]. It was not pointed out in the first place (Table 6), but it was caused by caution for these activities or by taking into consideration specific stakeholders i.e. workers [35 indications and shares (15%, 33%)]. The highest position achieved was related to clients [45 indications and shares (19%, 42%)].

The problem of social responsibility is multidirectional and needs a balance among the benefits of all business stakeholders. This multidirectional aspect of CSR is often raised by opponents against the practical use of CSR. But in

Table 6

Competition factors realized and discovered by CSR

Question: What factors build business competitive advantage by adopting the CSR concept?	Number of answers for selected criteria	Share in all indications [%]	Share in total number of respondents [%]
Relations with customers.	45	19	42
Relations with business partners.	33	14	31
Relations with employees.	35	15	33
Relations with all stakeholders.	36	15	34
Economic area.	20	8	19
Laws and regulations.	7	3	7
Ethics.	14	6	13
Philanthropy.	6	3	6
Environment protection.	11	5	10
CSR is only a trend used by departments of Public Relations.	10	4	9
No opinion.	14	6	13
I do not know.	7	3	7

Source: Adopted from: M. BACHORSKI-RUDNICKI (2010).

reality, businesses support their stakeholders in an adequate way to market, economic and social situation.

The presented opinions of the respondents suggest that CSR concept may be adopted in order to meet business strategic targets. As confirmed by 50%, CSR use is beneficial in the long run. Some of them underlined only its image character which could not be exploited economically. The topics presented in Table 7.

Table 7

Enterprise's benefits from adopting CSR

Question: Does organization achieve economic benefits by engagement in CSR?	Number of selected organizations	Share in all indications [%]
Yes, in the long term perspective it brings market and economic benefits.	55	52
No, but organization can achieve an image advantage.	26	25
No, there are no economic benefits.	19	18
I do not know.	6	6

Source: Adopted from: M. BACHORSKI-RUDNICKI (2010).

The conducted research pointed out that knowledge workers may accept the implementation of CSR strategy. Some opinions show that employees' disbelief for the effectiveness of CSR concept. It may originate from: lack of personal experiences, multidirectional aspects of CSR and treating CSR as an element of business image.

The perception of CSR by the selected respondents is similar to the expert R. M. Grant's opinion that it is a real context of modern enterprise strategy. The compatibility of empirical research results at the level of strategic motives suggests that enterprises should take into consideration clients' attitudes. They should be treated as „tough players" and it should be visible in business decisions, reports and other documents. The results also pointed out two ways of the integration CSR with strategy; one that attributes CSR to business products or services in a wider business portfolio, and the other – more innovative – incorporates CSR into business model.

In this article the problems of the changes in formulating and implementing CSR strategy are symbolically between two of P. Drucker's opinions. On one hand, the most important target for an enterprise is gaining substantial economic benefits, but on other hand, an enterprise should combine its own interest with the public interest.

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INNOVATIONS IN FOOD PRODUCTION – STATUS AND DIRECTIONS OF DEVELOPMENT

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Key words: innovations, innovativeness, food industry, food.

Abstract

This paper characterises the directions of innovative activities undertaken by food industry enterprises concerning the manufacturing of food products. Based on the subject literature and secondary statistical data, the status of food industry innovativeness and areas of innovative activities related to implementation of technological and non-technological innovations are presented. The activities of enterprises focus on manufacturing new products in response to the ever-changing needs and expectations of consumers. In particular, the production of so-called functional food (which seeks to promote health, minimise the risk of specific diseases, improve psychophysical fitness, lose weight, etc.) is increasingly extensive. Manufacturers must also improve the technologies and techniques of product manufacturing, packaging and storage.

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Słowa kluczowe: innowacje, innowacyjność, przemysł spożywczy, żywność.

Abstrakt

W opracowaniu scharakteryzowano kierunki działań innowacyjnych podejmowanych przez przedsiębiorstwa przemysłu spożywczego, dotyczących produkcji artykułów żywnościowych. Bazując na literaturze przedmiotu oraz wtórnych danych statystycznych, przedstawiono stan innowacyjności branży spożywczej oraz obszary innowacyjnych działań związane z wdrażaniem innowacji technologicznych i nietechnologicznych. Działania przedsiębiorstw koncentrują się na wytwarzaniu nowych produktów, które są odpowiedzią na zmieniające się potrzeby i oczekiwania nabywców. Coraz bogatsza jest zwłaszcza oferta tzw. żywności funkcjonalnej, która ma wspomagać prawidłowe funkcjonowanie organizmu, minimalizować ryzyko wystąpienia określonych chorób, poprawiać sprawność psychofizyczną, zwiększać wydolność itp. Oprócz tego producenci żywności doskonalą techniki i technologie wytwarzania, pakowania i przechowywania produktów.

Introduction

The development of enterprises, regions or countries is determined by many phenomena and factors whose nature, intensity and scale of influence are so diversified that formulation of a "simple prescription" to achieve them is impossible. Understanding the mechanisms governing these phenomena has been the subject of interest of numerous researchers. By focusing attention on different aspects of economic activity, they formulate the concepts explaining the causes, outcomes and conditions of those processes. Innovations that appeared for the first time in the theory of economic sciences thanks to Schumpeter (1960) are among them. Schumpeter focused mainly on technological innovations and their influence on the economy, highlighting their supply-driven sources (the so-called "supply-based" theory of innovation). He specified that innovations form the basis for changes and are the main economic development driving force. Contemporary theories, particularly those developed in recent years, stress the role of knowledge as a factor linked closely to innovation, which together contribute to economic development. That position is characteristic for, among others, FLORIDA (2010) – the author of such notions as the creative class, the creativity-based economy and the learning region.

Currently, knowledge and innovations form the basis of sustainable development, which is confirmed by the development trends of highly-developed countries (ŁAPINSKI 2010). Enterprises implement innovative solutions in production (of goods and services), technology, administration and marketing techniques. They represent a reaction to market challenges and, as a consequence, become a key factor in modern and dynamic organisations. Innovativeness as a characteristic or image of innovative entities, is frequently, and not without reason, linked to a competitive advantage because it is the outcome of activities seeking to improve market position in relation to competitors. For this reason, it is one of the major sources for obtaining an advantage over them. If this is combined with the current trends of integration and the globalising economy, then innovation implementation proves to be not only necessary, but also inevitable.

This paper focuses on the innovative activities of food industry enterprises narrowing their activities to adjust to current trends in food product manufacturing. Based on the subject literature and the secondary statistical data, the food industry innovation status and areas of innovative activities related to technological and non-technological innovation implementation are presented. This presentation is preceded by a short description of Polish economic innovativeness and its relations to traditional industrial sectors, including the food industry.

Innovativeness of the Polish economy

In Poland, despite some fluctuations, economic growth has been observed which has resulted in acceleration of the GDP growth rate, among others (*Polska 2011. Raport o stanie*... 2011). The sources of growth used so far, such as access to cheap and qualified labour and raw materials, however, are nearing exhaustion. As highlighted by GULDA (2008), this is manifested in several ways, e.g. increasing costs of labour acquisition. For this reason, it will be increasingly difficult for enterprises to continue competing on the basis of those factors and over time it will actually become impossible. Under those circumstances, the search for, and use of, other sources of competitive advantage represent a chance for continual and dynamic development. Innovation is particularly important among these sources. Increasing innovativeness, next to effectiveness maximisation and resource (knowledge, capital, labour, raw materials and natural resources) optimisation, represents a fundamental assumption for one of the latest strategic documents for attainment of the medium- and long-term development strategy of Poland – *The Strategy of Innovation and Effectiveness of the Economy for the years 2012–2020* (*Strategia*... 2012).

The Polish economy is characterised by a low innovation level. As indicated by the Innovation Union Scoreboard (IUS) report published in February 2012, a large gap exists between Poland and many other EU countries (Sweden, Denmark, Germany and Finland) (*Innovation*... 2012), and from outside the EU (Switzerland, Japan and the United States are the leaders in that ranking). The *Summary Innovation Index* – SII achieved by Poland in 2011 (roughly 0.3) was almost two times lower than the EU-27 average and more than 2.5 times lower than that for Sweden. Clear identification of the reasons for that situation is not possible. They are numerous, highly diversified and their character, at least in the case of some of them, is either immeasurable or is difficult to measure, diagnose or define. They are consequences of historical or cultural complexities, for example, for which a low level of public confidence and unwillingness to cooperate may be a factor. At the same time, as highlighted by KLEIBER (2011), public openness to the world is required for innovative economic development under conditions of progressive globalisation. Additionally, CRAFTS (2000) showed that countries representing a higher level of openness have better long-term development potential and this is a factor supportive of innovative activity. In addition to contempt for joint- and organised-cooperation (e.g. science and economics), the other most often highlighted weaknesses of Polish innovativeness include a low diversification of information sources on innovative activities, low outlays on innovation and research, the absence of an innovation-oriented policy, particularly including

a lack of activities integrating the innovative activities of different entities, organisations, institutions and authorities.

Decreasing the distance and improving the position of Poland in the international innovation rankings is possible, but it will be a long-term process. It is estimated that with the current trends, Poland will reach the average level of EU countries in 50 years (*EIS 2005*). Assuming certain "prudential optimism", it can be assumed that the process of "catching up" has been initiated. In the general classification of countries presented in the IUS Report[1], Poland was classified in the third group – the so-called *moderate innovators* and, although it was ranked the last in that category, the result was better than in, e.g. 2005, 2007 or 2008. In those earlier cases, it was included in the last category of countries that at that time were called countries "*losing ground*" (*EIS* 2005). Although it is difficult to formulate any radical conclusions based on this, considering the long-term trend of systematic closing the gap, the situation may indicate, at least, the appearance of certain symptoms and Poland joining the development stream in which innovations represent a key factor. It should be added, as pointed out by ROGUT and PIASECKI (2011), that the promotion of Poland to the category of moderate innovator did not result from increased research intensity or faster commercialisation of their results but was mainly the consequence of development in traditional sectors, including primarily the improvement of labour qualifications as well as the technological and technical competences. Those sectors are among the more important areas of Polish industrial economic activity. In 2009, entities representing low technology (those are generally referred to as "traditional") represented 50% of the domestic manufacturing industry entities, employing 47% of the working population and generating 35% of production sold in that section (*Nauka*... 2011). The food industry plays an important role among them.

Food industry in Poland

In 2009, food processing enterprises represented almost 20% of the total number of enterprises in Poland (according to the number of entities conducting business during the year). They employed ca. 15% of the total working population and their sales represented 16% of the total value of production sold. If the data for the food industry is compared to industrial enterprises only (section: industrial processing), then the indicators are even higher (total

[1] Based on the summary innovation index (SII) and the rate of changes in it, the countries were classified by dividing them into four groups: innovation leaders, innovation followers, moderate innovators and catching-up countries (*Innovation*... 2012).

number of enterprises – 21%, average employment – 17% and production sold value – 19% respectively). (*Rocznik Statystyczny*... 2010). This industry, however, is characterised by large dispersion (Fig. 1). Almost 70% of the entities are micro-enterprises and, together with small enterprises, this percentage increases to 90%. The scale of their production is small, which is indicated by the structure of employment and sales. A much larger role is played by medium and large enterprises. This structure (particularly for production sold) was undoubtedly influenced by the processes of consolidation observed within individual segments of the industry, which WIGIER (2011) considers inevitable. The meat industry (10 largest representatives of that segment generate ca. 1/3 of the domestic production) and the dairy industry (5 largest producers control 30% of the milk market and its products – DROŻDŻ 2009) are the best examples.

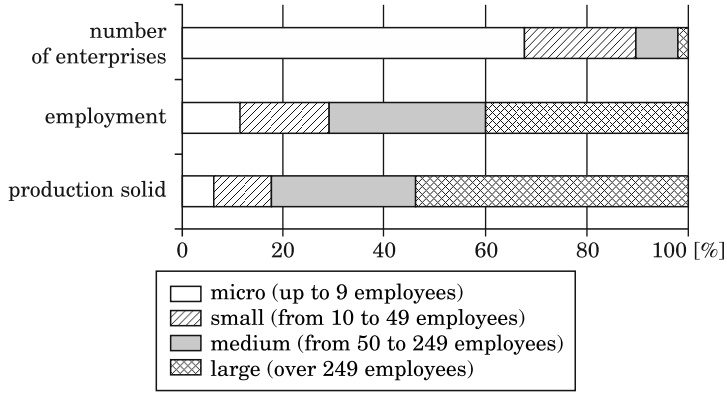

Fig. 1. Structure of food industry entities in Poland in 2009
Source: own work based on the *Industry by Employment Size Classes*. http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home (access on 12 March 2012).

Currently, the food industry is one of the most dynamically-developing sectors of the Polish economy. Modernisation processes induced by the necessity of business adjustment for operating under market conditions, as well as the accession of Poland to the European Union, have also resulted in a significant improvement of the technical status and upgrading of the production equipment. As a consequence, this helped firms to achieve standards that made them eligible for trading in the common market. Export sales of agricultural food products increased thanks to which the producers improved their competitive position in the market of the expanded European Union. During the initial 5 years of membership, the share of exports in the total food industry sales increased by ca. 22% (i.e. it was more than 2-times larger than prior to the accession of Poland to the European Union – SZCZEPANIAK, DROŻDŻ 2010).

The dynamics of food product exports by the domestic processing industry means that those products are accepted by foreign consumers and also indicates the ability to compete with other producers. The direct cause of this success, however, was the lower labour costs (lower than in the EU-15) and, as a consequence, lower prices and costs of food production. Those advantages are now steadily decreasing. Prior to the accession of Poland to the EU, the retail prices of food in Poland were lower than in the "old" Union by ca. 40% but during the years 2008–2009 they were lower by only 28% (URBAN 2010). This situation is also applicable to prices at the level of processing and agricultural prices. For food producers, this means the necessity of applying non-price competition instruments to a wider extent than previously and innovations are particularly important among them. The use of innovative solutions is necessary for the production of a new generation of high quality products. The intensity and scale of implementation will determine the potential for maintaining market share in both the foreign and domestic food markets. However, as indicated by the data provided by the Central Statistical Office (GUS), the innovative activity of this sector is relatively low (*Działalność innowacyjna*... 2012). During the years 2008–2010, only 12% of the total number of food enterprises in Poland introduced product and/or process innovations, while fewer than 17% introduced organisational and/or marketing innovations (for comparison, those percentages in the manufacturing industry were 17% and 21% of enterprises, respectively). In their activities, the enterprises focused mainly on expanding the range of products and improving the quality of their products. They generated less than 5% of total sales from sales of product innovations (in the manufacturing industry, that value was almost 3-times higher). The barriers to undertaking innovative activities resulted, similar to the entire industrial sector, from the economic conditions (excessively high innovation costs and lack of funds for implementation) although competing companies increasing market share was a serious concern for almost 25% of enterprises.

Innovations in the food industry

The specificity of the products offered by food industry enterprises is that they satisfy the fundamental nutritional needs and are directly related to human health and life. For these reasons, the offers presented by producers are influenced by various trends in the food market, particularly those in the field of consumption. They are shaped under the influence of consumer behaviour patterns which, despite differences between individual countries, are becoming increasingly homogenous. Their increasing similarity is sup-

ported by the development of the cheap international trade networks, unification of the offer of the commercial centres, development of fast food-type restaurant networks, media, the development of tourism supportive to the exchange of consumption patterns between the tourists and the local population and processes of departing from the traditional consumption patterns (KWASEK 2010). Specific behaviours result from the tastes and preferences (i.e. lifestyle) on the one hand, while on the other they are also a consequence of phenomena (including risks) related to civilizational development. DOWNEY (2005) includes, *inter alia*, safety (consumers expect food that is safe and fear the appearance of pathogenic factors, such as BSE or AH1N1), health, welfare and affluence (factors particularly important in the context of consumer needs, lifestyle and income as well as diseases caused by poor nutrition) and the ageing of society (consumers want innovative products with a high content of nutritive components, which combined with a healthy lifestyle and principles of "healthy ageing", should improve the quality and length of life) among the key factors causing changes in the food market. Food industry enterprises also consider, or at least should consider, such factors in designing the appropriate product range offer. This involves the vast majority of products which represent modifications to existing solutions. Such proposals are accepted by consumers more readily; they expect novelties, on the one hand, while, on the other, they generally choose products they already know (FREWER et al. 2005).

The trends in food production which form the basis for innovative actions by food industry enterprises also include both fresh and processed food. Fresh products offered in their natural form (or minimally-processed) are perceived as being better, healthier and containing more valuable nutritive components than those that were produced using long and complex technical processes. Minimally-processed food is considered to be a major advantage of Polish production and the image of Poland as a producer of healthy and organic food is popular (KOZIOŁKIEWICZ et al. 2011). Activities of enterprises are focused on the possibilities of retaining that freshness for as long as possible. As a consequence, innovative solutions in this area mainly involve the techniques and technologies of preservation, assuring appropriate storage conditions and transport techniques. Organic food (interpreted as representing natural products, high quality and health safety) fits well with this trend in consumer expectations and requirements. The production of such products is conducted by employing methods that do not disturb the natural environment and the products do not contain preservatives or residues of pesticides. The producers of such foods base their production on natural components and protection methods and often use biodegradable materials.

Packaging plays an important role in food production. As indicated by domestic statistics, enterprises producing food products most often apply

changes related to packaging. This is the most common of all marketing innovations, and differentiates such products from industrial processing, which relies on new methods of pricing or new product media promotion or techniques (*Działalność innowacyjna*... 2012). The package, in addition to its protective or informative function, influences the product use, convenience and safety, facilitates storage and attracts consumer attention with its shape, colours, aesthetics, etc. Extending the freshness period of the product, while maintaining its looks, taste and nutritive components is also among its tasks. Additionally, the increasing pace of social development and changes in consumer lifestyles, particularly for professionally active people, cause consumers to seek products in the form of ready dishes, concentrates or semi-finished products that are suitable for direct consumption or products that are relatively quick and easy to prepare for consumption. This is also linked to packages that may shorten the meal preparation time (e.g. a frozen dinner dish that may be prepared in a microwave oven without taking the packaging off). The new trends in this area of innovative business activities also include the so-called "active" packages (that change the environmental conditions of the food packed in order to guarantee its safety, quality and extended shelf life, for example) or intelligent packages (which monitor the conditions in which the packed food is set – PANFIL-KUNCEWICZ et al. 2011). In addition to innovative packages, food product packaging techniques and technologies are also developing dynamically. Various solutions (e.g. aseptic, vacuum or modified atmosphere packaging) have already been implemented, but they are still being developed (e.g. by substituting high temperatures with bacteria filters). At the same time, the common application of nanotechnologies for the production of innovative food packages is just a matter of time (KOZIOŁKIEWICZ et al. 2011).

The increased awareness of the consumers concerning health problems induced by inappropriate nutrition have caused producers to start seeing their products from beyond their basic function of nutrition. Their influence on the health status, welfare or decreasing the risk of diseases is also proving to be important. This is the key characteristic of the so-called functional food. The components that could have a negative influence on health (e.g. allergens) have been removed or have been enriched with physiologically-active substances to obtain products possessing health- and fitness-promoting features (*Żywność i żywienie*... 2010). This includes, *inter alia*, food containing live bacterial cultures (e.g. dairy products), foods with decreased contents of sugar, fat (e.g. "light" products), enriched with vitamins, minerals or cellulose (e.g. juices, breakfast flakes, products made of cereal seeds, deserts), omega-6 and omega-3 fatty acids (e.g. margarines, oils, food concentrates), etc. Given the character of their components, such products are frequently sensitive to the influence of external factors, so, in their case, appropriate packaging and storage condi-

tions are also important. The task of functional food, in addition to nutrition, is its physiological influence, which may help, for example, to decrease the level of so-called "bad" cholesterol, restore the microbiological balance of the digestive system, support anti-carcinogenic activity or boost the immune system (TUORILA 2001). Consequently, it limits and/or prevents the appearance of many civilisation diseases (e.g. diabetes, obesity, cardio-vascular system diseases). It is believed that, in the future, the treatment and prevention of such diseases will be carried out mainly on the basis of a comprehensive and individually-prescribed diet based on new functional additives to food (KOZIOŁKIEWICZ et al. 2011). Additionally, innovative food products also include products designed according to the specific needs of the body. Such products are targeted to a specific group of consumers, e.g. people with diabetes, food intolerance, cardio-vascular diseases as well as athletes, people under stress, pregnant women, infants, children or the elderly.

It is not possible to list all the segments of functional food. In addition to health-promoting characteristics, such food may also influence a consumer's self-perception or appearance. KRYGIER (2012), quoting J. Mellentin, the editor-in-chief of the "New Nutrition Business" magazine presents the opinion that, in the near future, the trends observed in the global functional food markets will also be present in Poland. In addition to products containing pro- and pre-biotics and antioxidants, natural health food, health snacks or food for children, he also lists beauty food, mood food, food with a "premium" (premium-isation, otherwise known as BFY – Better for You food) and weight-management food. The wide diversification of products of this type, on the one hand, shows the vast diversification of functional food and, on the other, the increasing interest of the consumers in such products, which has led to this becoming one of the fastest developing global food market segments. At the same time, according to KOZIOŁKIEWICZ et al. (2011), production of functional food focused on health characteristics may contribute to the Polish food industry achieving global-scale success. Such opportunities are also offered by new technologies – particularly nano-encapsulation and nano-emulgation of selected health components of food, assuring their durability and allowing precise delivery of them to the body as well as helping to evaluate their influence on the human body.

Conclusion

Producers of food products developing innovative solutions must meet the changing needs and expectations of the buyers with scientific and technological achievements in that particular type of production. Not all of them are fully

accepted and sometimes the level of acceptance is marginal (e.g. transgenic food). The current range of products is constantly being modified. The presented directions of innovative activities conducted by food industry enterprises do not exhaust the subject of innovative solutions employed in this industry. It may be generally concluded that they represent a response to the observed trends in food consumption. They also result from the increasing consumer awareness concerning the quality of living and its correlation with nutrition methods. That is why there has been such great (and continually increasing) interest in functional food observed, particularly for foods with health-supporting characteristics. Such foods may contribute significantly to preventing numerous civilizational diseases and may even represent the most effective way of preventing them. Food industry enterprises in Poland must adjust their offered range of products to these needs and expectations, especially because it offers them a chance for sustainable development and effective competition against foreign producers.

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INNOVATIVE POTENTIAL AND ACTIVITY OF THE SME-SECTOR IN THE PROVINCE OF WARMIA AND MAZURY

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K e y w o r d s: innovations, innovativeness, SME-sector.

A b s t r a c t

SME-sector enterprises seeking to be more competitive in the domestic and foreign markets should build their competitive advantage on the basis of innovativeness. Analysis and assessment of innovative potential translates into activity (or its absence) in the field of innovation. This is important for determination of business innovativeness and represents a component of business competitiveness. This paper studied the innovativeness of SME-sector enterprises in the region of Warmia and Mazury. The results showed that as many as 62.3% of the surveyed SME-sector enterprises were innovative and that they implemented product innovations the most frequently (31.7% of all innovations). Nevertheless, the majority of innovations were local in nature and the opinions expressed by customers proved to be the most important external source of innovations, while the enterprise owner was the main source of internal innovations.

POTENCJAŁ I AKTYWNOŚĆ INNOWACYJNA SEKTORA MSP W WOJEWÓDZTWIE WARMIŃSKO-MAZURSKIM

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S ł o w a k l u c z o w e: innowacje, innowacyjność, sektor MSP.

A b s t r a k t

Przedsiębiorstwa sektora MSP, chcąc być bardziej konkurencyjnymi na krajowym i zagranicznym rynku, powinny budować swoją przewagę na innowacyjności. Analiza i ocena potencjału innowacyjnego, który przekłada się na aktywność (lub jej brak) w zakresie innowacji, jest znacząca do określenia innowacyjności podmiotów gospodarczych oraz jest składową konkurencyjności przedsiębiorstwa. W opracowaniu przedstawiono wyniki badań nad innowacyjnością sektora MSP

w regionie Warmii i Mazur. Wyniki badań wykazały, że aż 62,3% badanych przedsiębiorstw sektora MSP było innowacyjnych i najczęściej wdrażały innowacje produktowe (31,7% wszystkich nowości). Większość innowacji miało jednak charakter lokalny, najważniejszym zewnętrznym źródłem informacji o innowacjach okazały się opinie wyrażane przez klientów, wewnętrznym zaś – właściciel przedsiębiorstwa.

Introduction

The issues of innovation have been, and still are, the key component in considerations related to European Union development. This is evidenced by the communique of March 2010 – *A Strategy for Smart, Sustainable and Inclusive Growth*. It highlights that a knowledge- and innovation-based economy is one of its key priorities. In analysing the strategy of economic development of Poland until 2012, it can be concluded that the current sources of competitiveness advantages including, among others, the relatively low labour costs and availability of cheap raw materials, will be nearing exhaustion. Consequently, the search for new sources of competitive advantage (e.g. innovations) is recommended because, as indicated by the experience of highly developed countries, only those factors can guarantee sustainable economic growth.

Innovation, as one of the pillars for building a competitive advantage, represents a fundamental factor of business success in a free-market economy environment. This is highlighted by BACHNIK (2006, p. 33), who claims that, together with globalisation, internationalisation and the opportunities of expansion into foreign markets as well as increasing pressure from competitors, the innovativeness of a company becomes a source of its competitive advantage. Within the framework of fierce competition, innovation becomes necessary to achieve market success. BACHNIK (2006, p. 33) agrees with that and points out that only innovative activity conducted systematically may secure a lasting competitive advantage. SIEROTOWICZ (2007, pp. 78–89) also supports this thesis and notes that technological progress and development in science and knowledge result in the increasing complexity of products and current innovations. This is possible only when a company conducts innovative activities with a scientific (research), technical, administrative, financial, trade and commercial nature (*The OECD Bologna Ministerial Conference*... 2001). The innovativeness of a business is defined as the skill of implementing new ideas and research results in practice, intended to lead to the improved competitive position of the company (*Innowacje w firmie*... 2012). The above considerations have inspired empirical studies concerning the innovativeness of small and medium enterprises (SME) functioning within the province of Warmia and Mazury aimed at assessment of the innovative potential and activity of the SME-sector.

Methodology of studies

This paper presents a comparative analysis of own studies with those obtained by JUCHNIEWICZ et al. (2009) and PLAWGO and KORNECKI (2010) concerning the SME-sector innovativeness in Warmia and Mazury compared to the rest of the country. This allowed an analysis to be made of the cause-and-effect relations involved and to determine the influence of the different factors studied.

Own studies were conducted in 2009 encompassing 124 SME-sector enterprises in Warmia and Mazury within the framework of the project "*The role of women in innovative enterprises based on the example of entities from Warmia and Mazury*"[1]. The entities for the survey were identified during a stratified draw (where the individual strata represented sub-regions of Warmia and Mazury, i.e. Olsztyn, Elbląg and Ełk sub-regions), and the next 400 entities were drawn at random from each sub-region. Responses were obtained from 163 entities, of which 76% could be classified as innovative entities functioning in the SME-sector.

For this study, the individual categories of entities were identified using the definitions supplied by PKPP Lewiatan (STARCZEWSKA-KRZYSZTOSZEK 2006, p. 5). The criterion of employment was assumed for classification of participants into one of two groups, which indicated that small enterprises represented the majority of the population surveyed (68%), while the remaining participants were entities with employment of 50–249 persons. An innovative enterprise was defined as an enterprise that implemented at least one product, process, marketing or organisational innovation during the years 2006–2008 (*Zasady gromadzenia i interpretacji*... 2008, p. 19). It should also be noted that, as a consequence of the small survey population, the data collected is insufficient and may not form the basis for formulation of general conclusions, although it can be a certain point of reference for more studies of this issue.

Innovative potential of the SME-sector

Meeting the challenges of contemporary economic processes requires businesses to increase activities to enhance their ability to compete. This can only be achieved through the innovative potential available to those entities. Spending on innovative activities represents one group of innovative potential indicators. They define the capacity for creating and commercialisation of new

[1] The project was implemented by the Warmia and Mazury Agency for Regional Development S.A. in Olsztyn within the frameworks of the Integrated Regional Development Operational Programme 2004–2006, (Priority II – Strengthening the development of human capital in the region, Measure 6: Regional Innovation Strategies and knowledge transfer).

ideas and, as a consequence, reflect the ability of the businesses to innovate. Both positive and negative symptoms can be noted (Tab. 1) in analysing the dynamics of spending on innovative activities of SME-sector enterprises in Warmia and Mazury.

Table 1

Level and dynamics of spending on innovative activities during the years 2004–2008

Item	Poland		Warmia and Mazury		Dynamics (2004 =100%)	
	2004	2008	2004	2008	Poland	Warmia and Mazury
Spending on innovative activities						
Total (PLN million)	15,628.10	25 367.00	210.20	325.40	162.80	154.80
As % of the GDP	1.69	1.99	0.78	0.92	117.50	117.31
Per 1 enterprise conducting innovative activities (in PLN thousand)	4,928.70	4,614.7	1,625.70	1,848.80	93.63	113.72

Source: own work based on the data of the BDL and *Powierzchnia i ludność...* 2005, table 02; *Powierzchnia i ludność w...* 2008, p. 19; *Produkt krajowy brutto...* 2006, p. 48; *Produkt krajowy brutto...* 2010, p. 58; *Nauka i...* 2005, p. 81; *Nauka i...* 2010, p. 171.

The total value of spending on innovative activities by SME-sector enterprises increased in 2008 by over half (55 p.p.) as compared to 2004, while in Poland the increase was slightly higher at 63 p.p. On the other hand, for spending on innovative activities in relation to GDP, the rate of change in Poland was similar (the national level was 117.5% while for the province of Warmia and Mazury it was 117.3%). It should be added that JUCHNIEWICZ et al. (2009, p. 74), found a directly proportional correlation between the GDP level and spending on innovative activities. Increased GDP was correlated with higher spending on innovation for enterprises from a given province. The increasing trend in spending on innovation by innovative enterprises should be considered to be a positive phenomenon. In Warmia and Mazury, firms allocated almost 14 p.p. more spending for innovation in 2008 than in 2004. In Poland, an opposite trend was observed – the level of spending decreased by almost 6 p.p. The domination of low-tech industries in the region (70% of total spending on innovation) could be the reason for the low expenditures on innovation activities in Warmia and Mazury. This directly influences the clearly lower level of innovativeness in the businesses from Warmia and Mazury (JUCHNIEWICZ et al. 2009, p. 77).

The sources of financing of innovative activities (similar to expenditures) indicates that innovative capacity is an important determinant of innovative activities. Nationally, and in Warmia and Mazury, the clear domination of own

funds can be noticed. In 2009, entrepreneurs in Poland and in the SME-sector indicated the use of own funds in 68.4% and 81.2% of responses while in 2007 in the region they represented 81.9% of such funds (Tab. 2, the data for 2009 for the province of Warmia and Mazury are not available due to confidentiality requirements).

Table 2

Structure of spending on innovative activities according to the source of funding

Item	2009		2007*
	Poland (total)	SME	Warmia and Mazury
	[%]		
Own funds	68.4	81.2	81.9
Bank loans	25.7	16.1	15.6
Funds obtained from abroad	3.2	2.1	1.2
Budget funds	1.1	0.2	1.2

Source: own work based on *Nauka i technika...* 2009, *Nauka i technika...* 2011.
* for 2009 the data for the province is not available as a consequence of maintaining statistical confidentiality according to the Act on Public Statistics.

Additionally, in 2009, Polish entrepreneurs were quite willing to contract bank loans for innovative activities (25.7%). The situation was slightly different for the SME-sector where only 16.1% of the respondents employed own funding for innovation. Bank loans enjoyed similar popularity in Warmia and Mazury (15.6%). The share of funds obtained from abroad and the national government contributed to the development of innovation in the SME-sector in the country and in the province only slightly.

The sources of inspiration both within an enterprise and from its environment represent another factor initiating innovative activities. Opinions expressed by the clients proved to be the most important external source of inspiration for innovative activities in the surveyed units from the SME-sector (4.13 points), while the business owner was the main internal source of such inspiration (3.95 points – Tab. 3). The results of own studies were highly consistent with those obtained by PLAWGO and KORNECKI (2010, p. 123), where client opinions scored 6.73 points on a ten-point scale. This is also confirmed by the results of studies conducted by JUCHNIEWICZ and GRZYBOWSKA (2010, p. 118) of the innovativeness of micro-enterprises, which found that owners and clients were the most important sources of information used in innovative activities.

Table 3

Sources of information on innovation in SME-sector enterprises

Item	Source type	SME-sector	
		Own survey 2009	Survey by Plawgo and Kornecki 2010
Internal	owner	3.95	bd
	ideas from the research and development unit employees	3.78	bd
	company management	3.71	bd
	ideas of other enterprise employees	3.22	5.74
External	opinions from clients	4.13	6.73
	cooperation with other enterprises	3.23	5.58
	cooperation with research and development units	2.84	bd
	copying of competitor solutions	2.45	bd

Source: own work based on own surveys and those by; Plawgo, Kornecki (2010, p. 123).
* The evaluation was conducted using a 1–5 scale where 1 was a source without importance and 5 was the most important source. bd means no data available. The data represent the arithmetic averages of the ratings.

Ideas of the R&D-unit employees were the second-most important source of inspiration for innovative activities (3.78) while the company management scored lower (3.71). It is worth adding that our own studies found cooperation with other market entities was the second-most important external source of innovation ideas (3.23). Similar results were obtained by Plawgo and Kornecki (2010). In their studies, the above factor scored 5.58. The respondents did not highly assess cooperation with R&D units (2.84) or the solutions employed by competitors (2.45).

Innovative activity of the SME-sector

Innovative activity is correlated with the ability of an enterprise to implement innovative products and solutions. Mizgajska and Wściubiak (2005, p. 4) consider the set of activities inside and outside the enterprise aimed at producing or obtaining innovation, i.e. new products, processes, markets and organisational methods, as representing innovative activities.

In Poland, the SME-sector innovation level is relatively low; innovative activity has been, and still is, at a low level. According to the subject literature (Świadek 2005, p. 34), the major inhibitions include, among others, economic risk, loan interest rates, investment costs, lack of qualified personnel, legal

regulations and lack of reaction to new products by clients. Identification of these factors allows a systemic, logical and well-considered understanding the mechanisms inhibiting innovation and steps to be taken to minimise their influence. This was visible in the higher innovative activity among the medium enterprises. In 2009, the data on innovation in the SME-sector in Warmia and Mazury and in Poland showed that only 10.9% of the small businesses in the region and 12.5% of small Polish enterprises implemented innovations (Tab. 4). Our own studies showed that more than half of small businesses (55.3%) took an active part in innovative activities.

Table 4

Structure of the SME-sector enterprises implementing innovations in 2009 by type

Item		Innovative enterprises		New or significantly improved products		New or significantly improved processes	
		small	medium	small	medium	small	medium
		[%]					
BDL 2010	Warmia and Mazury	10.9	26.5	7.2	21.9	7.9	22.7
	Poland	12.5	30.1	8.7	18.8	9.5	20.1
Own studies	Warmia and Mazury	55.3	77.3	28.3	36.1	19.6	33.3
	Poland	62.3		31.7		25.6	

Source: own work based on: own studies, CSO, Local Data Bank (no data on organisational and marketing innovations), Warsaw 2010.

Despite the relatively low share of innovative businesses in the total number of entities, this situation compares favourably against the average data for Poland (10.9%, 6th place among all provinces). For the implementation of new or significantly improved products, small enterprises also compared favourably at 8.7% (the province was ranked 5th in the country) compared to the national average of 7.2%. A similar ranking of the province compared to the rest of the country was observed for process innovations.

Unfortunately, in 2009 the share of medium enterprises from Warmia and Mazury looked much worse compared to the country as a whole. The share of innovative enterprises employing from 50 to 249 people in the total number of businesses was 26.5% (last place in Poland) while the national average was 30.1% for such entities.

For process and product innovation implementation by medium enterprises, the region of Warmia and Mazury compared to Poland looked even worse (14th place among all provinces). Medium enterprises implementing new or significantly improved products represented only 18.8% of the innovative enterprises of this type (3.1 p.p. less than the national average). Process innovations were only implemented by every fifth medium-sized business in the province (20.14% – 2.6 p.p. less than the national average).

Comparing the data from the Local Data Bank (BDL) with own studies, it can be seen that both product and process innovations were the domain of the medium-sized enterprises. As many as 77.3% of medium enterprises were innovative. Those partial shares of innovative enterprises influence the results of the SME-sector as a whole. As indicated by the conducted studies, the majority (62.3%) of small- and medium-sized businesses from Warmia and Mazury were involved in innovation implementation, but only every third enterprise (31.7%) implemented a new or improved product. This can be explained by the specificity of the region. According to the CSO data, 75% of enterprises registered in Warmia and Mazury in 2010 were services. It can be assumed that the entities surveyed focused on the implementation of new or improved services. The domination of product innovations in the total number of novelties might occur as a consequence of the fact that, compared to other innovations, they are characterised by a relatively low complexity of implementation. They do not require (as is the case with some administrative innovations) changes at all levels of management. The resistance to change – a frequently mentioned factor inhibiting innovativeness – is of low importance in the case of product innovations.

Process innovations were less-frequently implemented in the SME-sector (25.6%). It should be added that product and process innovations are complementary because not every product or service can be produced using existing machinery or employing an obsolete production line.

According to the subject literature (*Zasady gromadzenia i interpretacji*... 2008, pp. 60–61), a new or improved product or marketing solution, although known only in the domestic or local market, can also be considered an innovation. For this reason, innovations were also grouped at the so-called novelty level for this empirical study. The results of studies by ZIĘBA and OSTER (2011) on predictions concerning the scope of innovation, indicated that among the entrepreneurs from the SME-sector there is high belief in the implementation of innovations that will be novelties only within the enterprise (50%). At the same time, every fourth entrepreneur believed that, in the future, the implemented innovations would be novelties on a local scale, while roughly every fifth entrepreneur would implement the novelty on a national scale. The above-presented studies, however, did not fully correspond with our own studies.

Our own studies found that the largest proportion of enterprises had implemented a local-scale (county) innovation (39.1%) and those were small businesses (Tab. 5). Fewer small enterprises implemented innovations that were novelties for themselves only (29.8%), while every fifth enterprise was involved in an activity that was innovative on the regional scale (22.6%). The results presented are similar to those for the entire SME-sector.

Table 5
Novelty scale of different innovation types implemented by the SME-sector in the province of Warmia and Mazury

Item	Novelty in					
	company scale only	local scale (county)	regional scale (province)	national scale	European scale	global scale
	[%]					
Enterprises small	29.8	39.3	22.6	6.0	1.2	1.2
Enterprises medium	15.2	20.3	29.1	24.1	7.6	3.8
SME-sector	22.7	30.1	25.8	14.7	4.3	2.5

Source: own work based on studies.

Medium-sized enterprises were involved mainly in activities innovative on the regional (29.1%) and national (24.1%) scales while to a lesser extent on the county scale (20.3%). Significantly fewer entities implemented innovative projects that were novelties just on a company-scale (15.2%). A small percentage of the SME-sector companies were implementing European- or global-scale innovations. This can be explained by the fact that creating a national scale innovation requires major expenditures on research and development that the SME-sector enterprises are unwilling to cover (only 10% of the total amount of the declared funds for innovations) (ZIĘBA, OSTER 2011).

The results showed that the innovative activities of small entities were focused mainly on local and, less frequently, on regional markets. This is confirmed by the number of novelties introduced to the market in all types of innovations (from 45% of product innovations and 44.4% of administrative innovations, through 36.8% of marketing innovations to 33.3% of process innovations – Tab. 6). It was noted that only in the case of marketing innovations did small enterprises implement a similar number of innovations on a local (33.3%) and regional (29.6%) scale.

For medium enterprises, the level of novelty of innovations implemented was local, regional and sometimes national in character. Medium-sized entities implemented the largest proportion of administrative innovations (47.1%) at the province scale and product innovations at the county and national scale (31%) and on the regional scale (24%) as well as national-scale process innovations (31%) and on a regional scale (24.1%). The marketing innovations were the fewest and they were mainly county or regional scale novelties (26.7%).

Innovative activity is nowadays a must for the business competitiveness and those that implement such activities achieve quantifiable returns in the form of higher net revenues from products sold than competitors. According to

Table 6

Novelty scale of different innovation types implemented by the SME-sector

Item	Novelty in					
	company scale only	local scale (county)	regional scale (province)	national scale	European scale	global scale
	[%]					
Product innovations, including:						
Enterprises small	25.0	45.0	30.0	0.0	0.0	0.0
Enterprises medium	6.9	31.0	24.1	31.0	3.4	3.4
Process innovations, including:						
Enterprises small	31.6	36.8	15.8	10.5	5.3	0.0
Enterprises medium	6.9	17.2	24.1	31.0	13.8	6.9
Organisational innovations, including:						
Enterprises small	38.9	44.4	11.1	5.6	0.0	0.0
Enterprises medium	29.4	23.5	47.1	0.0	0.0	0.0
Marketing innovations, including:						
Enterprises small	25.9	33.3	29.6	7.4	0.0	3.7
Enterprises medium	13.3	26.7	26.7	20.0	6.7	6.7

Source: own work based on the studies.

the Oslo methodology (*Zasady gromadzenia i interpretacji*... 2008, p. 49) product innovation occurs when a new or improved product is introduced to the market. The share of new and modernised products in the total production sold or sales of innovative products that were introduced to the market reflects the implementation capacity of the enterprises.

A comparative analysis of net revenues from sales of new products and processes by medium-sized enterprises from Warmia and Mazury and the remaining provinces of Poland showed that the situation was the best in the province of Małopolskie (14.7%) (Fig. 1).

The share of revenues from innovations in total net revenues from the sales of enterprises employing 50–249 people located in Warmia and Mazury was 2.8% in 2009, which ranked them sixth. On the other hand, this value was lower than the national average (3.9%). The position of Warmia and Mazury was much better for small enterprises. The share of revenues from the sales of innovations in total revenues was 7.4% in Warmia and Mazury, which ranked it third in the country after Opolskie (10.3%) and Podkarpackie (8%), although this share was 1.4 p.p. higher than the national average.

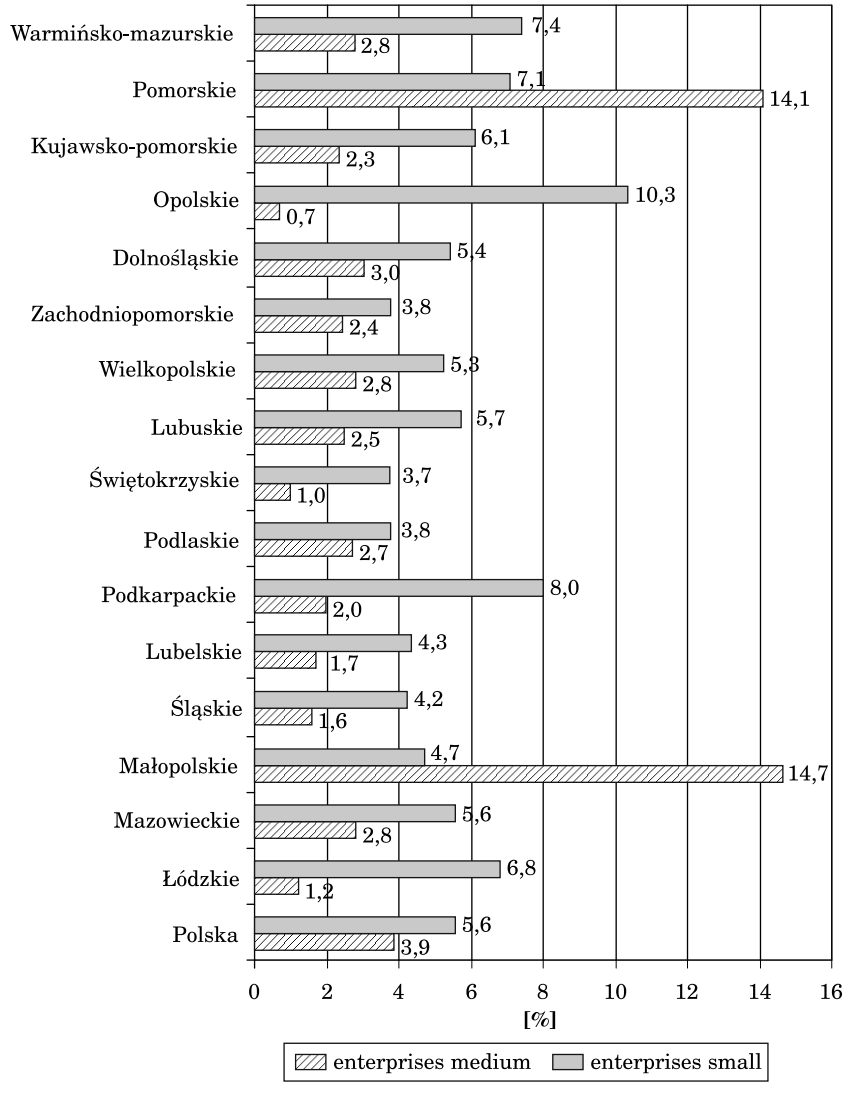

Fig. 1. Share of net revenues from sales of innovative products in the net revenues from total sales in the SME-sector in 2009

Source: own work based on the CSO, Local Data Bank, Warsaw 2010.

Conclusion

The development trends of highly-developed countries show that sustainable development can be guaranteed only by building a competitive advantage based on knowledge and innovation. The dynamic changes in an economy

resulting from technological progress cause the implementation of both local and global scale innovations to become a necessity. Such changes are possible when the enterprise possesses the capacity, which is expressed in the level spending on innovative activities. In the case of both Poland and the province of Warmia and Mazury, positive trends of systematic increases in spending on innovative activities has been observed in the SME-sector. Unfortunately, the domination of low technology sectors in the region has a direct influence on a clearly lower level of innovativeness in the entities from Warmia and Mazury.

Innovative capacity is expressed in the capacity for funding. In the surveyed population, following the national trends, own funds represented the most important funding source for implementation of innovative activities. This was probably why the respondents from the SME-sector in Warmia and Mazury considered themselves innovative in the majority of cases (62.3%). The remaining respondents declared that innovative solutions had already been implemented and that there was no need to re-implement innovative activities. It is worth adding that, considering the enterprise size, there were more innovative entities among the medium enterprises (77.3%).

The situation of enterprises in Warmia and Mazury was relatively favourable for innovative activities. Through implementation of product innovations (31.7%), entrepreneurs could react to changes taking place in the market and adjust to the requirements of consumers as well as create new needs among the consumers. The data showed that the enterprise size had a significant influence on the level of novelty, which is evidenced by the fact that small entities were interested in local- and regional-scale innovation implementation. Medium-sized entrepreneurs had higher aspirations because the innovations they implemented were mainly of a national character.

It should be emphasised that the low innovative capacity of the surveyed enterprises from Warmia and Mazury resulting from the structure of the economy was not reflected in low innovative activity. Opinions expressed by clients and the enterprise owner were the most important sources of inspiration for innovative activities. It should be added that the results of own studies are highly consistent with the results obtained by other authors.

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EVALUATION OF LIFE INSURANCE MARKET DEVELOPMENT IN POLAND DURING THE YEARS 1991–2010

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Key words: life insurance, penetration coefficient, density coefficient, insurance premium, life insurance market concentration.

Abstract

Radical changes in Poland during the last decade of the 20th c. causednot only a significant acceleration of Poland's economic growth rate but also rapid increase in the importance of insurance for the national economy. The penetration coefficient, i.e. the ratio of the gross premium written to the GDP, which in case of the total premiums increased from 1.83% in 1991 to 3.83% in 2010, and in case of life insurance from 0.26% to 2.31% respectively, is considered one of the synthetic measures of that importance. Although the Polish insurance market is developed far less than the European Union market where that coefficient is 7.9% and 4.8% respectively those differences decrease every year. The similar trend is presented by the depth coefficient that is the per capita insurance premium that additionally in case of life insurance increases faster than in case of the insurance sector as a whole. This indicates a relatively good life insurance market development rate in Poland although that market still ranks within the second half of the total number of the European Union countries' domestic markets.

OCENA ROZWOJU RYNKU UBEZPIECZEŃ NA ŻYCIE W POLSCE W LATACH 1991–2010

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Słowa kluczowe: ubezpieczenia na życie, współczynnik penetracji, współczynnik gęstości, składka ubezpieczeniowa, koncentracja rynku ubezpieczeń na życie.

Abstrakt

Radykalne zmiany w ostatnim dziesięcioleciu XX wieku w Polsce spowodowały nie tylko znaczne przyspieszenie tempa wzrostu gospodarczego Polski, lecz także szybki wzrost znaczenia ubezpieczeń dla gospodarki narodowej. Za syntetyczny miernik tego znaczenia uznaje się m.in. współczynnik

penetracji, czyli stosunek składki przypisanej brutto do PKB, który w przypadku składek ogółem wzrósł z 1,83% w roku 1991 do 3,83% w roku 2010, a w przypadku składek z ubezpieczeń na życie odpowiednio z 0,26% do 2,31%. Choć wciąż polski rynek ubezpieczeń jest znacznie słabiej rozwinięty niż rynek Unii Europejskiej, gdzie wskaźniki te kształtują się odpowiednio w wysokości 7,9% i 4,8%, to różnice te zmniejszają się każdego roku. Podobną tendencję wykazuje współczynnik głębokości, czyli wartość składki ubezpieczeniowej przypadająca na jednego mieszkańca, który dodatkowo w przypadku ubezpieczeń na życie wrasta znacznie szybciej niż w przypadku ubezpieczeń ogółem. Świadczy to o dość dobrym tempie rozwoju rynku ubezpieczeń na życie w Polsce, choć nadal rynek ten pod tym względem zajmuje miejsce w drugiej połowie ogólnej liczby rynków krajowych UE.

Introduction

The Polish life insurance market dates back to 1844 when in the territory of the former Congress Kingdom, the state insurance company – Dyrekcja Ubezpieczeń (Insurance Directorate) opened a life insurance division. Towarzystwo Wzajemnych Ubezpieczeń (Mutual Insurance Company, popularly referred to as "Florianka"),established in 1860 in Kraków, was the first Polish private insurance company offering life insurance. Rapid life insurance development took place, however, only at the beginning of the 20th c. when, almost simultaneously, three life insurance companies were established (in Poznań, Lwów and Gdańsk). After World War I, life insurance development was based mainly on organised group insurance as individual insurance developed very slowly. Starting in 1960, pension insurance was sold and was popularamong professions that did not benefit from disability or old age pensions from the state social insurance plan. Gradually, further options of life insurance were introduced – insurance to secure children, insurance of two lives, etc. Nevertheless, the full expansion of the life insurance market took place after 1989 when the socioeconomic transformations took place in Poland.

New insurance law

New development of the insurance law in Poland after 1989 occurred on July 28, 1990, when the new Act on Insurance Activity liquidated the monopoly of Państwowy Zakład Ubezpieczeń (State Insurance Company) and restructured the insurance market (HANDSCHKE 2009). The Act was based on the provisions of the European Economic Community (European Union) Directives that created four pillars of the uniform insurance market, i.e. free flow of goods, free flow of labour, freedom in establishing enterprises and providing services and free flow of capital. The principle of freedom in establishing enterprises and providing services was of major importance as it meant that an

Table 1

Number of licenses for conducting life insurance activity from 1989–1999

Year	Until 1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Number of licenses	–	2	4	1	1	4	3	2	6	3	7

Source: own work based on: *Przegląd dziesięciolecia. Rozwój ubezpieczeń w Polsce w gospodarce wolnorynkowe*j, 2001, p. 15.

Table 2

Number of licenses for conducting life insurance activity from 2000–2010

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Companies conducting activity	32 (including 1 main branch)	36 (including 1 main branch)	35 (including 1 main branch)	35 (including 1 main branch)	32	32	31	32	30	30	30
Companies possessing a license	34	36	35	36	34	34	32	33	31	31	30

Source: own work based on: *Polish Financial Supervision Authority*, www.knf.gov.pl (access: 04.06.2012).

insurance company, on the basis of the authorisation (license) of the country of its registered headquarters, was free sell its products in any European Union country. Table 1 presents the number of licenses issued in Poland by 1999 by the Minister of Finance for conducting insurance activities in life insurance while Table 2 presents the number of insurance companies conducting life insurance activities during the years 2000–2010. The consecutive amendments of the Act on Insurance Activity in 1995, 1998, 2000 and 2001 aimed at further cohesion of the Polish law and the European Union legislation and involved, among others, establishing the insurance supervision and comprehensive regulation of insurance intermediation (1995), defining the principles of operation of foreign insurance companies in Poland (1998), defining the financial management conditions of insurance companies, including the conditions that the assets representing the technical-insurance reserve coverage should meet (2000) and determining the principles of conducting business by foreign entities (2001). The most extensive adjustment of Polish legislation to the EU Directives took place on the basis of the package of Acts of the 22nd of May 2003, which included the Act on Insurance Activity, the Act on Compulsory Insurance, the Insurance Guarantee Fund and the Polish Motor Insurers' Bureau, the Act on Insurance Intermediation and the Act on Insurance and Pension Supervision and the Insurance Ombudsman. After 2003, however, those Acts were also amended several times. The Act on Insurance Activity introduced a division into two segments: segment I – life insurance which encompasses five groups of insurance – life insurance, dowry insurance, endowment of children insurance, life insurance linked to an investment (capital) fund, pension insurance, accident and disease insurance representing a complement to the above-indicated insurance types and segment II – other personal insurance and property insurance which consists of 18 groups of insurance (*Ustawa o działalności ubezpieczeniowej*... 2003). Table 1 presents the number of licenses issued to insurance companies for operating life insurance activities during the period of the insurance market formation during the years 1991–1999, while Table 2 presents the number of insurance companies operating and licensed in that field from 2000–2010.

Synthetic characteristics of the Polish life insurance market

The basic aim of life insurance is to secure a specific living standard to persons financially dependent on the insured after his/her death by disbursement of the insurance benefit (STROIŃSKI 2003, p. 11). The other aims are to secure the insured in case of disaster in the form of disability, inability to work

or disease, accumulation and multiplication of savings as well as securing the interests of the employer or partner whomay incur a material loss as a result of death of the insured. The group life insurance, with low insurance amounts covering many additional risks such as childbirth, death of parents or parents-in-law of the insured, is a life insurance product unique to Poland (DOAN 1996, p. 20).

Life insurance development in a given country depends on numerous factors. The following are among the most important ones among them:

– economic development level of the given country,
– legal system in force as concerns social insurance,
– legal system in force as concerns economic insurance,
– resources and living standards of the population,
– tax system,
– level of development of the financial institutions and capital market,
– family model and demographic factors.

The value of the gross premium written in relation to the GDP (i.e. the penetration coefficient) is considered a synthetic measure of insurance importance for the national economy. Its value in Poland during the years 1991–1999 is presented in Figure 1, which also includes the value of the segment I insurance premium in relation to the GDP. While in 1991 the total gross written premium of insurance companies represented 1.83% of the GDP (for segment I – 0.26%), in 1996 it exceeded the barrier of 2% and achieved a value of 2.12% (for segment I, the premium exceeded the barrier of 1% in 1999 (reaching the value of 1.13%) and the barrier of 2% in 2006). Figure 2 presents the coefficients of the total insurance premium in the GDP of Poland as well as the coefficients of the insurance premium share in the EU in the GDP of the EU. Although the penetration coefficient in Poland reached the level of 3.83% in 2010, it is still over twice lower than the average coefficient for the EU countries (7.9%), and the position of Poland in that respect is quite low (20).

Figure 3 presents the share of segment I insurance premium in Poland in the GDP of Poland and the share of segment I insurance premium in the EU in the GDP of the EU. Although in Poland that share has increased systematically, it is still over two times lower than in the EU countries (in 2010,2.31% and 4.84%, respectively), although the 16th place of Poland among the EU countries as concerns that indicator is still higher than the 20th position for the total indicator.

There has beena continual, although small, increasingtrend in this indicator during the past decade despite the decrease that occurred in both Poland and the EU in 2009.

The per capita insurance premium value (the so-called density coefficient) is another synthetic measure of the insurance market development. In Poland,

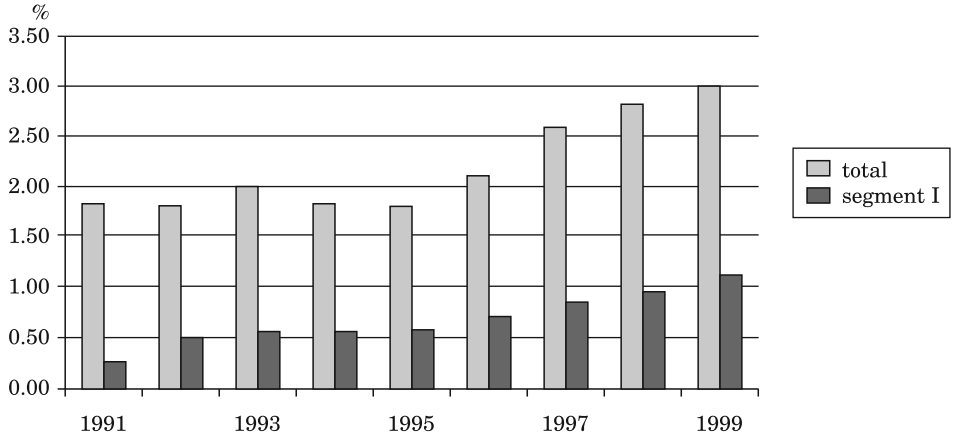

Fig. 1. Share of the total and segment I insurance premium in the GDP of Poland
Source: own work based on: *Przegląd dziesięciolecia. Rozwój ubezpieczeń w Polsce w gospodarce wolnorynkowej* (2001, p. 19).

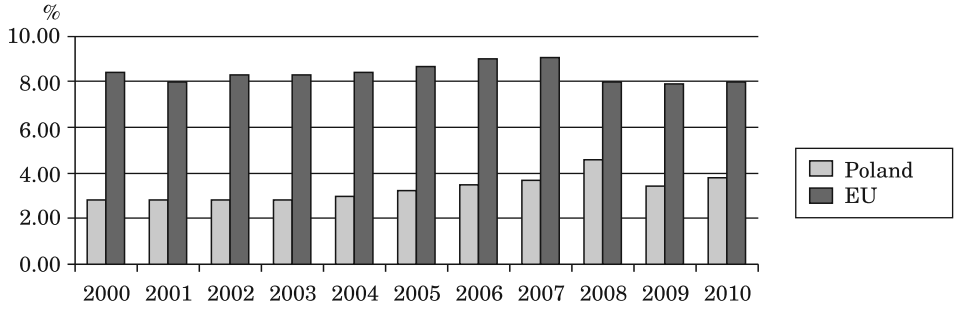

Fig. 2. Share of the total insurance premium in Poland in the GDP of Poland (%); Share of the total insurance premium in the EU in the GDP of the EU (%)
Source: own work based on: *Comite Europeen des Assurances (CEA)*, www.cea.eu (access: 04.06.2012).

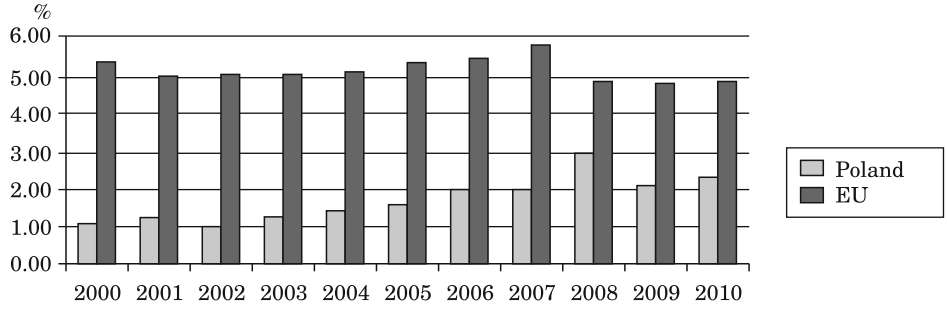

Fig. 3. Share of the segment I insurance premium in Poland in the GDP of Poland (%); Share of the Segment I insurance premium in the EU in the GDP of the EU (%)
Source: own work based on: *Comite Europeen des Assurances (CEA)*, www.cea.eu (access: 04.06.2012).

total expenditures on insurance during the 1990s increased by over twelve-fold nominally (from PLN 39 in 1991 to PLN 479 in 1999) while those expenditures on segment I insurance increased by thirty-fold (from PLN 6 to PLN 180) (Tab. 3). Total insurance expenditures measured in dollars increased by over three-fold and in segment I by over ten-fold. During the years 2000-2010, the total per capita premium in Poland was higher by 2.66-fold in 2010 than in 2000, while in segment I it was as much as 3.56-fold higher. During the same time, the total per capita premium in the EU was higher by 1.25-fold and in segment I by 1.15-fold (Tab. 4). In 2000, Poles allocated $187 for insurance, of which $75 was allocated to segment I insurance while in 2010 the amounts were $489 and $299, respectively. In the European Union, those amounts in 2000 were $2,325 and $1,513 respectively and in 2010 $2,888 and $1,744, respectively. The expenditures per capita on insurance in the EU during the years 1991–1999 averaged €1,053, including €550 on life insurance (representing 52.23% of the total expenditures on insurance) (Fig. 4). In Poland, only in 2006 did expenditures on life insurance exceed the expenditures on other personal and property insurance (representing 56.44% of the total expenditures) and in 2010 this percentage reached 58.02% (Fig. 5). During the same period in the European Union, that indicator reached the level of 60.77%. As of 1997, a clear increase in per capita premiums took place and it was the highest in 1996, when in segment I the increase compared to 1995 was 50% and for segment II it was 44.32%.

Table 3

Value of per capita premium in Poland

Segment \ Year		1991	1992	1993	1994	1995	1996	1997	1998	1999
Segment I	PLN	6	14	23	33	48	72	105	139	180
	$	5	10	13	15	20	27	32	40	46
Total	PLN	39	54	80	107	145	212	318	403	479
	$	37	40	44	47	60	79	97	115	121

Source: own work based on: *Przegląd dziesięciolecia. Rozwój ubezpieczeń w Polsce w gospodarce wolnorynkowej* (2001, p. 19).

In 2003, a slight decrease in this indicator occurred in both segment I and segment II while during the years 2004–2008 the yearly average increase in segment I was almost 50%, while in segment II it was over 28%. In 2009, a significant decrease in per capita insurance premiums in Poland occurred and in segment I it was 37.44% while in segment II it was 13.37% (Tab. 4). In 2010, however, a significant increase in the indicator occurred (by 14.6%) although in the EU this increase was only 0.25%. It is also interesting that in

European Union countries, the decrease of this indicator in segment I was recorded, not in 2009 as in Poland, but in 2008, while the value of the decrease in segment I was 17.24%.

Table 4

Per capita premium value in Poland and in the EU

Country, segment \ Year			2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Poland	segment I	PLN	213	260	264	260	287	394	560	673	1146	717	822
		$	75	91	93	91	101	139	197	237	403	252	289
		Euro	54	66	67	66	73	100	142	171	291	182	209
	total	PLN	532	626	618	579	630	795	992	1173	1737	1229	1417
		$	187	220	218	204	222	280	349	413	611	432	499
		Euro	135	159	157	147	160	202	252	298	441	312	360
EU	segment I	PLN	4300	4213	4154	4107	4379	4871	5277	5824	4820	4942	4954
		$	1513	1482	1462	1445	1541	1714	1857	2049	1696	1739	1744
		Euro	1092	1070	1055	1043	1112	1237	1340	1479	1224	1255	1260
	total	PLN	6608	6639	6679	6761	7123	7698	8336	8935	7946	8132	8234
		$	2325	2336	2350	2379	2506	2709	2933	3144	2796	2861	2888
		Euro	1678	1686	1696	1717	1809	1955	2117	2269	2018	2065	2095

Source: own work based on: *Comité Européen des Assurances* (*CEA*), www.cea.eu (access: 04.06.2012).

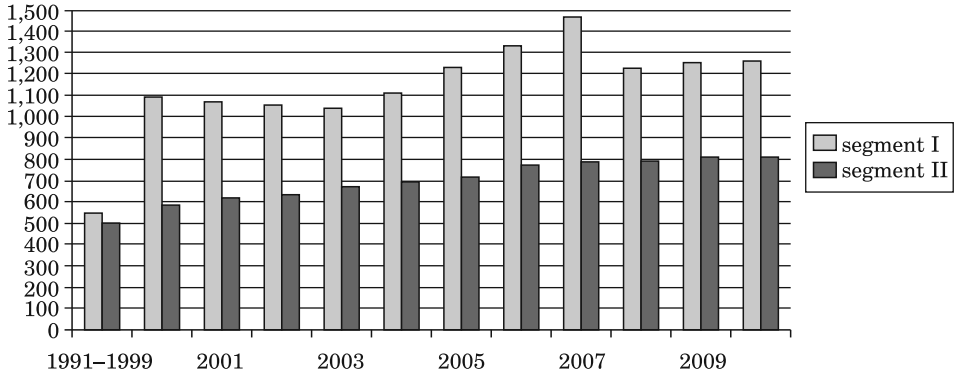

Fig. 4. Per capita insurance premiums in segment I and Segment II in the EU during the years 1991–2010 (EUR)

Source: own work based on: *Comité Européen des Assurances* (*CEA*), www.cea.eu (access: 04.06.2012).

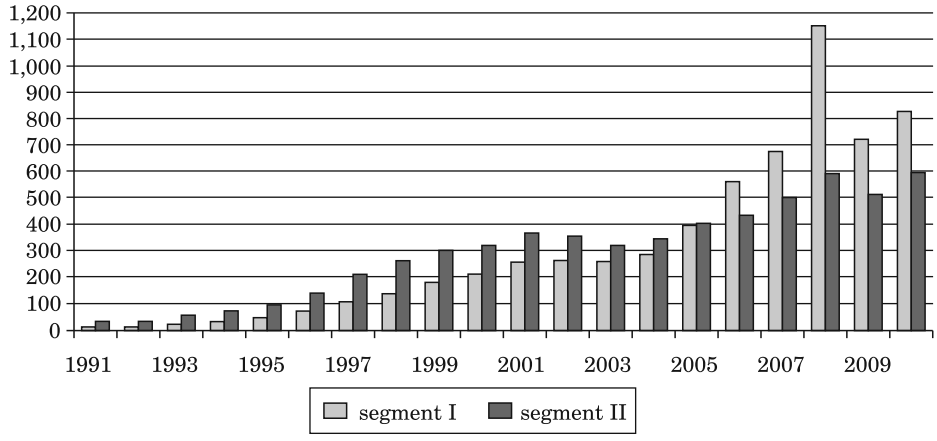

Fig. 5. Per capita insurance premium in segment I and segment II in Poland during the years 1991–2010 (PLN)

Source: own work based on: *Comite Europeen des Assurances* (*CEA*), www.cea.eu (access: 04.06.2012); *Przegląd dziesięciolecia. Rozwój ubezpieczeń w Polsce w gospodarce wolnorynkowe*j (2001, p. 19).

Characteristics of the life insurance market in Poland during the years 1991–2010

The 1990s were characterised by high insurance premium growth dynamics. In 1999, the gross written premiums in the life insurance segment was thirty-fold higher than in 1991 (in 1999 PLN 6,940 million compared to PLN 208 million in 1991). The average yearly gross written premium growth rate during the years 1991–1999 was 57.88%, with the peak in 1992 (162.02%), and the lowest increase in 1999 (20.68%) (Fig. 6). During the years 2000–2010, the average yearly gross written premium growth rate in the life insurance segment was 17.45%, with the peak in 2008 (52.86%); the worst result was recorded in 2009 (-22.32%) (Fig. 7). In 2008, the structured products, particularly the so-called "policy-investments" thanks to which the investors did not have to pay the capital gain tax, enjoyed very high popularity. As a consequence of that, among others, the segment I gross premium written increase in 2008 was as much as 52.86%. In 2009, the offer from insurance companies shrank significantly, which caused a decrease in premiums collected from life insurance by 22.32%. The structure of segment I gross premiums written during the years 1995–1999 is presented in Figure 8, while that structure for the years 2000–2010 is presented in Figure 9. Until 2007, the group 1 (life insurance) share decreased continually while the share of group 3 (life insurance with the insurance capital fund) increased. That trend changed in 2008 when premiums in group 1 again increased faster than the premiums in

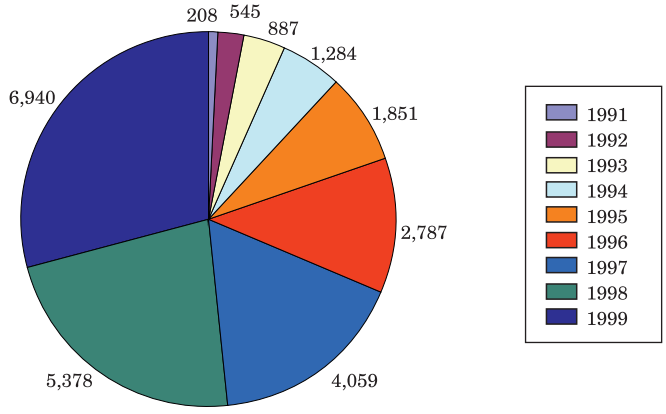

Fig. 6. Gross premiums written in segment I during the years 1991–1999 (million PLN)
Source: own work based on: *Przegląd dziesięciolecia. Rozwój ubezpieczeń w Polsce w gospodarce wolnorynkowej*, 2001, p. 29.

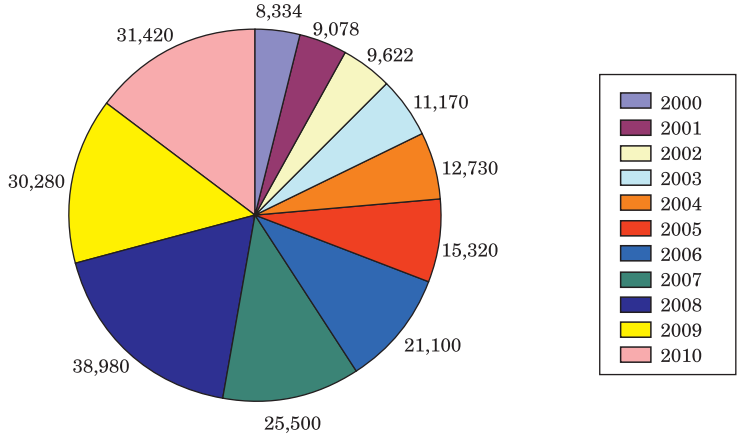

Fig. 7. Gross premiums written in segment I during the years 2000–2010 (million PLN)
Source: own work based on: *Polish Insurance Association*, www.piu.org.pl. (access: 04.06.2012); *Polish Financial Supervision Authority*, www.knf.gov.pl (04.06.2012).

group 3; the increase in group 5 (accident and disease insurance) was also faster.

In 2010, the premiums written in group 1 life insurance had the highest share in the segment I gross written premiums. Within that group, insurance products with a single premium had a very significant share, at as much as 70% (it should be assumed that the group was dominated by products that were anti- capital-gains-tax products) (*Ubezpieczeni*a 2010), although the value of the single premium decreased by 5.1% as compared to the preceding year,

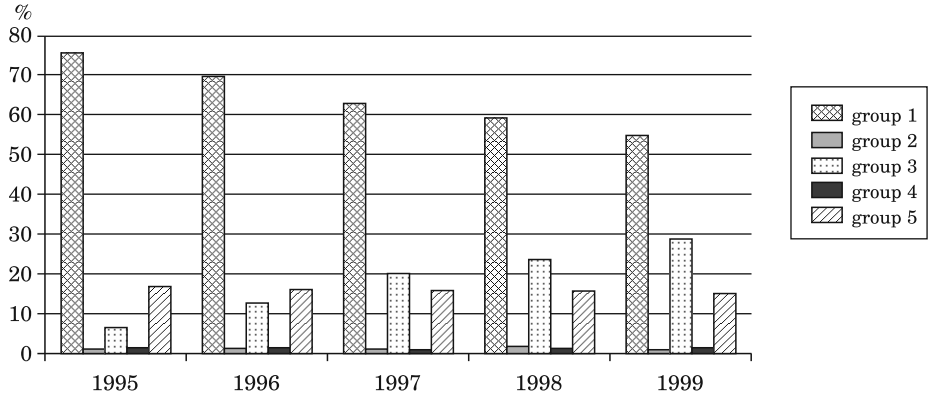

Fig. 8. Structure of gross premiums written in segment I in Poland during the years 1995–1999 (in %)
Source: own work based on: *Przegląd dziesięciolecia. Rozwój ubezpieczeń w Polsce w gospodarce wolnorynkowej* (2001, p. 34).

which, combined with the increased number of policies issued in 2010, indicates its dispersion (decrease).

The value of disbursed damages and benefits in the life insurance segment is another indicator characterising the insurance market. Its total value in 1999 amounted to PLN 2,144 million and was almost 20 times higher than in 1991. During that period, the year average damages and benefits increased by 39.7% year-to-year with the highest increases in 1992 and 1993. The lowest increase occurred in 1999 (14.6% as compared to the preceding year). The statistics of damages and benefits during the years 2000–2010 in Poland is presented in Figure10. The highest increase in damages and benefits occurred in 2008 in group 1 and that value was higher by as much as 110.65% as compared to the situation of 2007; a large increase also occurred in 2009 at 93.67% as compared to 2008. The damages and benefits disbursed in 2010 were over four times higher than in 2000 and more than two hundred and sixteen times higher than in 1991. During the period of 2000–2010, the yearly average gross damages and benefits in group 1 increased by 130% (mainly as a consequence of an increase in 2008 by 111% as compared to 2007 and an increase by 93.67% as compared to 2008); in group 2 it was 12%, in group 3–62%, in group 4–5%, and in group 5–17%. During the entire year of 2010, as compared to 2009, in segment I the value of gross damages and benefits decreased, however, by 18.4% (as many as 11 insurance companies disbursed lower damages and benefits in segment I compared to the preceding year with the highest decrease recorded by the AXA Życie S.A. insurance company).

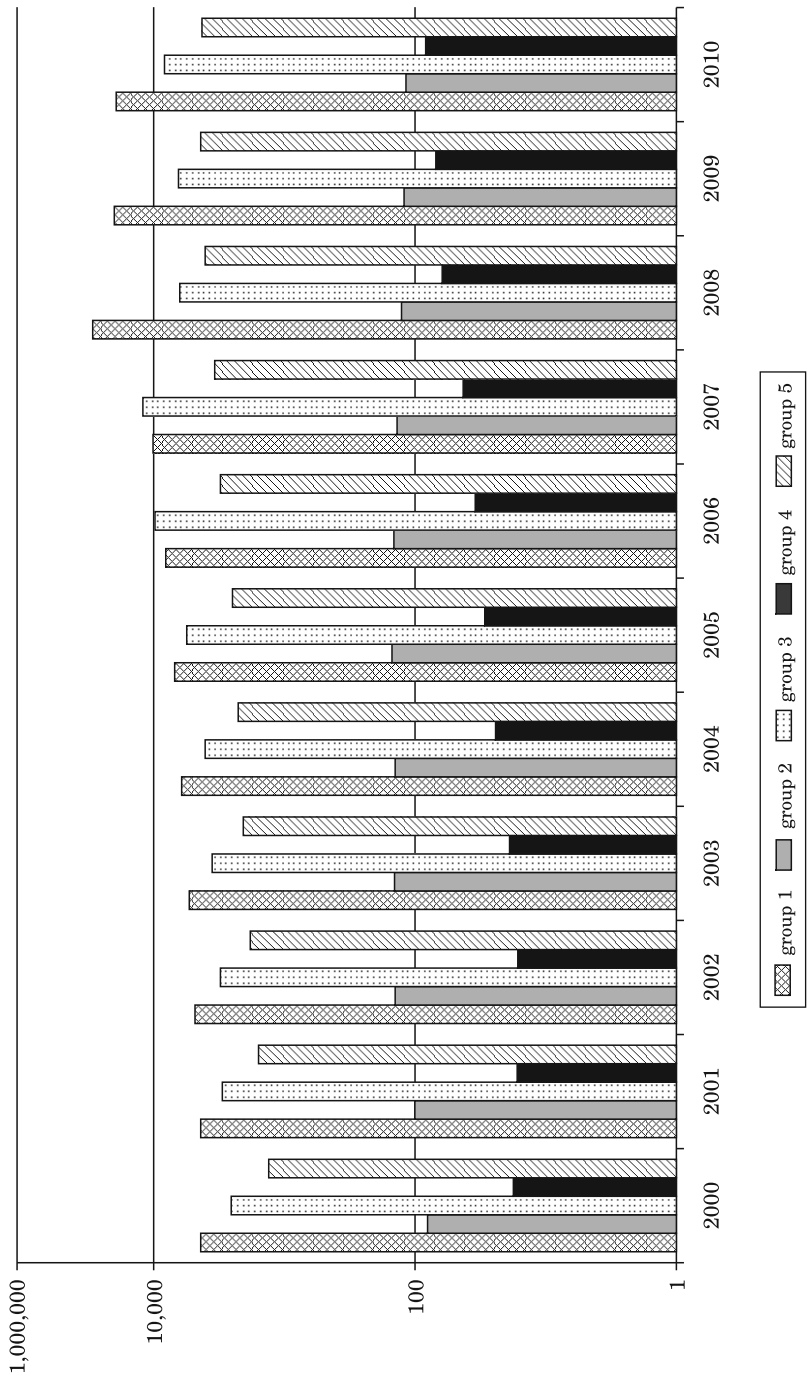

Fig. 9. Structure of gross premiums written in segment I in Poland during the years 2000–2010 (million PLN)
Source: own work based on: *Polish Financial Supervision Authority*, www.knf.gov.pl (access: 04.06.2012).

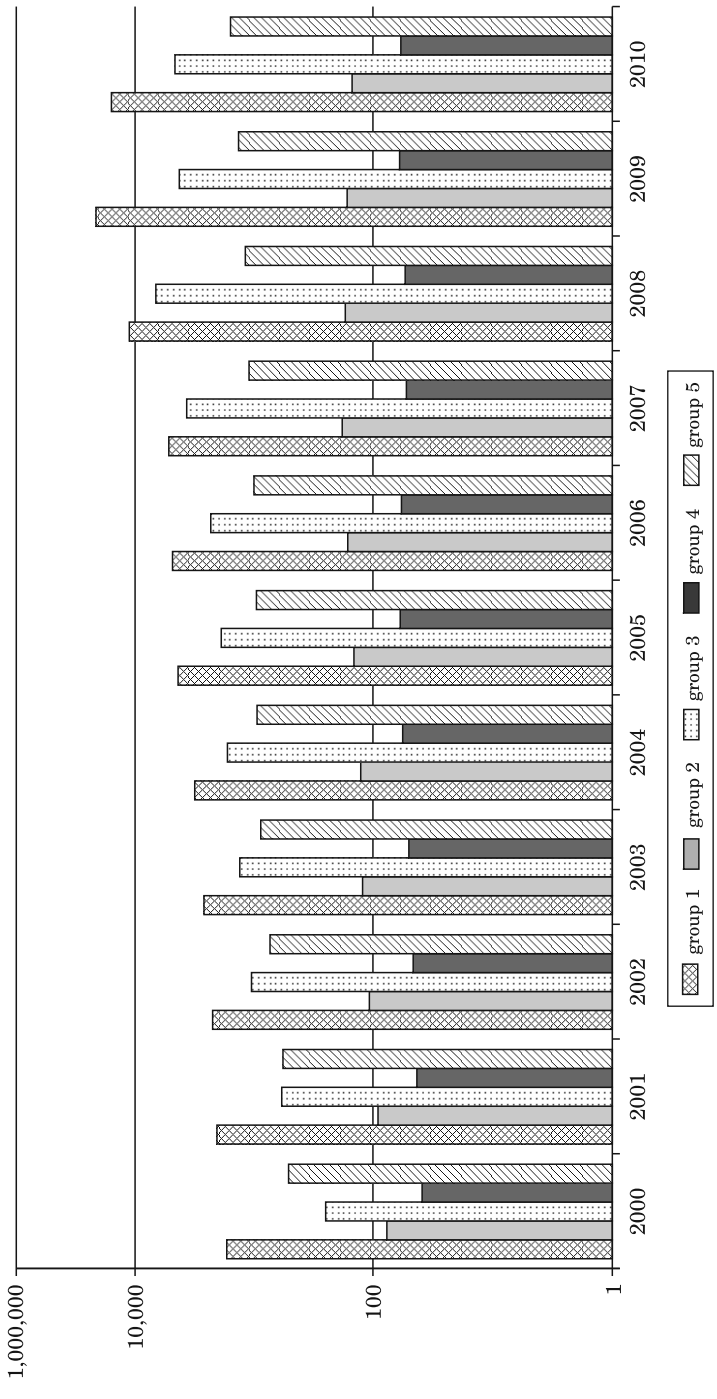

Fig. 10. Structure of gross damages and benefits disbursed in segment I in Poland during the years 2000–2010 (million PLN)
Source: own work based on: *Polish Financial Supervision Authority*, www.knf.gov.pl (access: 04.06.2012).

The indicator of costs of canvassing and administration in segment I (the value of which is given in Figures 11 and 12) is the next indicator characterising the insurance market. The costs of canvassingincreased from PLN 22.1 million in 1991 to PLN 989.2 million in 2000, which is almost 45-fold. As of the beginning of 1997, the growth rate of those costs showed a decreasing trend because for the period of the years 1997/1996 it was 51.8%, 1998/1997 – 25.36%, 1999/1998 – 19.7%. Next, from2000-2005,the growth rate was just a few percent and from 2006–2010 again those costs increased on average by around twenty percent a year. In the case of the costs of administration, the largest increase during the years 1991–1999 occurred in 1992 when they

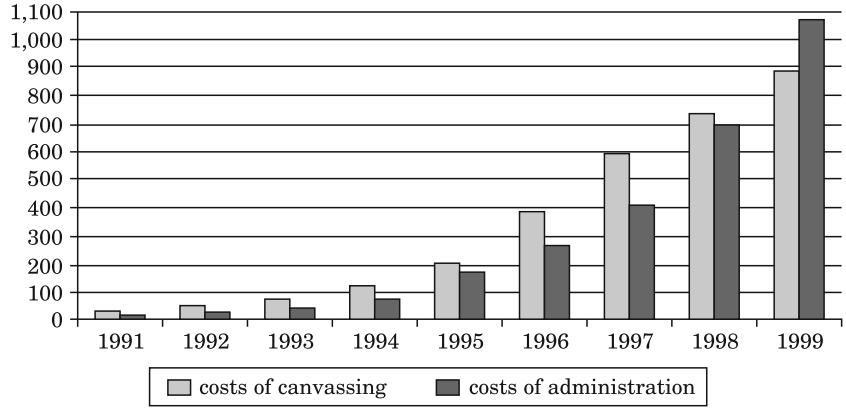

Fig. 11. Costs of canvassing and administration in segment I in Poland during the years 1991–1999 (million PLN)

Source: own work based on: *Przegląd dziesięciolecia. Rozwój ubezpieczeń w Polsce w gospodarce wolnorynkowej* (2001, pp. 40–42).

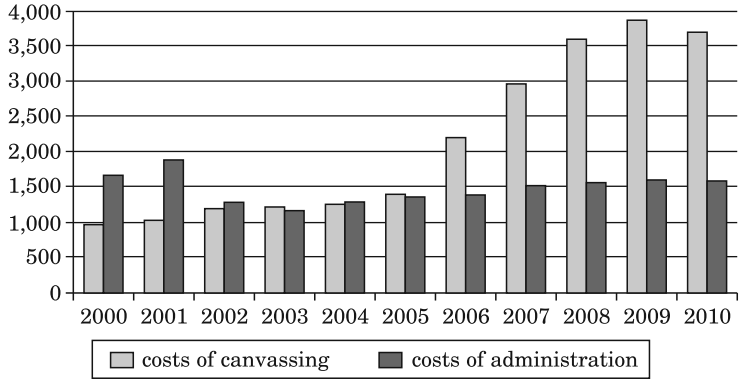

Fig. 12. Costs of canvassing and administration in segment I in Poland during the years 2000–2010 (million PLN)

Source: own work based on: *Polish Financial Supervision Authority*, www.knf.gov.pl (access: 04.06.2012).

doubled compared to 1991 and in 1995 when that increase was almost four-fold higher compared to 1994. The average yearly indicator of the costs of administration increases in segment I was around 167% during the years 1991–1999. During the years 2000–2010, the highest increase in the costs of administration was recorded in 2001 (12.25% as compared to 2000); during the consecutive years,this value then decreased significantly (by 31.63% in 2002 as compared to 2001, and by 8.52% in 2003 as compared to 2002), and then during the years 2003-2010 it was at anaverage yearly level of around 6%.

The level of costs of canvassing in segment I in 2010 as compared to 2009 decreased by 3.3%, although still the costs of canvassing are over 70% in the insurance activity costs structure.

The life insurance segment generated positive net results during the individual years (with the exception of 1992) (Fig. 13). Each year also saw an increase in positive financial results (with the exceptions in 1995, 1999 and 2008, when the positive financial result decreased by 42%, 19.5% and 24% respectively). The largest increase in the net financial result occurred in 1993 (almost 49-fold) and in 1996 (1.64-fold), while the lowest increases were recorded in 2004 (0.13-fold) and 2007 (0.14-fold) (Fig. 14). In 2009, insurance companies generated a net financial result of PLN 6,686 million, of which 60% was generated by life insurance companies (exactly PLN 4,009 million), while 40% was generated by companies operating in the segment of property insurance and other personal insurance. In the life insurance segment, the result of 2009 was higher by 59.3% than the result generated in 2008; however, in 2010 it decreased by 8.9% as compared to the result for 2009. It is also worth highlighting that the technical result in segment I in 2010 was positive, amounting to PLN 3,593 million as opposed to segment II where during that year,a negative result was generated amounting to PLN 1,284 million.

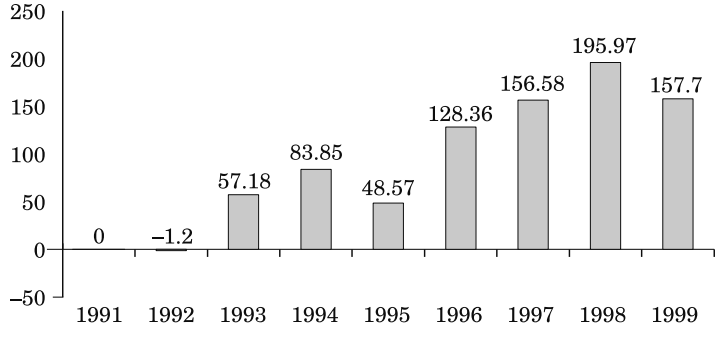

Fig. 13. Net financial result in segment I in Poland during the years 1991–1999 (million PLN)

Source: own work based on: *Przegląd dziesięciolecia. Rozwój ubezpieczeń w Polsce w gospodarce wolnorynkowe*j, 2001, p. 72.

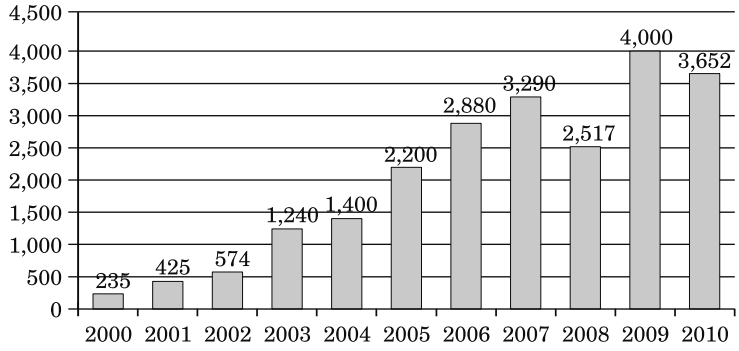

Fig. 14. Net financial result in segment I in Poland during the years 2000–2010 (million PLN)
Source: own work based on: *Polish Financial Supervision Authority*, www.knf.gov.pl (access: 04.06.2012).

Figures 15 and 16 present the life insurance market concentration in Poland in 2000 and 2010. In 2000, ten insurance companies had a joint share in the gross premiums written amounting to 96.33%, while in 2010 that share was only 83.63% (in 1991, that share was 94.19%, and in 1995 it was 84.28%).

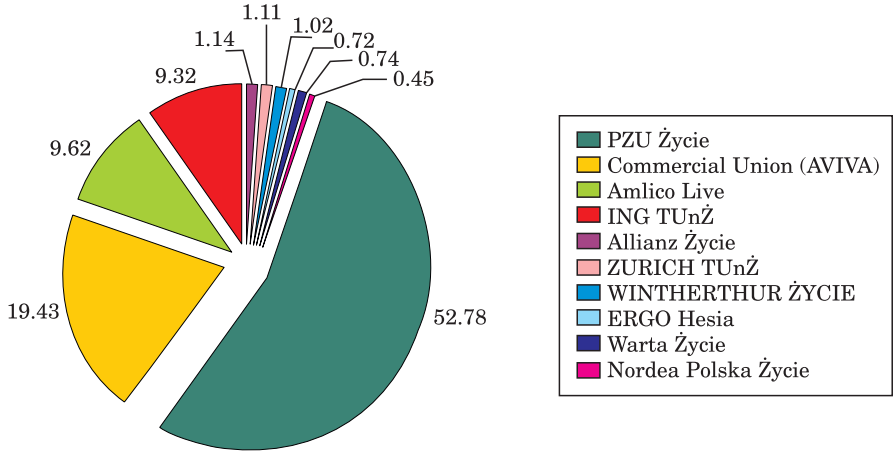

Fig. 15. Segment I gross premium written structure considering the insurance companies with the highest share in 2000 (in %)
Source: own work based on: *Polish Financial Supervision Authority*, www.knf.gov.pl (access: 04.06.2012).

The change in the structure of premiums in segment I according to insurance company resulted, among others, from a decrease in 2010 as compared to 2009 in the gross premiums written for 11 life insurance companies.

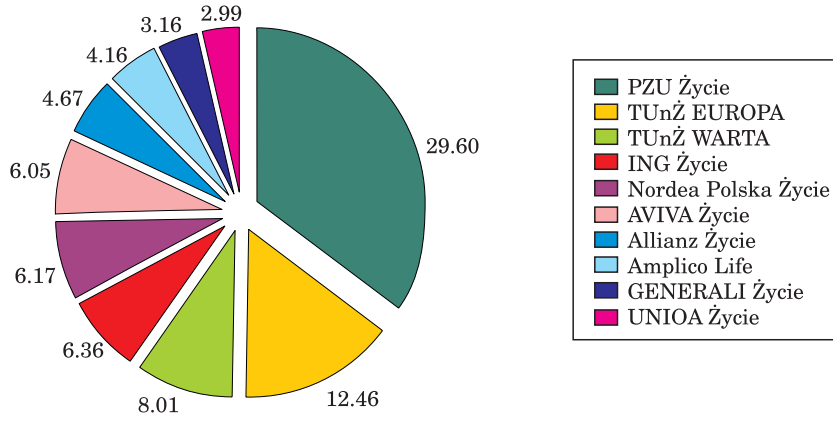

Fig. 16. Segment I gross premium written structure considering the insurance companies with the highest share in 2010 (in %)

Source: own work based on: *Polish Financial Supervision Authority*, www.knf.gov.pl (access: 04.06.2012).

Conclusion

The indicators used in this paper for evaluation of the life insurance market development in Poland during the years 1999–2010 do not include key datafor a more comprehensive and detailed evaluation of the market development level. For example, the population of life insurance companies operating in the Polish market could be divided into companies with a majority of foreign or domestic capital. Also, the value and dynamics of balance sheet holdings of insurance companies, structure of assets of the insurance sector during the individual years, the structure of investments by insurance companies, value of investments in securities and loans to enterprises and time deposits by insurance companies, ownership changes in the insurance sector and changes of shareholders in the insurance companies, foreign investments in the insurance sector, direct involvement of public funds in the insurance sector and the share of technical-insurance provisions in the amount of liabilities could also be considered. A detailed evaluation of life insurance market development would also require selected indicator analysis of the insurance market, including the solvency ratio of the life insurance companies, debt ratio, ratio of damages on the deductible and the profitability of life insurance operations. Such analysis also includes detailed insurance market data, in this case, life insurance market development projections.

In this paper, however, the assumption was made that the evaluation of the life insurance market development in Poland from1991–2010 would be conducted by means of an analysis of those market development indicators that were

used the most often to compare the insurance markets in different EU countries. Those indicators include, above all, the penetration coefficient and the density coefficient. Analysis of their values indicates that the disproportion in those indicators between Poland and the EU has decreased from year-to-year, although a significant gap still exists. In 2006, for the first time in Poland, the life insurance premiums amounted to more than property and other personal insurance premiums and, as a consequence, the premium type structure typical for the majority of the EU countries was achieved. In 2009, the life insurance premiums in Poland represented 58.33% of total premiums, while in the EU they represented 60.77%. The data confirms the hypothesis assumed in the paper that, for Poles, life insurance has become an important component of risk control in daily life. Given the premium structure in segment I, it can be concluded that life insurance (group 1) is of the largest importance followed by life insurance with an investment fund (group 3; in this case, a dynamic premium increase occurred in 2010), and accident and disease insurance (group 5). Additionally, life insurance market concentration has been confirmed by the dominant position of the PZU Życie insurance company, although its market share has steadily decreased (in 2000 – 52.78%, in 2010 – 29.60%). High market concentration also continued, as the 10 largest life insurance companies in 2010 held over 83.63% of the life insurance market (in 2000 – 96.33%); in comparison, the 10 largest segment II insurance companies slightly exceeded 80% in 2010. The significant decrease in the technical result of segment I in 2010 also indicates the necessity to increase the insurance premium rates, which is also confirmed by the segment I insurers own capital profitability coefficient (in segment II, however, as many as 17 insurance companies recorded net losses on their operations). This may mean, among others, the necessity of spatial diversification of life insurance premiums in the territory of Poland, which might influence the intensification of such insurance sales levels in the Polish market (ŚLIWIŃSKI 2012, p. 18). Implementation of such an operational strategy may contribute to building competitive advantages in the life insurance market and increasing operational effectiveness, while maintaining the financial security of operations.

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POLISH INSURANCE MARKET COMPARED TO SELECTED EUROPEAN COUNTRIES IN THE YEARS 2000–2010

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K e y w o r d s: insurance market, premium written, density coefficient, penetration coefficient.

A b s t r a c t

This paper presents the insurance market in Poland and selected European countries. The most important parameters characterising this segment of the financial market were used. The premiums written, population and GDP were analysed to outline the major changes occurring among the insurers operating in Poland and the CEA[1] member countries.

POLSKI RYNEK UBEZPIECZENIOWY NA TLE WYBRANYCH PAŃSTW EUROPEJSKICH W LATACH 2000–2010

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S ł o w a k l u c z o w e: rynek ubezpieczeniowy, przypis składki, współczynnik gęstości, współczynnik penetracji.

A b s t r a k t

W artykule przedstawiono rynek ubezpieczeniowy w Polsce i wybranych państwach europejskich. Wykorzystano najważniejsze parametry charakteryzujące tę część rynku finansowego. W celu nakreślenia głównych zmian zachodzących wśród ubezpieczycieli funkcjonujących w Polsce i w krajach CEA przeanalizowano przypis składki, populację oraz PKB.

[1] CEA – Comitè Europèen des Assurances – European Insurance Federation associates institutions dealing with insurance from 33 countries. The Polish Insurance Association is a CEA member.

Introduction

Ten years ago, T. Sangowski wrote that the Polish insurance market was "young, small and at the initial stage of development" the evaluation and comparison of which to the European or global market was difficult (SANGOWSKI 2002, p. 179). After another ten years, large changes in the market structure and insurance premiums written have occurred in the Polish insurance market. The accession of Poland to the European Union in 2004 was also an important event. It caused the Polish insurance market to be included in the Community insurance market (*Rynek ubezpieczeń komunikacyjnych*... 2010, p. 189). The progressive globalisation of the world economy, including globalisation of the insurance market, influenced the functioning of the uniform insurance market of the EU (MONKIEWICZ 2010, p. 393). This paper aims at presenting the situation in the Polish insurance market during the years 2000–2010 and comparing it with selected European Union countries.

Insurance development may be considered in two dimensions: as a decisive component of the financial development of a country and as a factor of long-term economic development (BEDNARCZYK 2011, p. 86).

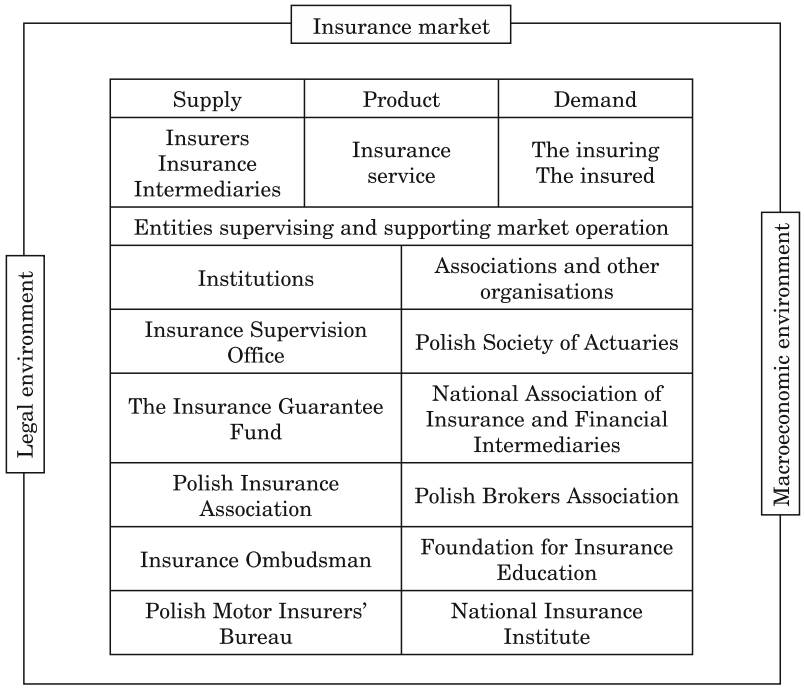

Fig. 1. The insurance market

Source: own work.

The insurance market is a component of the financial market. It is the meeting place between those searching for insurance coverage and those offering such coverage. The demand side is represented by the insuring and the insured. Insurance services are provided by the insurers and their intermediaries. Additionally, entities with the task of, *inter alia*, supervision of the insurance market as well as those conducting educational, informational and training activities operate in the insurance market (Fig. 1).

In the market economy, the insurance market is classified as a dynamically developing sector of the national economy which influences, as a consequence, the entire financial market. Insurance allows stabilisation of market participants: households and business entities helping in effective risk management and optimal placement of capital as well as generation of savings (*Polski rynek ubezpieczeniowy 2004–2008* 2009, p. 76). The increasing importance of this segment of the market in the field of financial services is continually highlighted (TREDER 2007, pp. 8–9).

Insurance market development

Determination of the competition conditions in the market is possible by counting the number of insurance companies. On the other hand, the value of insurance premiums written determines the development of individual insurers as well as the entire market (SANGOWSKI 2002, p. 196). The density coefficient and the penetration coefficient are important factors for evaluating and comparing this market to the markets in other countries (ZHENG et al. 2008, p. 3).

The number of insurance companies in Poland at the end of 2011 was 62 (Fig. 2) while the number of foreign insurance companies licensed in Poland, either providing services or operating through a branch, as at the end of the 3rd quarter of 2011 was 564 (including 17 branches).

The number of insurance companies in the Polish insurance market increased steadily until 2003.

During the first year following the introduction of the Act on Insurance Activity of 1990[2], just 24 insurance companies were in operation while at the end of 2003 their number was 78, which represents an over three-fold increase. As of 2004, the situation stabilised and the number of insurance companies during the years 2004–2011 ranged from 70 to 62. This is the result of the insurance market concentration and globalisation. During 1990s the companies offering property insurance dominated. As of 2000, the numbers of companies from Life and Non-life insurance were at similar levels.

[2] Act on Insurance Activity (Dz.U. 1990, No. 59, item 344).

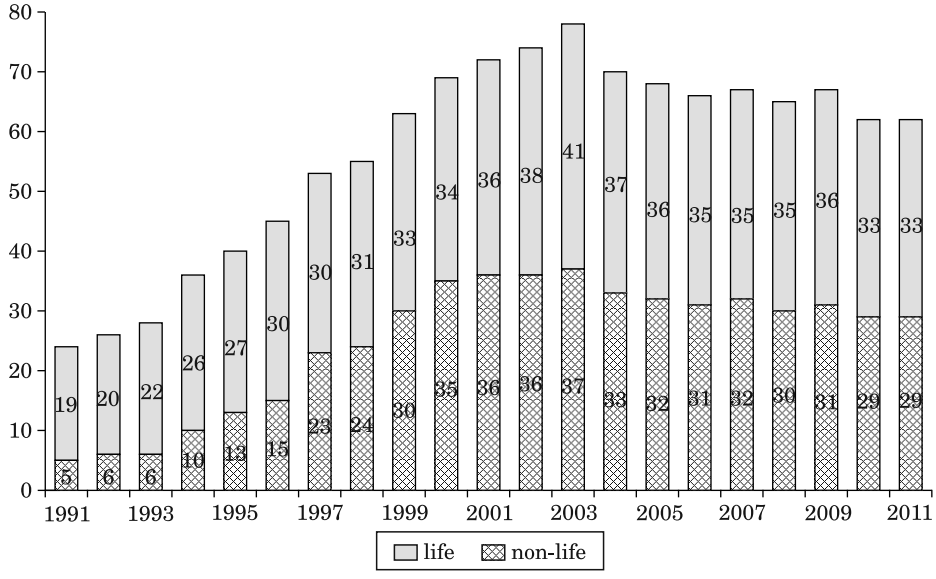

Fig. 2. Number of insurance companies in Poland during the years 1991–2011
Source: own work based on the Polish Financial Supervision Authority data, www.knf.gov.pl.

Table 1
Number of insurance companies in selected CEA countries during the years 2000–2010

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Austria	77	75	73	72	71	73	72	71	71	72	127
Croatia	27	24	23	24	24	25	20	23	25	27	26
Czech Rep.	41	43	42	42	40	45	49	52	53	53	53
France	527	504	495	486	475	486	477	464	461	452	441
Spain	423	414	401	393	379	362	354	357	296	294	292
Germany	659	640	645	640	633	632	613	609	607	604	582
Poland	69	72	74	78	70	68	66	67	65	67	63
Switzerland	144	142	143	141	143	143	143	143	148	150	151
United Kingdom	822	810	806	772	1,167	1,118	1,050	1,017	972	934	1,314
CEA	5,256	5,156	5,177	5,082	5,399	5,314	5,208	5,217	5,108	5,029	5,080

Source: CEA Statistics No. 40, *European Insurance in Figures. Data 1999–2008*, July 2010; CEA Statistics No. 44, *European Insurance in Figures.* December 2011, p. 48.

Comparing the situation of Poland to other selected CEA member countries, the different numbers of insurance companies can be observed (Tab. 1). In Poland, during the years 2000–2010, the number of insurance companies decreased by ca. 9%. In Austria, until the end of 2009, the number of insurers was at a very similar level of 71–73. A big change was observed in 2010 when

the number of companies increased by 65%. Also in the Czech Republic and Switzerland, the dynamics of the number of insurance companies in 2010 as compared to 2000 was 129% and 105%, respectively. On the other hand, the number of insurance companies decreased in Croatia (by 4%), France (by 16%), Spain (by 31%) and Germany (by 12%) and as the average for the CEA member countries (by 3%). On the other hand, in the United Kingdom a significant increase in the number of insurers (by 60%) was recorded during that period.

Comparing the number of insurers offering insurance services during the late 1990s with the situation during the last decade, it can be seen that during the last decade the number of companies decreased by ca. 300 insurers. This resulted from consolidation of capital: mergers and acquisitions highly influenced by the process of the European Union insurance market liberalisation and deregulation (*Polski rynek ubezpieczeniowy 2004–2008* 2009, p. 83). New companies that were established in, e.g. the United Kingdom and Austria, should also be mentioned.

Analysing the situation of the CEA countries as concerns the number of insurance companies (Fig. 3), the United Kingdom is the definite leader with a 25% share followed by Germany (11%), France (8%), Sweden (7%) and Spain (6%).

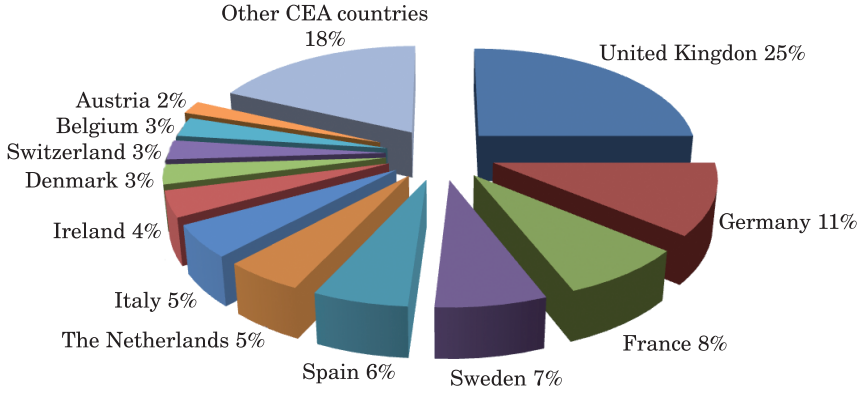

Fig. 3. Structure of the insurance companies by the CEA country in 2010
Source: CEA Statistic No. 44, *European Insurance in Figure*, December 2011, p. 31.

Comparing the number of insurance companies to the population of a given country (Tab. 2) it was noticed that among the countries analysed, Poland is characterised by the lowest ratio, i.e. 1.65 in 2010. This means that there were fewer than two insurance companies per 100,000 Poles. The situation was much more favourable in the Czech Republic, Croatia, Spain, France and Germany, while that ratio in Austria was 15, in Switzerland over

Table 2
Number of insurers per 100,000 citizens during the years 2000–2010 in the selected CEA countries

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Austria	9.61	9.33	9.03	8.87	8.69	8.87	8.71	8.55	8.52	8.60	15.11
Croatia	6.04	5.40	5.18	5.40	5.40	5.63	4.50	5.18	5.64	6.10	5.89
Czech Rep.	3.99	4.20	4.12	4.11	3.92	4.40	4.77	5.03	5.08	5.04	5.03
France	8.67	8.24	8.03	7.83	7.60	7.71	7.52	7.27	7.18	6.98	6.78
Spain	10.51	10.17	9.71	9.36	8.88	8.34	8.02	7.95	6.50	6.39	6.33
Germany	8.02	7.77	7.82	7.75	7.67	7.66	7.44	7.40	7.39	7.38	7.12
Poland	1.79	1.88	1.94	2.04	1.83	1.78	1.73	1.76	1.70	1.76	1.65
Switzerland	20.04	19.64	19.63	19.21	19.35	19.23	19.11	18.94	19.35	19.27	19.19
United Kingdom	13.96	13.70	13.59	12.96	19.49	18.56	17.32	16.67	15.84	15.06	21.05
CEA	9.27	9.10	9.09	8.87	9.37	9.17	9.00	8.96	8.73	8.56	8.60

Source: own work based on: CEA Statistics No. 40, *European Insurance in Figures. Data 1999–2008*, July 2010; CEA Statistic No. 44, *European Insurance in Figure*, December 2011, p. 53.

19 and in the United Kingdom it was 21. In Poland, the highest value of this indicator was recorded in 2010 when it was 2.04, while the lowest value was recorded in 2010.

The gross premiums written by insurers forms the basis of data on the activity of insurance companies in a given market and the strength of their influence on clients. In comparing 2010 to 2000, it can be seen that in the Czech Republic the premium increased by 239%, followed by Poland with 161% and Croatia with 114%. Only in the United Kingdom was a decrease recorded in the premiums written (by -18%). In comparing 2010 with 2009, the largest increase was recorded in Poland (14%), followed by the Czech Republic (13.5%). In Spain and Croatia, the premiums decreased by -6% and -1%, respectively. The Polish market was stable in comparison with the other countries and the average year premium rate of return was over 9%. If such a rate is maintained, in around 20 years the Polish insurance market could be among the European leaders (*Ubezpieczenia* 2010, pp. 12, 42).

In global research, confirmation of the assumption that "the insurance market development is dependent directly proportional to the economic situation" can be found. Deriving the coefficients from the gross domestic product is a good measure for evaluation of this development (SANGOWSKI 2002, p. 196).

The penetration coefficient describes the share of the gross premiums written in the gross domestic product. In Poland, until 2008, that coefficient increased from the level of 2.8 in 2000 to 4.6 in 2008 (Tab. 4). During the two following years, the penetration coefficient in Poland was at the level of 3.8, which reflects the influence of the financial crisis on the Polish market. Only in

Table 3

Gross premiums written during the years 2000–2010 in selected CEA countries (in EUR billion)

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Austria	11,679	12,470	12,615	13,128	13,974	15,295	15,589	15,874	16,214	16,415	16,748
Croatia	593	682	753	801	884	993	1,118	1,235	1,341	1,284	1,268
Czech Rep.	1,719	2,010	2,548	2,837	3,332	3,709	4,099	4,525	5,274	5,130	5,824
France	131,335	128,059	131,998	142,028	158,226	175,884	197,092	195,732	183,194	199,640	206,579
Spain	40,851	41,015	48,061	40,630	45,418	48,779	52,836	54,297	60,086	61,194	57,230
Germany	131,335	135,093	141,008	147,729	152,166	157,984	161,945	162,923	164,523	171,416	178,854
Poland	5,199	6,095	6,006	5,646	6,091	7,717	9,631	11,580	16,830	11,863	13,559
Switzerland	30,377	33,603	36,151	33,907	32,816	32,658	31,352	30,132	33,666	35,508	39,897
United Kingdom	252,689	228,691	255,226	236,746	246,212	266,587	294,269	366,572	247,022	203,878	206,906
CEA	814,961	805,756	872,469	884,815	936,034	1,015,646	1,100,908	1,181,806	1,059,113	1,059,674	1,104,221

Source: own work based on: CEA Statistics No. 40, *European Insurance in Figures. Data 1999–2008*, July 2010; CEA Statistic No. 44, *European Insurance in Figure*, December 2011, p. 36.

the United Kingdom did the penetration coefficient decrease over the last three years, while in Croatia it remained at the same level (2.8). Comparing the level of this coefficient of 2010 to the level of 2000, it can be seen that the share of expenditures on insurance in the GDP decreased in Spain (-17%), Switzerland (-11%), the United Kingdom (-22%) and on average for all the CEA countries (-1%).

Table 4

Penetration coefficient during the years 2000–2010 in selected CEA countries (in %)

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Austria	5.6	5.9	5.8	5.9	6.0	6.3	6.1	5.8	5.7	6.0	5.9
Croatia	2.6	2.7	2.7	2.7	2.7	2.8	2.9	2.9	2.8	2.8	2.8
Czech Rep.	2.8	2.9	3.2	3.5	3.8	3.7	3.6	3.5	3.5	3.7	4.0
France	9.1	8.6	8.5	8.9	9.5	10.2	10.9	10.3	9.4	10.5	10.8
Spain	6.5	6.0	6.6	5.2	5.4	5.4	5.4	5.2	5.4	5.7	5.4
Germany	6.4	6.4	6.6	6.8	6.9	7.0	7.0	6.7	6.6	7.2	7.2
Poland	2.8	2.9	2.9	2.9	3.0	3.2	3.5	3.7	4.6	3.8	3.8
Switzerland	11.2	11.8	12.2	11.8	11.2	10.9	10.1	9.5	9.8	10.0	10.0
United Kingdom	15.8	13.9	14.9	14.4	13.9	14.5	15.1	17.9	13.6	13.1	12.4
CEA	8.2	7.8	8.1	8.1	8.2	8.4	8.6	8.7	7.7	8.2	8.1

Source: own work based on: *Word insurance in 2010. Premiums back to growth – capital increases*, Swiss Re Sigma No. 2/2011, p. 39; CEA Statistic No. 44, *European Insurance in Figure*, December 2011, p. 24.

Table 5

Density coefficient during the years 2000–2010 in selected CEA countries (in EUR)

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Austria	1,458	1,550	1,561	1,617	1,710	1,857	1,882	1,909	1,945	1,961	2000
Croatia	134	153	169	180	199	224	252	278	302	289	260
Czech Rep.	167	197	250	278	326	362	399	430	498	491	582
France	2,161	2,092	2,141	2,288	2,530	2,792	3,107	3,067	2,854	3,093	3,220
Spain	1,015	1,007	1,163	967	1,064	1,124	1,198	1,210	1,301	1,299	1,260
Germany	1,598	1,641	1,710	1,790	1,844	1,916	1,966	1,984	2,004	2,089	2,230
Poland	136	159	157	148	160	202	253	304	441	311	410
Switzerland	4,230	4,650	4,959	4,620	4,472	4,391	4,189	3,990	4,385	4,613	5,180
United Kingdom	4,156	3,734	4,139	3,813	3,935	4,230	4,639	5,742	3,847	3,316	3,300
CEA	1,502	1,476	1,529	1,542	1,622	1,750	1,887	2,015	1,798	1,797	1,810

Source: own work based on the: CEA Statistic No. 44, *European Insurance in Figure*, December 2011, p. 20.

The density coefficient also says a lot about the insurance market development. It represents the amount of gross premium written each year per capita in a given country (SANGOWSKI 2002, p. 197). In Poland, the dynamics of the

density coefficient (Tab. 5) during the years covered increased by 300%. It was higher only in the Czech Republic (348%). A large increase of that coefficient was recorded also in Croatia (94%), France (49%) and Austria (37%), while in the United Kingdom the decrease of the density coefficient by 21% was recorded. For the CEA countries, this coefficient in 2010 was EUR 1,910 – meaning that the average citizen in CEA countries spent over PLN 7,600 for insurance per year.

The share of the analysed countries in the global market in 2010 was determined on the basis of the gross premium written. The European insurance market is very important in the global market. Its share is 37.35% (Tab. 6). Of the 9 European countries analysed, three are among the leaders of the global market: the United Kingdom ranking 3rd, France ranking 4th and Germany ranking 5th. The share of Poland in the global market is 0.41%, ranking Poland as 30th in the global insurance market. In 2000, the Polish market had a 0.2% share in the global market, ranking it 32nd (SANGOWSKI 2002, p. 198).

Table 6

Share in the global market

Country	Share in the global market in 2010	Position in the global market
Austria	0.51	26
Croatia	0.04	56
Czech Rep.	0.18	42
France	6.46	4
Spain	1.75	13
Germany	5.53	5
Poland	0.41	30
Switzerland	1.20	17
United Kingdom	7.15	3
Europe	37.35	–

Source: own work based on: *World insurance in 2010. Premiums back to growth – capital increases*, Swiss Re Sigma, No. 2/2011, p. 33.

Conclusion

To summarize, it is clear that the number of insurers in Poland is still small in relation to the markets of other European countries. There are fewer than 2 insurance companies per 100,000 citizens, while the average for the CEA countries is 8.6, although the market is quite stable in this regard. The penetration coefficient in Poland in 2010 was lower than for the CEA countries by 53%. The same situation concerns the density coefficient. A Pole spends

77% less on insurance than the average citizen of the CEA countries. In comparing the status of the Polish insurance market to the European Union insurance market, particularly the countries of Western Europe, the conclusion can be drawn that its importance is disproportionally lower, although the potential exists for further development of the Polish insurance market.

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ALGORITHM OF CALCULATING THE ANNUAL ECONOMIC EFFECT FROM IMPLEMENTING DIFFERENT TYPES OF INNOVATION IN A BUSINESS ORGANIZATION

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K e y w o r d s. Innovation, economic effect, cost of production, savings of resources.

A b s t r a c t

The goal of this article is the development of a commonly acceptable algorithm of calculating the economic effect from introducing innovations in a business organization. The article uses the method of absolute economic efficiency. It results in a number of suggested formulas for calculating the annual economic effect obtained by a reduction of manufacturing costs, increases in sales, savings of labour, material and financial resources both in manufacturing and non-manufacturing business areas, utilization of production waste as well as a reduction of manufacturing defects.

ALGORYTM OBLICZANIA ROCZNEGO WPŁYWU EKONOMICZNEGO WDRAŻANIA RÓŻNYCH TYPÓW INNOWACJI W ORGANIZACJI GOSPODARCZEJ

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S ł o w a k l u c z o w e: innowacja, efekt ekonomiczny, koszt produkcji, oszczędności zasobów.

A b s t r a k t

Celem artykułu jest opracowanie powszechnie akceptowalnego algorytmu obliczania efektu ekonomicznego wdrażania innowacji w organizacji gospodarczej. W artykule wykorzystano metodę absolutnej sprawności ekonomicznej. Zasugerowano kilka wzorów do obliczania rocznego efektu ekonomicznego uzyskiwanego na skutek obniżenia kosztów produkcji, wzrostu sprzedaży, oszczędności w zakresie kosztów siły roboczej, materiałów oraz zasobów finansowych, zarówno w obszarach produkcyjnych, jak i nieprodukcyjnych działalności, wykorzystania odpadów produkcyjnych, a także zmniejszenia liczby wad produkcyjnych.

Introduction

One of the key priorities of the development strategy of the Republic of Moldova is economic growth based on the balanced development of the national economy, gradual substitution of the energy resource component of the national GDP by a high-tech export production component based on effective utilization of scientific, technological and human potential of the country. Economic growth is quite feasible, yet it is possible only due to intensive technical and technological renewal of the manufacturing process and implementation of an innovative development model in the national economy.

The applicability of researching the problems of innovative economies is undoubted, although the development of modern information systems in Moldova has only just begun. We can observe the gradual formation of new innovative structures which are able to create new commercially attractive projects financed by successful companies involved in the realization of unique innovative programs.

The notion of "innovation" or "novelty" implies the production of new goods and services of higher quality, growth of production efficiency, improvement of work conditions, reduction of material and energy resources used per unit of manufactured goods, reduction of the ecological consequences of manufacturing and other business activities as well as other factors (RAIZBERG et al. 2005, p. 151).

Because the implementation of innovation in a business organization can provide a number of both positive and negative results, the effect of innovation can be measured by its added value which represents economic, social, ecological, informational and other useful effects. It is computed as the difference between the benefits of value-adding effects from an innovative approach and its implementation costs, considering the possibility of certain negative outcomes (FATKHUTDINOV 2003, pp. 397–399).

A single generalizing factor of economic efficiency of any innovation is the *economic effect* which describes the absolute value of the difference between the revenues and the costs from the application of a particular type of innovation within a predetermined period of time, usually one calendar year. The value of an economic effect is measured in two forms: macroeconomic and internal. The existence of a macroeconomic effect from a particular technological, organizational, breeding or other type of innovation does not always imply the appropriateness of its use in a business organization. That is why each firm always has to focus, not as much on the value of the entire macroeconomic effect, but on its share received by each participant of the innovation process. In other words, it is necessary to compute the internal economic effect of an applied innovation (VYVARETS 2007, pp. 215–221).

The methodology of calculating the efficiency of innovation in business organizations is extensively discussed in the works of Prokopivny, Greschak, Vyvarets, Ivaschenko, Fathoutdinov and others. The algorithm of calculating economic efficiency, for instance, for technological innovations, stipulates a comparison between the total generated revenues and total costs incurred (POKROPIVNY 2003, pp. 250–252).

The entire diversity of organizational, technological and other types of innovation covers a number of engineering, organizational and technological solutions implemented in the manufacturing process. These solutions usually value manufacturing efficiency in terms of a potential economic effect. Besides this, the efficiency of innovation is often evaluated analogously with investment- and innovation-driven projects on the basis of net discounted cash flows, return on invested capital and other measures which might not always reflect directly the value of a particular type of innovation implemented in a business organization.

The process of creation and assimilation of new goods and services, implementation of modern technologies and progressive methods of labour organization and manufacturing processes needs the development of a scientifically-based, commonly available methodical approach for evaluating a certain type of innovation (novelty) in the manufacturing process of a business organization.

In order to identify the most typical approaches of evaluating the efficiency of different types of innovation, an algorithm is suggested (RAIZBERG et al. 2005, p. 20) to calculate the annual economic effect from implemented types of innovation in the Republic of Moldova which can be used for the following purposes (PARMACLI 2003, p. 5–6):

– Technical and economic explanation for choosing the best options for creation and implementation of new equipment and technology;

– Reflection of efficiency measures in the accepted norms and parameters of an organization's business plans;

– Pricing of specific products as well as purchases and sales of technical documentation;

– Calculation of compensation to the authors of innovative approaches (novelties in a business organization);

– Possible resolution of certain litigations;

– Award of honourable titles to the authors of different types of innovations;

– Reporting to the statistical authorities about the implementation of any type of innovation.

The process of innovation consists of two major parts (GERCHIKOVA 1995, pp. 306–308):

– Creation of innovation which covers the period from early research and development to the starting date of its actual use;

– Implementation of innovation, *i*.e. the year during which positive results from the use of an innovative product or service are obtained and economic and other effects are determined.

In order to calculate the full economic effect on a business organization, methods of both comparative and absolute efficiency can be used. The method of comparative efficiency requires a computation of the actual results: the total cost of production, sales revenue, losses incurred by transferring manufacturing to another product, benefits of rationalization of labour resources, both in the manufacturing and in the exploitation areas.

In this case, the annual economic effect received by a firm as a result of the use of a novelty or a product with its application consists of:

– Increases in the business organization's revenues, gross margins and net profits (SHMALEN 1996, pp. 457–459);

– Reduction of production costs through savings or a more efficient use of available resources;

– Increases in revenues based both on a higher product price and a higher quantity of units sold;

– Other parameters (IVASCHENKO 2007, pp. 374–377).

If an implemented novelty has an analogue – *i*.e. a basis for comparison – then the relative economic efficiency is calculated. For this purpose, a comparative analysis of commensurable technical and economic parameters is conducted and the economic advantages of an implemented novelty are determined. If there is no comparison basis within the business organization itself, an analogue in another organization can be selected.

It is important to emphasize that according to the law "On Rationalization Activities" of the Republic of Moldova (2001), not less than 15% of the monetary value of an annual economic effect has to be directed to the author(s) of the innovative approach contributing to the effect and the remaining 85% should be retained by the business organization as a profit.

Algorithm of calculating the annual economic effect from reduced costs of production

The annual economic effect achieved by implementing particular types of innovation directed toward an increase in labour productivity, savings and efficient use of labour as well as material and financial resources related to production activities, and eventually reduction of the costs of production can be computed as (PARMACLI 2003, pp. 25–26):

$$E = \sum_{i=1}^{k} \Delta C_i S_i^n = \sum_{i=1}^{k} (C_i^b - C_i^n) S_i^n \quad (1)$$

where:

ΔC_i – represents the reduction of production costs per unit of product i;

S_i^n – is the amount of product i produced within one fiscal year;

C_i^b and C_i^n – are the costs per unit of a basic (known) product and a new (innovative) product i respectively;

k – is the number of new types of products.

Algorithm of calculating the annual economic effect as a factor of the rate of net sales growth

A higher volume of product units sold and, accordingly, sales revenues can be achieved by implementing the types of innovation associated with an increase in:

– Sales price due to improved quality parameters of new products and to mastered marketing, operating and other activities;

– Number of product units sold due to mastered marketing and other activities.

The annual economic effect expressed as an increase in the sales volume during a fiscal year due to the sale of new, higher-quality types of manufacturing and mastered marketing and other activities can be determined by the formula (PARMACLI 2003, pp. 27–28):

$$\Delta P = \sum_{i=1}^{k} (P_i^n - P_i^b) S_i^n \quad (2)$$

where:

P_i^n and P_i^b – are prices per unit of a new (innovative) and basic (known) product i respectively;

S_i^n – is the unit volume of sales of the new product i within a fiscal year.

The revenue increase from sales due to the implementation of a novelty which provides an additional amount of sales is:

$$\Delta P = \sum_{i=1}^{k} (P_i^b - C_i^b) S_i \quad (3)$$

where:

S_i – is the additional amount of sales of product i within a fiscal year.

Algorithm of calculating the annual economic effect from the savings of resources

Creation and implementation of a number of types of innovation can result from the savings of labour, material and financial resources both in the manufacturing and non-manufacturing-oriented business areas.

The use of innovative approaches in product manufacturing and service provision can yield two types of results:

– Savings are linked directly to production and sales, but they require only specific types of resources, for instance, raw materials, fuel, semi-finished goods, containers and others;

– Savings are not directly linked to manufacturing and sales, but they indirectly affect production costs, such as heating and illumination expenses for offices, facility departments and others.

In this case, there is no necessity for calculating the annual economic effect by comparing production costs and revenues based on formula (1). It is enough to calculate the value of saved resources.

Implementing innovation in a non-manufacturing unit of a business organization, e.g. by reducing the staff size or electricity expenditures at a socially-beneficial entity such as a sanatorium for factory employees, does not have a substantial impact on the total costs of production. Based on this rationale, calculation of the annual economic effect boils down to estimating the total value of saved resources.

The volume of saved material resources due to implementation of an innovative proposal within a fiscal year can be estimated by the following formula (PARMACLI 2003, pp. 29–32):

$$E = \sum_{i=1}^{k} (P_i + t_i)(m_i^b - m_i^n) S_i^n \tag{4}$$

where:

P_i – is the production cost per unit of resource i;
t_i – is the transportation or other type of expenditures connected to the purchase of resource i;
m_i^b and m_i^n – are the expenditures of material resources of type i per unit of basis and new production;
S_i^n – is the volume of production and sales of the new product i;
k – is the number of types of saved material resources due to the implementation of an innovative tool.

If the new technical solution is directed toward the savings of resources not associated with the firm's product, the calculation of the annual economic effect is recommended to be carried out by the following equation:

$$E = \sum_{i=1}^{k} (P_i + t_i) R_i \tag{5}$$

where:
R_i – is the volume of the saved resource i.

Accordingly, annual savings associated with employee termination could be expressed by the formula:

$$E = \sum_{i=1}^{k} (A_i, f + m_i + k_i) N_i \tag{6}$$

where:
A_i – is the annual salary fund of a terminated employee of category i, which includes bonuses, vacation payments, etc.
f – is the coefficient which takes into consideration the retirement plan and medical insurance contribution;
m_i – is the annual payment to the local municipal budget and other taxes paid by the business organization for each employee;
k_i – are the expenditures associated with the financial support of a terminated employee, labour safety and other expenditures per employee of category i;
N_i – is the number of terminated employees of category i.

Algorithm of calculating the annual economic effect from utilization of production waste

Production waste can be utilized by its finalization, recycling or use as an input manufacturing component of new products. In all cases, annual economic effect is suggested to be computed by the following formula:

$$E = \sum_{i=1}^{k} (P_i - P_i^r - C_i^r) S_i^n \tag{7}$$

where:
P_i – is the sales price per unit of new product i manufactured from production waste;

P_i^r – is the sales price of production waste used for the manufacturing of one unit of new product i;
S_i^r – are additional expenditures associated with the manufacturing of one unit of the new product i;
S_i^n – is the volume of manufactured and sold product i;
k – is the number of types of new products manufactured from production waste.

Production waste can also be used in accordance with a new suggestion without finalization or recycling. It might be optimal to calculate the annual economic effect using the equation:

$$E = \sum_{i=1}^{k} (P_i - P_i^r) R_i \tag{8}$$

where:
R_i – is the volume of the realized (sold) production waste of type i.

Algorithm of calculating the annual economic effect from lower production defects

An increase in production yield can be achieved due to the mastering of the technological process of manufacturing, improvement of employee education and skills, implementation of unique techniques and labour methods and other factors as well as due to the finalization (completion) of defective product units.

Calculation of the annual economic effect attained due to the reduction of production defects can be carried out by the following formula (PARMACLI 2003, pp. 33–35):

$$E = \sum_{i=1}^{k} (P_i - C_i) S_i \tag{9}$$

where:
P_i – is the sales price per unit of product i obtained by the finalization of defects of other techniques which can increase the production yield;
S_i – is the additional expense for finalization of one unit of defected product i or the prevention of defects;
S_i – is the unit volume of new product i obtained due to the reduction of production defects.

Conclusion

Creation and implementation of new equipment, inventions and innovative propositions are determined by the strategy of each business organization individually, the organization;s financial capabilities and precision of commercial projections. The suggested algorithm will allow calculating the economic effect from implementing different types of innovation in a business organization quickly, objectively and fairly precisely and will create favourable conditions for spurring innovators; interest in solving important manufacturing problems.

According to the National Bureau of Statistics of the Republic of Moldova, within the past ten years (2002–2011) each leu[1] invested in innovation and rationalization of the manufacturing process returned 2.3 lei on average per annum. In which other area of business is it possible to identify such a high return on invested capital? Within the specified period, the economic effect from implementing one invention or innovative product, service or approach in a business organization averaged approximately 10.9 thousand Moldovan Lei and from implementing one innovative proposal – at 9.7 thousand Moldovan Lei, accordingly. It is important to note that a number of innovative approaches and products also carry a socially-beneficial effect rather than only economic benefits, which pushes the value of implemented novelties even higher. As the statistics data reveal, business organizations have been able to generate annually an average of 1.8 million Moldovan Leiper through implementation of innovative approaches or products and 1.9 million Moldovan Lei per implemented innovative proposal (Statistical Yearbook of the Republic of Moldova, 2011).

The suggested algorithm obviously does not cover all types of sources of efficiency and the entire diversity of all types of innovation, which leaves room for future academic research in this area. Specific characteristics of particular types of innovation further dictate the use of different innovative approaches applicable to each individual innovation characteristic.

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MODEL OF A REGIONAL BUSINESS CYCLE INDICATORFORTHE PROVINCE OF WARMIA AND MAZURY

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K e y w o r d s: indicator, business cycle, analysis, region.

A b s t r a c t

Business cycle analysis at the national level does not have to be consistent with the economic situation of its individual regions. Diversity in the structure and development dynamics of the individual regions isalso reflected in the range of sensitivity to business cycle changes. Anevaluation was conducted of the suitability of multi-dimensional comparative analysis methods to evaluate the business cycle in the economy on a regional basis based on the example of Warmia and Mazury.The economy of Warmia and Mazury and its sensitivity to macroeconomic disturbances was the subject of the analysis. The business cycle studies by region conducted in Poland are based on so-called "business cycle tests" which are characterised by a high level of subjectivism. They are based on the results of questionnaire-based surveys conducted among entrepreneurs and, as a consequence, it seems justified to build a business cycle indicator for the province of Warmia and Mazury based on "hard" economic data. The proposal of the business cycle indicator for the region of Warmia and Mazury is based on the key economic dimensions for the region. The currently applied methods for elimination of irregular fluctuations and location of turning points were used for designing it. The outcome of the above measures offers the possibility to present the value of the current and prognostic business cycle indicator for Warmia and Mazury with monthly frequency.

KONSTRUKCJA WSKAŹNIKA KONIUNKTURY DLA WOJEWÓDZTWA WARMIŃSKO-MAZURSKIEGO

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S ł o w a k l u c z o w e: wskaźnik, cykl koniunkturalny, analiza, region.

A b s t r a k t

Analiza koniunktury gospodarczej w skali całego kraju niekoniecznie musi być zbieżna z sytuacją gospodarczą poszczególnych jego regionów. Zróżnicowanie pod względem struktury i dynamiki rozwoju poszczególnych regionów ma swoje odzwierciedlenie również w zakresie wrażliwości na

wahania koniunkturalne. Celem artykułu jest ocena przydatności metod wielowymiarowej analizy porównawczej do oceny stanu koniunktury w gospodarce w ujęciu regionalnym na przykładzie Warmii i Mazur. Przedmiotem badań jest gospodarka Warmii i Mazur oraz jej podatność na zaburzenia makroekonomiczne. Realizowane w Polsce badania koniunktury w ujęciu regionalnym są oparte na tzw. testach koniunktury, które charakteryzują się znaczną dozą subiektywizmu. Bazują one na wynikach badań ankietowych, przeprowadzanych wśród przedsiębiorców. Wydaje się więc uzasadnione zbudowanie wskaźnika koniunktury dla województwa warmińsko-mazurskiego na podstawie tzw. twardych danych ekonomicznych. Propozycja wskaźnika koniunktury dla regionu Warmii i Mazur jest oparta na wartościach najważniejszych dla regionu wielkości ekonomicznych. Do jego konstrukcji wykorzystano stosowane obecnie metody eliminacji wahań nieregularnych oraz lokalizacji punktów zwrotnych. Efektem tych działań jest możliwość prezentacji wartości wskaźnika bieżącego i wyprzedzającego koniunktury Warmii i Mazur z miesięczną częstotliwością.

Introduction

Business cycles represent an inseparable component in the functioning of economies worldwide. It can be said that cyclicality is closely correlated with the process of socioeconomic development. Consequently, the issue of business cycles has become one of the most important problems in macroeconomics. Obtaining knowledge of the mechanisms of monetary shock transmission to the change in real values in the economy and possibly preventing (or at least mitigating) them has also become the focal point of attention within the framework of economic policy issues.

A review of the published business cycle indicators for the province of Warmia and Mazury was the primary goal of the paper. Presentation of the design of the business cycle indicator for the region of Warmia and Mazury was a secondary goal.

Business cycle indicators in literature

Business cycles represent a very complex phenomenon and there is no single theory allowing a clear separation of them from otherphenomena of a similar nature. In the literature, a diversity of actors that form the basis for economic fluctuations are indicated. Their mutual relations may be of an incidental nature or represent a consistent mechanism where the longer cycles consist of a defined number of shorter ones (BOBROWICZ 1999, p. 14).

The initial attempts at identification and description of the phenomenon of eneral economic fluctuations based on economic theories were undertaken at the end of the 19th c. W.S. Jevons and H.L. Moore linked the existence of economic cycles with the appearance of sunspots and weather cycles. That was the first attempt at defining the periodicity of the fluctuations, as the earlier views of the representatives of classic economy were limited to stating that any

disturbances in the economy were of an exogenous character and the market mechanisms causean automatic return to a state of equilibrium (LUBIŃSKI 2004, p. 78).

At the next stage of studies on the nature of economic development cyclicality, the focus was on explaining the cycles as individual, unrelated phenomena. The aim of the studies was to measure and describe, but not explain, the causes for the phenomenon discussed. On that basis, during the 1920s the institutions dealing with business cycle studies, such as the National Bureau of Economic Research (NBER) in the USA and the Institut Fur Konjunkturforschung (IFO) in Germany, were established.

Works by J. Juglar represent the turning point in studies of economic development cyclicality. He showed, on the basis of empirical analyses, that treating the phenomenon of fluctuations as being caused by external factors was misleading. Among the numerous theoretical concepts that were elaborated as a consequence of the studies by Juglar, one of the fundamental divisions in the theory of business cycle fluctuations into exogenous and endogenous fluctuations can be pointed at. Exogenous theories see the causes of economic fluctuations in external phenomena, independent of the economic mechanism. The endogenous theories, on the other hand, link fluctuations with the market economy functioning mechanism (LUBIŃSKI 2004, p. 78).

Representatives of the exogenous theory see the economic system as relatively stable, which when thrown out of balance eventually returns to it automatically. The reference within that group to the opinions of the classics also concerns the economic growth sources i.e. the technological progress, capital accumulation, population increase or discovery of new resources. Any disturbances resulting from technological changes or State intervention are coordinated by the market mechanism. After their withdrawal, the economy returns automatically to the path of rapid growth with full use of the factors of production.

The so-called theory of shocks presented by, *inter alia*, E. Slutzky and R. Frisch, was the extreme example of the influence of external stimuli on the economic relations which cause the business cycles. They point out that even combining absolutely random data sets may create an aggregate of a cyclical nature. According to Frisch, defining the factor that initiates the fluctuations of economic values is the key to understanding the business cycle phenomenon. He is the author of the so-called impulse proliferation model that divides the cycle progress into the external causes for initiation of the cyclic fluctuations and the causes of their continuation (HERBST 2003, p. 22).

Within the framework of the endogenous theories, it is highlighted that the economy itself is a system of internal instabilities. According to Keynes, the lack of balance between investments and savings can be a cause of instability.

The theory by Kalecki, on the other hand, is based on the assumption that instability is caused by fluctuations in orders for investment goods caused by changes in the profit rate. The inseparability of economic growth processes and cyclical fluctuations is a common characteristic of the endogenous theories.

In addition to the above-mentioned contribution of the Polish economist M. Kalecki in the development of endogenous business cycles theories, he is only mentioned in the subject literature as the precursor of the notion of the political business cycle. In the article published during 1940s, Kalecki linked economic instability with the government economic policy being subject to influences from various pressure groups. The repeating periods of crisis caused by extra-economic decisions of the central authorities are the outcome of such activities (LUBIŃSKI 2004, p. 98).

The concept of the electoral cycle known in the literature represents a continuation of the political cycle. According to this theory, winning and retaining the power is the goal of the political elites. In the democratic system, this is linked to a victory in the general election. Assuming that society assigns the highest value to its own material situation and the general condition of the economy, instrumental use of economic policy to achieve electoral success can be projected. In the political cycle model, the characteristic pattern of social behaviour is assumed. It involves taking electoral decisions on the basis of the most recent experiences. Additionally, it is assumed that the voters do not draw conclusions from either the negative or the positive experiences and their behaviours are repeatable. The ultimate decision of the electorate represents the victory of the current group, which ends the situation of uncertainty in the economy or the change of the governing group, which involves a change in the economic policy. In both cases, specific economic perturbations take place (LUBIŃSKI 2004, pp. 98–100, PIECH 2003, p. 59).

The monetarist concept formulated by M. Friedman is one of the contemporary business cycle theories. The statement that the level of monetary income in the society is determined by the increase of the monetary resources in the economy is thecore of this approach. An increase in the supply of money causes an interest rate decrease. This stimulates investments and, ultimately, the consumption demand. An increase in inflation is the ultimate outcome of this process. This means a decrease in the real supply of money and, as a consequence, annihilates the temporary production increase. An increase in prices, not production, is the only outcome of an expansive monetary policy in the long-term perspective (BARCZYK 1997, p. 132).

The theses by Friedman were developed by R. Lucas, who analysedthe conditions under which the monetary policy may be effective. The imperfect information available to the producers is seen as an important problem. Subjective evaluation of the changes in the prices of own products makes them

increase production. The consequences of this are an increase in employment and an increase in the nominal wages. The propensity to accept the monetary illusion causes an increase in employment and a decrease in unemployment. Only in the longer term does the revision of the actions taken by the business entities and employees occur. The belief in solely nominal changes, and not the actual ones, influences the limitation of production, decreases employment and increases unemployment. Similar to the changes in the supply of money, a return to the baseline situation, with the exception of an increase in prices, takes place as a result of the adjustment in all values. Lucas presents the position that the rigidness of wages is the cause for delays in matching the supply and demand in the market. Changes in the level of nominal wages as a consequence of incomplete information available to the employees on the prices do not translate into changes in wages in the real categories. Higher wage demands during consecutive periods influencing the unemployment rate are the outcome. The repeatability of the sequence of the above events causes that the actions by the government concerning, e.g. changes in money supply, become predictable. This means that predictable changes in the supply of money result in changes in prices, but not in production. The statement that changes in the supply of money at a faster rate than expected by business entities may influence economic revival is the final conclusion by Lucas. He also formulated a thesis on the ineffectiveness of monetary policy as a tool for stimulating economic growth (HALL, TAYLOR 2007, p. 404).

As a consequence of insufficient explanation of causes for the business cycle fluctuations occurring during 1970s in the global economy, J. Tobin formulated the thesis on technological changes and changes in consumer tastes as the main causes for a collapse in the growth dynamics. In 1982, F. Kydland and E. Prescott presented a non-monetary model of equilibrium called the real business cycle (SNOWDON et al. 1998, pp. 248–252). The real cycle theory, in contrast to the monetarist concepts, attributes fundamental importance to real shocks, mainly on the supply side caused by changes in productivity. Supporters of the real cycle concept cite changes such as fluctuations in agricultural production, energy price fluctuations, wars, political coups, economic policy changes and technological shocks caused by changes in the quality of labour and capital outlays (LUBIŃSKI 2004, p. 106). Changes in the technological progress rate represent the most important factor of changes in the economy according to the real business cycle supporters. According to them, they are consistent with the development of business cycle fluctuations. However, the critics of this approach cite the difficulties with proving a cause and effect relation between the discussed values (SNOWDON et al. 1998, p. 276). It is generally concluded that the real business cycle theory provides imprecise explanations of changes in some economic values observed during the business

cycle. The reference to microeconomics in explaining the behaviours of business entities is an advantage of this theory.

The majority of theoretical analyses aim at proving the similarity between the regional and national economic fluctuations. Some researchers show that the business cycle development in a national scale is the sum of the business cycle changes in individual regions. On the other hand, such an aggregated approach to business cycle analysis may eliminate certain characteristic features of the individual regions of the country from the analysis and,consequently, limit the status of knowledge on the characteristics of the business cycle fluctuations in the regional approach. CARLINO and SILL (2001, p. 69) showed, on the basis of cyclic changes in the dynamics of real incomes, that strong divergence in the business cycle development exists between the regional and national cycles. The literature also presents indicators testing the correlation indicator for the components of the economies of individual regions (CRONE 2005, p. 148).

In the countries of Central and Eastern Europe that have a GDP structure similar to highly-developed countries, the situation in the construction industry is relatively important for the general status of the business cycle. This is understandable because the increase in demand in that sector of the economy results in further investments contributing the same amount to the economic growth acceleration. The cycles related to construction are known in the literature as Kuznetz cycles and have an average length of 20 years (See: SOLOMOU 1998, p. 84).

Precise determination of the turning points and, as a consequence, the business cycle phases, represents one of the most difficult stages on the business cycle analysis. This is the consequence of the multiplicity of methods using different techniques for determination of those elements. The literature identifies three major concepts for business cycle fluctuation identification:

– the classic business cycle concept based on studying the fluctuations in absolute values of economic indicators;

– cycle deviation concept according to which the growth path deviation from the long-term trend is measured;

– the growth cycle concept involving economic growth rate change analysis without defining which part of those changes results from the growth process and which is a consequence of the business cycle.

The growth cycles were assumed as the basis for analyses in this study. This method allows identification of business cycles even when a long period of uninterrupted growth takes place. In this case, analysis of absolute values does not offer clear results.

Business cycle survey according to the regional approach

Studying the business cycle according to the regional approach in Poland represents a relatively new issue. The Poznań University of Economics was the first centres that started such studies during the 1980s. However, as a consequence of the subject scope, those studies cannot be considered comprehensive[1]. During 1990s the above-mentioned scientific centre also developed the business cycle indicator for the province of Wielkopolskie but activities in that field have not been continued.

The business cycle analysis conducted by the Central Statistical Office in Poland in 1992 did not consider regional aspects. Although partial business cycle studies are conducted at the provincial level, they serve the purpose of aggregation and processing of questionnaire-based studies at the national level[2].

Research institutes in Poland, such as Pentor of GFK Polonia, conduct limited studies on the Polish economic situation. The GFK Polonia institute conducts only fragmentary surveys concerning the structure of demand, marketing preference of customers or branch management (http://www.gfk.pl/sectors_and_markets/custom_research/index.pl.html). In the case of the Pentor institute, it monitors the situation in the banking market on a monthly basis and measures economic sentiment among consumers. These surveys, however, encompass the entire country and they do not consider, e.g. the differences in the per capita GDP, wages or the economic structure of the region (http://www.pentor.pl).

The Gdańsk Institute for Market Economics, as of January 2001, has conducted a survey of the business cycle in the province. The survey is conducted by means of the business cycle test method involving a monthly questionnaire-based check covering a selected group of business entities. The respondents answer questions concerning their impressions related to the general economic situation in the province and questions concerning the situation of their businesses. The questions concern, *inter alia*, the level of production, sales and employment. The complementary questions concern the

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[1] The studies conducted by the Poznan University of Economics covered two areas: industry and construction.

[2] Performance of fragmentary studies of the economic market cycle at the provincial level by the Central Statistical Office is based on the chosen methodology, i.e. stratified random sampling without replacement and proportional tothe test sample size.A layer is defined as a simultaneous grouping according to the chapter, group and class of the Polish Classification of Activity and size class (small, medium, large). The source for generating the files for the studies is provided by the Database of Statistical Units. Update of the sample is conducted once a year. www.stat.gov.pl/cps/.../PUBL_badanie_koniunktury_gospodarczej_v3.pdf

expectations of the respondents as concerns the change in the situation in the nearest future (1–3 months). On the basis of the questionnaires collected, the Institute computes the business cycle indicator (current and forecasted data for the entire country and for each of the 16 provinces monthly) (http://www.ibngr.pl).

The University of Management and Administration in Zamość is also an institution that conducts business cycle studies on a regional scale. The surveys are conducted using the business cycle test methods and encompass the area of Lubelskie province.

The province of Warmia and Mazuryis a region witha low level of development in Poland. The dynamics of economic growth there are also relatively low. The per capita GDP in the province of Warmia and Mazury does not exceed 75% of the national value. The average wage level in the sector of enterprises is lower by 21% than the national average while the unemployment rate is usually almost twice higher than the national value. The regional economy has an agricultural-tourism profile. This that it is encumbered with the specificity of agricultural production fluctuations (overproduction, lack of price stability, strong dependence on changes in EU trade policy), on the one hand, while on the other, there is a developing tourism sector which encounters numerous difficulties, such as the absence of a well-developed network of roads, railways and airports and the absence of the appropriate tourism infrastructure (hotels, restaurants). The significant fluctuations in demand in tourism in Warmia and Mazury, resulting from the relatively short period of high economic activity in tourism and the period of standstill dominating the year, are also significant problems for tourism.

Table 1

Selected macroeconomic indicators for the province of Warmia and Mazury and Poland

Item	GDP per capita (in PLN million, 2009)		Unemployment rate in 2011		Average wage (in PLN, 2011)	
	absolute	Poland=100	absolute	Poland=100	absolute	Poland=100
POLAND	35,210	100	12.5	100	3,605	100
Warmia and Mazury	25,970	73.8	20.1	160.8	2,869	79.6

Source: http://www.stat.gov.pl/cps/rde/xbcr/gus/rn_pkb_rachunki_regionalne_w_2009.pdf; *Bezrobotni oraz stopa bezrobocia wg województw, podregionów i powiatów*, GUS, www.stat.gov.pl; *Komunikat o sytuacji społeczno-gospodarczej województwa warmińsko-mazurskiego*, WUS Olsztyn.

The so-called synthetic measures were used for quantification of the business cycle status in the province of Warmia and Mazury. They serve to define the development of a phenomenon which requires using a relatively

large number of characteristics with one number. Such phenomena that are multi-characteristic processes are observed for an object or for a group of objects, which, as a consequence, allows ranking the objects according to the development status (MALINA 2004, p. 38, STRAHL 1990, p. 46).

In this study, the evaluation of the business cycle status of the province of Warmia and Mazurybased on the most important indicators acting as component variables of the synthetic indicator was conducted by applying the discussed method. Evaluation of economic activity changes in the region of Warmia and Mazury during the period from January 2008 until May 2011 is the outcome of applying that method.

Aggregated data concerning the following economic macro-values was used for designing the synthetic business cycle index in the province of Warmia and Mazury:

– Consumer goods and services price index
– Number of the unemployed registered with the labour offices
– Number of job offers posted with the labour offices
– Dynamics of average wage in the sector of enterprises
– Dynamicsof construction-assembly production
– Dynamics of industrial production sold
– Dynamics of retail sales
– Number of building permits issued
– Number of tourists visiting the region
– Accommodation facilities use indicator
– Cereals purchase price index
– Cattle purchase price index
– Pigs purchase price index
– Value of the business climate index in the Euro zone

Three synthetic indicators of the moods of entrepreneurs and the banking sector climate were also used as complementary information on the business cycle status. These include:

– the current business cycle indicator (by IBnGR)
– the prognostic business cycle indicator (by IBnGR)
– the business cycle in the banking sector indicator (by Pengab)

All changes were considered with monthly intervals. Aiming at elimination of the effect of accrual of the increases in values of all the variables, they were converted to differences between the neighbouring periods using the synthetic increase formula by Shishkin. That operation aims at maintaining the synthetic nature of the positive and negative changes in the value of a given variable (HERBST 2003, p. 58).

Elimination of the component of seasonal character from the data of an empirical time series represents a subsequent step in designing a synthetic

business cycle indicator. The ARIMA procedure is the most popular method serving time series decomposition. This method uses the concept of a mobile average for estimation of the seasonal component value[3]. Given the fact that some values of variables were available already after decomposition, this procedure was employed only for some variables.

The aim of the next procedure was to divide the variables considered in the business cycle analysis into three categories: prognostic variables, simultaneous variables and delayed variables. This is important for determination of the nature of the component variable influence on the current business cycle status expressed by means of the synthetic indicator. The so-called reference series in most cases represented by the variable reflecting changes in employment or production volume is the reference point for the above-indicated categories. In this analysis, the value of industrial production sold was assumed for the reference series.

The variables were selected according to the criterion of division into the prognostic and simultaneous indicators in relation to the business cycle fluctuations using a correlation analysis and a test by means of the major components method[4].

The basis for the design of the simultaneous indicator design involved: the number of unemployed registered with the labour offices, the number of job offers posted with labour offices, the dynamics of the average wage in the sector of enterprises, dynamics of construction-assembly production, dynamics of the industrial production sold, the number of tourists visiting the region, accommodation facilities use indicator, dynamics of retail sales and the current business cycle indicator (by IBnGR). On the other hand, the following variables were classified as variables with prognostic properties in relation to the business cycle status: the number of building permits issued, the prognostic business cycle indicator (by IBnGR), an indicator determining the status of the economic climate and the climate indicator of the banking sector (Pengab).

Standardisation of component variables is the next step in the design of the synthetic business cycle indicator. The aim of that operation is to limit the influence of indicators showing high variability on the final values of the synthetic indicator (MALINA 2004).

Aggregation of component variables to form a composite index is the last step in designing the business cycle indicator. It is achieved, in most cases, by summing up the standardised increases of individual variables or by computing the average value of such increases.

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[3] The *ARIMA* procedure was implemented using the STATISTICA 8.0 software package.

[4] In the analysis of the business cycle for the province of Warmia and Mazury, the development of a synthetic delayed indicator was abandoned.

Defining the selection criterion for weights attributed to the individual components represents a separate issue to be solved at the final stage of the business cycle indicator computation. In computation of the synthetic business cycle, the strength of correlation with the reference series was assumed for the criterion of the share of the individual variables in the formation of its final value.

Analysis of the business cycle index components for the province of Warmia and Mazury[5]

Labour market

As of the end of December 2011, as compared to the end of the 3rdquarter of 2011, the number of unemployed in the province of Warmia and Mazury increased by 9,000 people. This was the fifth consecutive month during which an increase in the number of the unemployed was recorded compared to the preceding period. In comparison to September 2011, the number of unemployed increased by 1.3%. Ultimately, the number of unemployed in Warmia and Mazury as at the end of December 2011 was 107,300 people.

As of the end of December 2011, the unemployment rate in the province of Warmia and Mazury was 20.1% and was higher by 7.6 percentage points than the national average where the value of that indicator was 12.5%. This means that in the province of Warmia and Mazury, for every 100 professionally-active people there were 20 people that were unemployed, while the national average was 12 people, The unemployment rate for the province of Warmia and Mazury in December 2011 as compared to September increased by 1.4 percentage point while in the country that increase was by 0.7 percentage points. Compared to the equivalent period of the preceding year, the unemployment rate increased by 0.1 percent point (for the country it remained unchanged). Warmia and Mazury is the region where unemployment is still the highest in Poland.

During the analysed period, unemployment increased in nine counties of the province with the highest increases recorded in the counties of Nowe Miasto (by 9%), Iława (by 7.4%) and Olsztyn (by 5.7%). In twelve counties unemployment decreased by from 0.2% in Ełk county to 13.2% in Giżycko county.

In December 2011, 1,538 job offers were posted at the employment offices, which is fewer by 238 (13.5%) than in December 2010 and by 234 (13.3%) less than in November, 2011.

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[5] Prepared on the basis of: *Komunikat o sytuacjispołeczno-gospodarczejwojewództwawarmińsko-mazurskiego*, monthly publication, WUS Olsztyn.

Compared to the preceding year, the decrease was recorded in the:

– number of unsubsidised, i.e. originating from the free market job offers – by 18, i.e. by 1.4%;

– number of subsidised job offers – by 1,126, i.e. by 65.9%;

– number of vacant vocational activation places – by 1,454 i.e. by 79.4%.

In December 2011, the county labour offices in the province of Warmia and Mazury received 1 notice concerning the intent of dismissing 1 person. The notice concerned an enterprise operating in Działdowo county (industrial processing). From the beginning of the current year, the intent of group dismissals of employees was notified by 19 employers and the planned dismissals covered 926 persons. Within the earlier reported group dismissals, in December 2011, 41 persons lost jobs in the province of Warmia and Mazury, including:

– Section *National defence* – 32 persons in Elbląg county,

– Section *Wholesale and retail trade; repair of automotive vehicles, excluding motorcycles* – 8 persons in Olsztyn,

– Section *Education* – 1 person in Ostróda.

According to the status as at the end of December 2011, the extent of group dismissals was narrower than announced by the enterprises at the beginning of the year. However, as assessed by the Province Labour Office in Olsztyn, this does not have to mean an improvement in the situation in the labour market but may indicate the situation where employers, by spreading dismissals over time avoid the required consultations with the trade unions or representatives of the employees. It happens often that the enterprises hide the fact of group dismissals by spreading the decrease in employment over the period of a few months. Employers, when they want to dismiss employees according to the group redundancy formula, are required to notify the labour office about such intent. Dismissals were recorded, *inter alia*, at insurance companies, banks, logistics and postal service companies as well as employees of military units.

Almost a half of the unemployed (49.3%, i.e. 50,853 persons) in the province are residents in rural areas. As compared to the equivalent period of 2010 their number increased by 2,459 persons, i.e. by 5.1%, while the percentage share of this category of people in the total unemployment increased by 0.8 percentage points. The highest percentage share of the residents from rural areas in the total unemployment was recorded in the counties of Nowe Miasto (76.5%), Elbląg (73.8%) and Olsztyn (68.9%), while that share was the lowest in the counties of Ełk (37,4%), Giżycko (45,3%), and Lidzbark (43.9%).

Complete economic integration of Poland with the EU countries took place as a result of opening the labour markets by the last Member States in January 2011 (Germany, Austria, Switzerland). Nevertheless, as indicated by the

values of the labour market indicators, this did not result in perceptible changes as concerns changes in the regional labour market. Until the end of 2011, within the framework of the European Employment Service EURES, 69 employment offers were received (32 offers fewer than during the equivalent period of the preceding year), and from the beginning of the year – 1,935 offers were received (1,425 offers more than in December 2010). The majority of job offers obtained from January until November 2011 originated from the Netherlands (1,220 offers, i.e. 63.0%) and Germany (508, i.e. 26.3%), while the other jobs were offered first of all in Spain (148 offers, i.e. 7.6%), as well as Italy (17 offers, i.e. 0.9%) and the United Kingdom (15 offers, i.e. 0.8%).

As concerns the division of the offers into subsidised and unsubsidised ones, those later ones are more beneficial to the economy of the region because they originate from the free market and are not linked to any expectations from the employers.

The structure of job offers as compared to the equivalent period of 2010 changed in favour of unsubsidised employment. Currently such offers represent 50% of all vacant jobs and vocational activation,which is 21.9 percentage points more than during the period of January-November 2010. The percentage share of vacant vocational activation positions in the entire offer decreased significantly from 44.3% in 2010 to 28.8% in 2011 (change by 15.5 percentage points); the decrease in the number of subsidised employment was smaller (from 27.6% in 2010 to 21.2% in 2011, i.e. by 6.4 percentage points).

In December 2011, the county labour offices received 1,772 offers of vacancies and vocational activation positions, i.e. 934 fewer (34.5%) than at the end of 2010. As compared to the equivalent period of the preceding year:

– the number of unsubsidised job offers, i.e. those coming from the free market – increased by 220, i.e. 34.5%;

– the number of subsidised employment offers decreased by 529, i.e. 59.0%;

– the number of vacant vocational activation positions was lower by 625, i.e. 67.9%.

Analysing the trends in the labour market of Warmia and Mazury during the years 2005–2011 a decreasing trend in both the number of the unemployed and the number of job offers can be noticed. While the first conclusion is of a positive nature, the decrease in the number of newly-created jobs in the region may be a concern. That trend, however, has no economic background. This is the outcome of changes in the outlays of the Labour Fund for active forms of combating unemployment. As of 2011, compared to 2010, outlays on training were decreased by 80%, on scholarships during the period of internship by 60% and on vocational preparation of adults and youth by almost 30%. This limitation also applied to reimbursement of the costs of creating jobs and additional equipment of workstations offered to the employers and the

costs of starting business by the unemployed. In both cases, the budgets were cut down by over 80%. On the other hand, the funds for unemployment benefits and social aid increased, which will not support improvement in vocational activation of the unemployed.

The value of the average wage in the sector of enterprises in the province of Warmia and Mazury increased year-to-year by the end of December 2011 by 3.4%. Compared to November, the level of wages increased on average by 8.4%. At the same time, the dynamics of wages in the sector of enterprises in the whole country was 4.4% in year-to-year comparison while in comparison to the preceding month, the level of wages increased by 9%. The dynamics of wage changes in the region is thus lower than the changes of wages in the enterprises for the entire country. If we consider the inflation index, then the wages in the province of Warmia and Mazury in December were at the level of 12 months earlier. On the other hand, on the national scale, a small decrease in the real value of wages took place (by 0.2 percent point). It should be pointed out that the increase in wages analysed according to the month-to-month approach in the case of December may not be considered fully valid because in December employees usually receive additional financial benefits (yearly bonuses, seasonal bonuses) added to the wage. On the other hand, the conclusion can be formulated that the dynamics of wages at the end of 2011 according to the year-to-year approach reached a certain status of equilibrium. In December 2011,the average value of wages in the sector of enterprises in the province of Warmia and Mazury represented 79.3% of the equivalent wage nationally, which represents a result worse than the situation at the end of the 3rd quarter of 2011. The situation concerning wage changes was accompanied by a minor increase in the average employment in the sector of enterprises according to the year-to-year approach (by 2.3%). On the other hand, compared to the preceding month, December traditionally represents the end of seasonal work and expiration of civil-legal employment contracts. The consequence of that is the decrease in the average employment level in the sector of enterprises during the last month of the year as compared to November (by 0.2%). The slowdown in the wage increase rate to the level of inflation and the minor increase in employment indicate that entrepreneurs expect a decrease in the dynamics of demand for their products and are adjusting their costs to temporarily lower revenues during the coming year.

Industrial and construction-assembly production

Sold industrial production of the province of Warmia and Mazuryin current prices in December 2011 was higher by 11.4% than a year earlier and did not changecompared to the preceding month. At the same time, industrial

production in Poland increased in December 2011 by 7.7% as compared to the equivalent month of the preceding year. On the other hand, compared to the preceding month, the national production decreased by 4.9%. The above data indicate better market cycle results for Warmia and Mazury year-to-year as compared to the national indicators of sold industrial production. In the case of the dynamics for all of Poland,there was an improvement as compared to the same period of the preceding year but the rate of increased slowed. This means that in the situation of difficulties in the financial market (related to the situation in the Euro zone) the enterprises were continually performing the orders and contracts made during the first half of 2011, whichwas a period of a relatively better market situation. In the case of foreign contracts, the competitiveness of Polish exports was supported by a weak Polish zloty. However, facing the weakening demand in the Euro countries, and particularly in Germany, the prospects for changes in orders for industrial products for the nearest months are negative. Changes in the domestic demand for industrial products, in the context of, among others, higher inflation and a decrease in the real purchasing power of wages and unemployment increase will show a decreasing trend. It should be highlighted, nevertheless, that industry and construction are the sectors that led the GDP increase throughout 2011. This indicates the increasing competitiveness of Polish industry, not only in the domestic scale.

The economic results of the province of Warmia and Mazury are slightly worse compared to the equivalent period of the preceding year. The industrial production increase in Warmia and Mazury was lower year-to-year compared to the equivalent period of the preceding year. Although during the fourth quarter of the current year the dynamics of industrial production increase for the province of Warmia and Mazury decreased slightly as compared to the third quarter of 2011, in December 2011 it still showed a positive rate of change. Generally, from the beginning of 2011 the dynamics of industrial production exceeded on average the level of 10%, which should be considered a good result. Enterprises were completing contracts signed during the first half of the year and, in some industries such as furniture or timber production, a return to the traditional sales markets for those sectors took placefollowing a large decrease in production volumes in 2010. This was also the effect of the weakening Polish zloty as a result of debt problems in the Euro zone countries. In that context, changesin the situation in the EU countries, particularly Germany, will be of key importance for the further development of trends in the industrial market.

Volume of the construction-assembly production, encompassing works of investment and refurbishment nature attained in the province of Warmia and Mazury by construction enterprises employing more than 9 per-

sons was in December 2011 higher by 3.2% than a year earlier and higher by 51.2% compared to November 2011. Compared to the national results (increase by 4.2% compared to the preceding year and by 20.3% compared to the preceding month) the indicators characteristic for Warmia and Mazury indicate higher fluctuations, which results from the general situation of the regionhaving the highest unemployment rate in Poland. Despite the occurrence, as can be seen in the decreasing prices of residential units, of a certain surplus of supply, the increase in building permits granted is surprising. In December 2011, the county administration offices issued 478 building permits, i.e. 79 (19.9%) more than in November and 144 (13.2%) permits fewer than the equivalent period 12 months earlier. This may indicate the maintenance of good dynamics in the construction sector in 2012.

The results of the construction sector can be divided into two components. Infrastructure construction financed by the public sector is the first of them. In that field, both in the regional and the national approach,a relatively good market is "pulled" by large infrastructural projects co-financed from EU funds. This is the part of the construction sector that is not subject to the market cycle fluctuations. Private construction encompassing both individual construction and housing construction is the second component. In this case,thereis a correlation with the general economic situation as well as the influence of a government-implemented programme stimulating the demand through the real estate market "family on its own" programme. Construction has a particularly high sensitivity to changes in the situation in the credit market. In this context, a clear weakening of dynamics in that sector occurred following limitation of the credit offer of banks denominated in foreign currency and the implementation of more restrictive conditions for the origin of loans denominated in Polish zlotys. In the long-term perspective, limitation of the demand for credit will be the consequence of the government winding down the "family on its own" programme and probably higher margins of commercial banks for clients, which is linked to the losses incurred by the banking sector as a result of the restructuring of the public debt of Greece agreed by the Euro zone countries. In the case of the construction industry, an important role is played by infrastructural projects financed from the EU funds that increase dynamics and stabilise the demand in that market.

Internal and foreign demand

The dynamics of retail sales is an index measuring the value of retail sales for each month achieved by trade and non-trade enterprises. Changes in retail sales represent the fastest indicator of trends in the consumption expenditures

of society. The level of this indicator is the result of the situation in the labour market and the dynamics of the average wage in the economy.

Retail sales in the province of Warmia and Mazury in December 2011 were higher by 6.5% as compared to the equivalent month of the preceding year. The level of sales was higher than the value for the preceding month by 13.1%. Nationally, the retail sales increased in December 2011 by 4.2% according to the year-to-year approach, while a month-to-month change increase by 20.3% occurred. It should be generally concluded that during the period covered, the retail sales results for the country as the whole show higher stability in reaction to market fluctuations compared to the dynamics for the province of Warmia and Mazury. During the last crisis of 2009 when the province of Warmia and Mazuryrecorded several-percent decreases in sales year-to-year, nationally the year-to-year dynamics oscillated within 100% of the previous year's value. Despite the visible decrease in demand in the Euro zone countries, in Poland the dynamics of retail sales decreased only slightly and (with few exceptions) it did not show decreases in absolute values, which occurred relatively frequently in the region of Warmiaand Mazury. This means that during the period studied, consumers in Poland did not respond to the catastrophic visions of crisis presented in the media and maintained a high level of demand.

According to the data by the Central Statistical Office, during the period covered, the highest increase in the share in retail sales was recorded for the section of "non-food consumption goods" (increase by 1.5 percent point) and "non-consumption goods" (increase by 1.4%). The share of alcoholic beverages and tobacco products practically did not change, while in the case of food and non-alcoholic beverages as well as own goods and products a decrease by 2.7% and 0.3% respectively occurred. It is projected that during the nearest future, a slowdown in the dynamics of retail sales will take place resulting mainly from deterioration of the situation in the labour market and relatively high inflation which limits the real wage increase rate. A significant role will be played by factors of a psychological nature, i.e. reactions to changes in the moods of consumers in the EU countries.

The economy of Warmia and Mazury is also influenced by a less favourable economic situation abroad.The period until December 2011 was characterised by a systematic deterioration in sentiment among entrepreneurs from the Euro zone, including the German economy, which is of key importance for the currency area. The IFO index value representing the climate for business in the German economy as in December 2011 was 107.3 points compared to 107.5 points as at the end of the third quarter and 114.5 points in December 2010. The International Monetary Fund decreased the forecast of the GDP increase in Germany in 2012 from 2% estimated in April

2011 to the level of 0.8% in September 2011. The main reasons for the decrease in the GDP dynamics will include the consequences of the Euro zone economic debt crisis and the decrease of consumption in the German economy.

The current account balance in the fourth quarter of 2011 was negative at 4,964 million EUR[6]. The level of that balance was decided by the negative balance of revenues (3,375 mln EUR) and of trade (2.814 mln EUR) as well as the positive balance for services (714 mln EUR) and current transfers (511 mln EUR). The negative current account balance as compared to the data for the fourth quarter of 2010decreased by 1,326 mln EUR. The decrease of the negative current account balance was influenced by the increase in the positive balance for services by 110 mln EUR and the higher positive balance of current transfers by 603 mln EUR. At the same time the negative balance of revenues decreased by 79 mln EUR and the deficit in trade decreased by 534 mln EUR. The balance of the capital account was positive at the level of 3,562 mln EUR.

The exports of goods during the fourth quarter of 2011 were estimated at the level of 35.1 billionEUR while imports amounted to 38 billion EUR. Compared to the fourth quarter of 2010, the exports of goods increased by 7.3% while the imports of goods increased by 5.1%. The negative balance of trade amounted to 2.8 billionEUR as compared to 3.3 billionEUR during the fourth quarter of 2010.

During the fourth quarter of 2011, the balance of international services was positive, amounting to 714 mln EUR. The level of the positive balance of services was determined, first of all, by the balance of transport services amounting to 728 mln EUR (an increase by 268 mln EUR as compared to the fourth quarter of 2010) and foreign travel amounting to 392 mln EUR (a decrease by 98 mln EUR). At the same time, the balance for the other services was negative, amounting to 406 mln EUR (a decrease by 60 mln EUR).

During the analysed quarter of 2011, the balance of revenues from abroad was negative, amounting to 3,375 mln EUR. The level of the negative balance of revenues from investments during the fourth quarter of 2011 was influenced the most by the revenues obtained by direct foreign investors, amounting to 2,547 mln EUR. That amount consisted of the dividends disbursed (amounting to 539 mln EUR), reinvested profits (1,392 mln EUR) and interest paid on the loans (616 mln EUR). The revenues of foreign direct investors from their capital involvement in Polish entities were lower by 382 mln EUR, i.e. 13.0% as compared to the equivalent quarter of 2010.

The negative value of the balance of revenues was increased by revenues disbursed to non-residents for portfolio investments in Poland (in the form of

[6] Prepared on the basis of: Bilansp atniczy w 2011 r., NBP, http://www.nbp.pl/statystyka/bilans_platniczy/bop_kw2011.pdf

dividends received from share securities and interest on debt securities issued by Polish entities). The revenues of non-residents in this case amounted to 1,102 mln EUR.

During the fourth quarter of 2011, the inflow of funds from the European Union included in the balance of payments amounted to 4,412 mln EUR. That was the highest in value quarterly inflow of capital since Poland's accession to the EU. The inflow amounting to 853 mln EUR was included in the current transfers, while the amount of 3.559 mln EUR in capital transfers. During the same period, Poland paid 826 mln EUR to the European Union budget as membership contributions and fees. As a consequence of those transactions, the balance of transfers with the European Union was positive and amounted to 3.586 mln EUR.

During the fourth quarter of 2011, the balance of foreign investments in Poland was positive, amounting to 2,562 mln EUR. The amount of the balance of foreign investment in Poland was influenced by the net capital inflow from foreign direct investments and foreign loans to Polish entities. At the same time,an outflow of net capital from the current and deposit accounts of non-residents in Polish banks was recorded.

The balance of the foreign direct investments in Poland was positive and amounted to 1.892 mln EUR. The level of this balance was determined mainly by the inflow of net capital from investments in debt instruments, amounting to 2,535 mln EUR and positive reinvestment of profits, amounting to 1,392 mln EUR. The outflow of net capital resulting from decreasing the equity of Polish enterprises due to direct investments amounted to 2.035 mln EUR.

The positive balance of foreign portfolio investments during the fourth quarter of 2011 amounted to 546 mln EUR. It resulted, first of all, from the net inflow of capital from investments by non-residents in debt securities amounting to 350 mln EUR (mainly investments made by non-residents in the Government bonds).

Short-term perspectives of changes in the economy of Warmia and Mazury

The development of the economic situation in the province of Warmia and Mazury is determined, similar to the national situation, by factors included in the category of the advance variables of the economic market situation. In the case of this analysis, the prognostic element is implemented by such indicators as the IFO index, whichreflects the economic mood in Germany (the major trading partner of Poland), the number of building permits issued (that indicates the trends in the construction industry) and by the multiplication

effect in the majority of the sectors of the economy, the situation in the banking sector describing the size of demand for credit in the economy and a prognostic indicator defining the expectations of enterprises concerning the development of the production order portfolio.

The Pengab index value in January 2012 remained at a level similar to the preceding month, i.e. it was 24 points,which was 0.1 points more than in December of the preceding year[7]. An improvement was recorded mainly in the banks with majority foreign capital, while in institutions of other types the situation either did not change or decreases were recorded.

The Pengab index, treated as a synthetic market cycle indicator in banking institutions, increased by 0.1 points as compared to December: from 23.9 points to 24.0 points. At the same time, the Pengab index value decreased in cooperative banks from 27.5 points to 22.1 points and in banks with majority domestic capital- from 20.8 pointsto 20.2 points while in the banks with majority foreign capital it increased from 25.2 points to 28.6 points.

The total deposits in the current accounts increased in 49% of the institutions (an increase by 13 points as compared to the result for December); the deposits of individuals in 42% while deposits by business entities in 39%. A decrease in the activities of deponents was recorded in12% of the institutions; the deposits of individuals in 11% and deposits by business entities in 13%.

The total time deposits increased in 50% of the institutions (an increase by 1 point as compared to the result for December). In the segment of households, they increased in 46% of the institutions and in the segment of business entities in 34% of the institutions. Total decreases occurred in 12% of branches; the deposits of individuals in 13%, while deposits by business entities in 12%.

The total number of loans originated increased in 47% of institutions, decreased in 21% of them and did not change in 32%. The increase in lending to individuals was recorded in 45% of the institutions while the increase of lending for business purposes in 39% of branches; the decrease occurred in 20% and 22%, respectively.An increase in lending operations is expected by 57% of the institutions – 50% in the segment of individuals and 53% in the segment of corporate clients. Limitation of the total lending activities is expected by 7% of the institutions;lending for the individuals – 13%, and lending for corporate clients – 6%. The value of irregular loans to individuals increased in 24% of the institutions, decreased in 14% and did not change in 62%.

An increase in consumer loans for individuals occurred in 38% of institutions, a decrease in 17%, while in 45% of them the level of lending was

[7] Prepared on the base of: *Monitor Bankowy 1/2012*. ZwiązekBankówPolskich, Pentor 2012.

unchanged. The consumer loans to individuals will increase according to the representatives of 46% of the institutions, decrease according to 13% while 41% of the respondents project no change. The prognostic index is 34 points. For the nearest future, the banking market is expecting a revival linked to the increase in corporate client activity in the spring (the seasonal factor). On the other hand, the continually unsure situation in the Euro zone may be a negative factor. Because of the links between the banks operating in Poland with foreignparent institutions, an unfavourable situation in the Euro zone countries may cause a limitation of loan supply and an increase in loan price, which will have an unfavourable influence on the real economy.

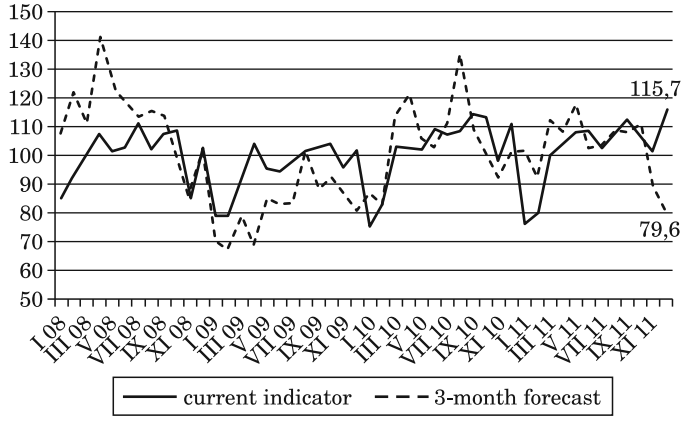

Fig. 1. Value of the synthetic market cycle indicator in the province of Warmia and Mazury
Source: own research.

The status of the business cycle in the province of Warmia and Mazury as at the end of 2011 was better than in the equivalent period of the preceding years by 5 points. The value of the synthetic market cycle indicator in December 2011 was 115.7 points and it was higher than the index value from the end of the third quarter of 2011 by 3.1 points and was higher than the indicator value from the end of the second quarter of 2011 by 7.5 points. The value of the short term predicative indicator was 79.6 points and it was lower by 28.2 points compared to the third quarter of 2011 and lower by 8.8 points than the indicator from November 2011. The increase in the current market cycle indicator value in December 2011 compared to the results from the end of the third quarter of 2011 was influenced by an increase in all component variables, with the exception of the results from the labour market. The highest increase in the scores was shown by construction, which is justified by the end of the year and the conclusion of the undertaken investment projects.

A large increase was also observed in the retail sales variables and the level of wages in enterprises. This is also the effect of the phenomenon of seasonality. December is the month of Christmas shopping and the disbursement of bonuses, overtime payments and awards. The situation in the regional labour market had a negative influence on the business cycle indicator value. The unemployment rate increased by 0.7 percentage points as a result of the increase in the number of unemployed by 4,100 persons. At the same time, the number of job offers decreased significantly (a decrease by 13.3%). The level of evaluation of the current situation of enterprises also had a positive effect for the value of the current indicator.

The value of the short-term prognostic indicator represents the result of the positive and negative changes influencing the value of the forecast. The increase in the number of building permits issued (by 15.4 percentage points) and a slight improvement of the situation in the German economy reflected by the IFO index value should be classified to the first group of variables in December 2011. Deterioration of the situation in the banking market, expressed by means of the synthetic Pengab indicator as well as the value of expectations of entrepreneurs concerning the orders for production, mainly those intended for exports, were included among the variables decreasing the forecast value in December 2011.

Recapitulating the evaluation of the province of Warmia and Mazury economic situation, it can be concluded that after a relatively good first half of 2011, a slight slowdown in the economic growth rate occurred again. It was manifested in a decrease in the dynamics of such indicators as the industrial production, construction-assembly production, retail sales and the employment rate.

The local labour market situation is the area of the largest concern. The high level of unemployment (20.1%), which will increase during the two consecutive months, is an issue of particular concern. The forecasts of unemployment decrease refer rather to the second quarter of 2012. The level of prices in the region is similar to the dynamics for the entire country. The situation in foreign trade is relatively good, as a consequence of the performance of orders from the preceding periods and the relatively weak Polish zloty, which supports exports.

Entrepreneurs; expectations concerning the following quarter are prudent. They expect deterioration of the general economic situation in the majority of industries. It should be remembered that the fourth and the first quarters of the year are characterised by usually less favourable influence of factors of a seasonal nature, which is particularly manifested in the labour market. A decrease of unemployment in Warmia and Mazury might potentially be supported by opening of the labour market in Germany, although so far this

has not been reflected in the unemployment indicator. It seems that the economic development of the region during the consecutive quarters will be determined by the dynamics of private sector growth in Poland and in the EU countries, and this shows a slowing trend. The decrease in activities of territorial governments implementing investment projects from public funds may also be a factor slowing down the development rate. This results from limitation of the potential for contracting public debt imposed by the Ministry of Finance in 2011. Lack of sufficient own funds will be a barrier to co-financing investment projects from EU funds.

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ISSUE OF VALUATION AND PAYMENT OF FEES, CHARGES AND RESTITUTION COSTS OF THE FOREST ECOSYSTEM USED FOR ROAD PROJECTS

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K e y w o r d s: environment, valuation, resources, protection of agricultural and forest lands, fees, charge, compensation, restitution costs, space.

A b s t r a c t

This paper presents the issues related to the fees paid by entities for exclusion of a forest from production. Forests and forest lands are covered by statutory protection against change in use for purposes other than forest. The government has introduced fees and yearly charges for which the method of computation is included in the Act on Protection of Agricultural and Forest Lands (Act of 3 February 1995 on protection of agricultural and forest lands, Dz.U. of 2004 No. 121, item 1266). The total fees include a one-time fee, yearly charges and compensation for the early felling of standing timber if it has not reached felling age.

The problem of valuation of the statutory fee, once-only fee, the year fees, compensation for early felling of standing timber and the problem of possible ecosystem restitution costs are all analysed in this work.

The study also aimed at determining the amounts of fees and charges paid by a private entity for exclusion of 1 ha of forest land from production.A case study covering 1 ha of riparian forest excluded from production permanently was used as the method of study. The amounts of fees and charges due for exclusion of the forest from production and the costs of ecosystem restitution were computed.

The study showed that the fees and charges imposed by the government do not satisfy the criterion of equivalency according to the principle that "the user pays" because of the omission of the costs of restoring the ecosystem.

WYCENA NALEŻNOŚCI, OPŁAT, ODSZKODOWAŃ I KOSZTÓW RESTYTUCJI EKOSYSTEMU WYKORZYSTANEGO POD INWESTYCJE DROGOWE

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S ł o w a k l u c z o w e: środowisko, wycena, zasoby, ochrona gruntów rolnych i leśnych, należności, opłata, odszkodowanie, koszty restytucji, przestrzeń.

Abstrakt

W pracy poruszono problematykę opłat ponoszonych przez podmioty za wyłączenie lasu z produkcji. Lasy i grunty leśne są objęte ustawową ochroną przed zmianą przeznaczenia na cele inne niż leśne. Ustawodawca wprowadził obowiązek uiszczania należności i opłat rocznych, których sposób obliczania zawarto w ustawie o ochronie gruntów rolnych i leśnych (Ustawa z dnia 3 lutego 1995 r. o ochronie gruntów rolnych i leśnych, Dz.U. 2004, nr 121, poz. 1266). Na całość opłat składają się: należność jednorazowa, opłaty roczne i odszkodowanie za przedwczesny wyrąb drzewostanu w przypadku nieosiągnięcia wieku rębności.

Przedmiotem rozważań były problemy wyceny należności ustawowej, należności jednorazowej oraz odszkodowań, opłat rocznych za przedwczesny wyrąb drzewostanu, nakładanych zgodnie z przepisami prawa, oraz ewentualnych kosztów restytucji ekosystemu.

Celem pracy było ustalenie wysokości opłat ponoszonych przez podmiot prywatny za wyłączenie 1 ha gruntu leśnego z produkcji oraz ocena praktyki gospodarczej w tym zakresie w odniesieniu do nowoczesnych metod wyceny ekosystemów. Zastosowano metodę studium przypadku, obejmując zasięgiem 1 ha lasu łęgowego trwale wyłączonego z produkcji. Policzono wysokość opłat za wyłączenie lasu z produkcji na podstawie wytycznych zawartych w ustawie oraz z uwzględnieniem kosztów restytucji ekosystemu.

Badanie wykazało, że opłaty nakładane przez ustawodawcę nie spełniają kryteriów ekwiwalentności w myśl zasady „korzystający płaci". Przyczyną jest pominięcie kosztów odtworzenia ekosystemu.

Introduction

Allocation of forest or agricultural lands for uses other than forest and agricultural uses requires obtaining a permit for a change in the intended use in the local physical development plan. Following the change of the land intended use in the above-mentioned plan, before issuing the "building decision", the land should be excluded from production according to the procedure stipulated in the Act on Protection of Agricultural and Forest Lands (op. cit. item. 1) and the Act on Physical Planning and Development (Act of 27 March 2003 on physical planning and development (Dz.U. of 2012, item 647). According to the provisions of the acts on forests (Act of 28 September 1991 on forests (Dz.U. of 2011 No. 12, item 59) and on real estate management (Act of 21 August 1997 on real estatem anagement (Dz.U. of 2010 No. 102, item 651), exclusion of land from production requires lodging an application with the Director of the Regional Directorate of State Forests (areas of national parks are an exception) with the required documents. Exclusion of forest land from production (depending on the owner) also involves the statutory requirement of paying the fees and charges by the applicant. In case of permanent exclusion of forest land from production, these include: a statutory fee, a year charge and compensation for early felling of standing timber. In the case of projects that use space at the expense of ecosystems, the fee, charges and compensation should be included in the project costs. However, according to the Act on Forests, exclusion of lands owned by the State Treasury does not generate the above costs for the investors, particularly if the land used for the project is

public property (of the State Treasury or territorial government). Those costs are included in the costs of land acquisition. For road projects that are classified as projects for public goals other regulations are available. In that case, the applicant does not bear the statutory costs of excluding the land from production.

For commercial projects, the investor pays the fee, charges and compensation. The fee and charges paid by the investor depend on the current price per 1 m^3 of timber. This means that the valuation considers only the costs of the timber raw material without considering other factors. The forest is not just a formation of trees but a compact and complete ecosystem. Exclusion of forest from forest production results in complete destruction or reorganisation of the ecosystem. According to the effective legal regulations, the value of the destroyed ecosystem and restitution costs – costs of moving and restoring the ecosystem in a different location – are not considered in determining the fees and costs.

The government fee paid once and the annual fees were determined based on the Act on Protection of Agricultural and Forest Lands (op. cit. item 1) and executive acts for it. The costs of restitution of an ecosystem were determined based on the Legal Property Act (op. cit. item 4) and relevant executive acts. Detailed procedures of evaluation were highlighted in Chapter 3.

Review of literature on functioning of forest ecosystems

In the past, forestswere a basic resource for satisfying human needs and were seen as a free good, which under natural conditions is available in unlimited quantities and satisfies the human needs fully. There was no need for making outlays for using free goods and man was not forced to restrict consumption of such goods, as was the case with rare goods (SAMUELSON, NORDHAUS 2009). The forest was the source of food (animals, plants), materials for clothing production (animals), building materials (trees) and fuel (timber). In the modern economy, forest cannot be classified as a free good because the functions of the forest have also changed. The habitat-creating, recreational, aesthetic and landscape-creating functions are particularly highlighted. Forests also perform a protective function through water and carbon dioxide retention (ŁOJEWSKI 2007).As the forest is not a free good, the outlays of factors of production are necessary to maintain values satisfying human needs. The costs of outlays necessary for maintaining those characteristics of forests should also be subject of valuation. The concepts of sustainable development aim at considering such costs in the process of restitution of a given good that others could use. If restitution is not possible, financial compensation should

be considered. Consequently, valuation of the costs of outlays would represent a tool for internalisation (including the costs into own account) of external costs related to destroying the forest ecosystem by the "one responsible for" the investment project.

Forests and the concepts of sustainable development and eco development

The concept of sustainable development appeared for the first time in the Report of the World Commission on Environment and Development[1] of 1987 where it was defined as satisfying the current needs without bearing the risk that the future generations will not be able to satisfy those needs. The concept considers the issue of long-term development ability coupled with simultaneous satisfaction of the criterion of inter-generational justice (KOŚMICKI 2010). Sustainable development may be defined as the process of searching for, checking and implementing new forms of economic development, technology, forms of energy, social communication and forms of extra-economic activities of society to ensure high living standards of many generations and possibly rapid resignation from the achievements of current civilisation unfriendly to the natural environment and man (GÓRKA et al. 2001).

Eco-development is a narrower notion which is contained within the notion of sustainable development (GÓRKA et al. 2001). In 1975, at the Third Session of the United Nations Environment Programme Governing Council, the thesis was accepted that a society implementing the idea of eco-development accepts the supremacy of ecological requirements that cannot be disturbed by civilisation growth or cultural and economic development. Society must be capable of self-control of its development for the purpose of maintaining homeostasis and symbiosis with nature, consequently respecting economic production and consumption and using waste and take responsibility for the future consequences of the actions undertaken, whichincludes the needs and health of future generations (*Ochrona*... 1984).

An ecologically valuable ecosystem is not precisely defined. Consequently, it can be defined as a naturally valuable area within which an organism, species or a group of organisms or an inanimate object, habitat, ecosystem or landscape occurs (*Ekologiczne*... 1984). An ecologically valuable area may be influenced by characteristics such as rarity, typicality, usefulness, symbolism

[1] Gro Harlem Brundtland – three times the Prime Minister of Norway (1981, 1986–89, 1990–96), Director General of the World Health Organisation (1998–2003). As of 2007, one of the three Special Envoys on Climate Change for the United Nations Secretary-General Ban Ki-moon. Chairperson of the World Commission on Environment and Development (1984–1987).

or aesthetic values of a given component of the environment. According to the economic criterion, such an area is characterised by biological and landscape diversity (measured by appropriate methods and indicators) or it may be a factor of economic activity or limit the conventional forms of economy to a significant extent (LIRO 2000).Consequently, the benefits lost because of the possible limitation of the freedom of management can be the measure of the value of ecologically valuable areas.

While performingthe selected and necessaryfunctions of the forest, the remaining forest functions should also be retained. The forest economy should be based on sustainable development and consider the future functions of the forest (that the forest will fulfil) considering the long period needed for the development of the forest ecosystem. The use of any of the forest functions means intervention in the forest ecosystem. Excessive economic use of that resource may lead to irreversible degradation of the ecosystem or the risk to natural reconstruction of the forest ecosystem. The principles of forest economics based on sustainable forest development lead to rapid regeneration and restoration of useful values (PASCHALIS-JAKUBOWICZ 2011).

Sustainable development of forests requires compromisesbetween its major functions (PŁOTKOWSKI 1994). The following functions are identified as the major forest functions: production (economic), social (recreational) and ecological (habitat-creating). In intensifying a chosen forest function, one should expect increasing alternative costs and the necessity of limiting the other functions (HOLLAND et al. 1994).

Valuation of forest resource issues and the valuation of environmental resources

The aim of environment resource valuation is to determine the level of outlays that have to be incurred to use those goods. Free goods are becoming economic goods and it is necessary to incur the outlays of labour and capital to give those goods the values of usability. The transition of free goods into the domain of economic goods is represented in figure 1.

Project environmental impact assessment is important for an increasing number of institutions financing investment projects. Institutions taking such decisions require environment impact assessments to present the quantified results. Determination of fees that organisations must pay to compensate society for using the natural environment represents another issue. Use includes through air pollution, inappropriate water management, soil pollution, production of solid and liquid waste, emission of noise and other forms of externalisation of costs. In such cases, valuation represents a necessary element for internalisation of the external costs.

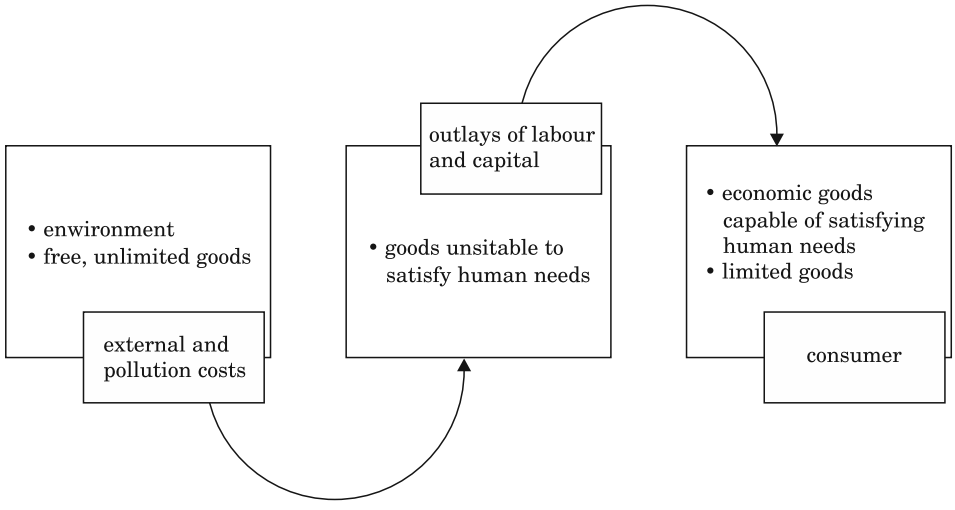

Fig. 1. Process of the transition of free goods into the domain of economic goods
Source: own work.

The difficulty with environment resource valuation is a consequence of, first of all, an absence of the procedures, methods and techniques of valuation implemented formally in economic practice. In most cases, the value of environment values results just from their existence (KOŚCIK 2000) and there is no market for such goods which, in turn, makes determining the market value and price that the consumers would be willing to pay for them impossible.

Provisions of Polish law requireentities to pay fees for using the natural environment. The Act on Protection of Agricultural and Forest Lands (op. cit. item 1) imposes on the applicant the duty to pay fees and charges for exclusion of forest lands from production. The process of exclusion involves two stages (CYMERMAN 2012): (1) planning, whichinvolves change of the land use in the local physical development plan and (2) administration, involving obtaining consent for exclusion of forest lands from production. At that stage, the amount of fees and charges for exclusion is determined (CYMERMAN 2009).

In case of permanent exclusion of forest lands from production, the applicant must pay a once-only fee, bear the yearly charges (at 10% of the fee paid once) and pay compensation for the early felling of standing timber, if the forest was excluded from production prior to the achievement of felling age. In case of temporary exclusion of forest land from production, the applicant is required to pay yearly fees representing 10% of the fee for exclusion during the period of exclusion, not longer, however, than 20 years. As in the case of

permanent exclusion, the applicant must pay the compensation for early felling of standing timber. The types of fees and charges depending on whether the exclusion is permanent or temporary are presented in figure 2.

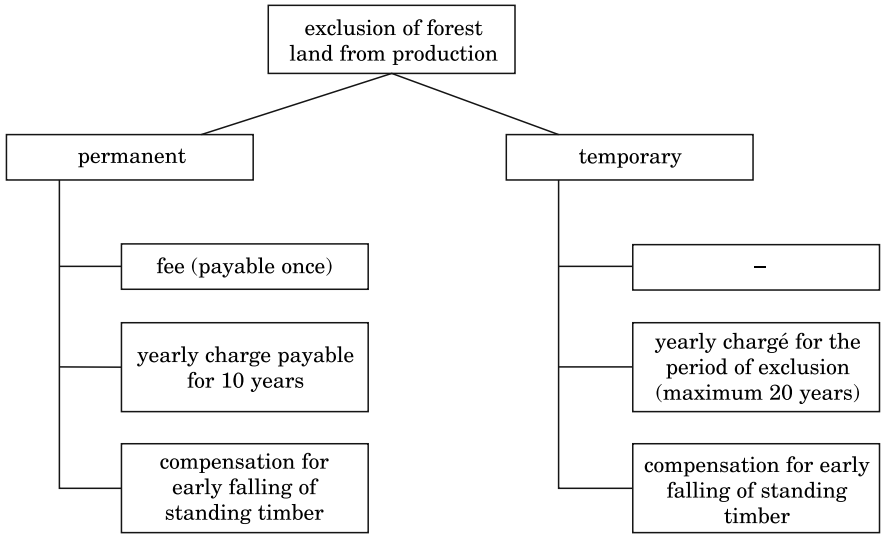

Fig. 2. Types of fees and charges payable for excluding forest land from production
Source: own work based on the Act of 3 February 1995 on protection of agricultural and forest lands (op. cit. item 1).

The amount of the fee payable once depends on the area being excluded, coefficient determining the quantity of cubic metres of timber for a given type of habitat (multiplied) and the price per 1 cubic metre of timber announced by the Central Statistical Office (GUS), which is presented in table 1.

Table 1

Indicators determining the price equivalent of 1 cubic metre of timber

Forest habitat type	Price equivalent for 1 cubic metre of timber announced by the GUS
Forests: fresh, humid, riparian and mountain as well as sycamore forest and mountain alder carr	2,000
Mixed forests: fresh, humid, highland, mountain and alder carr	1,500
Mixed coniferous forest, fresh, humid, highland, mountain	1,150
Coniferous forest: fresh, humid, mountain	600
Coniferous forest: dry and marshy	250

Source: Act of 3 February 1995 on protection of agricultural and forest lands

The amount of the fee for exclusion is computed according to the formula:

$$N_u = p_g \cdot R \cdot C \tag{1}$$

$$N_j = N_u - W_r \tag{2}$$

where:
N_u – statutory fee,
N_j – fee payable once,
p_g – area of excluded land,
R – multiplicity of the equivalent of the price for 1 cubic metre of timber dependent on the forest habitat type,
C – current price per 1 cubic metre of sawmill pine timber as announced by the GUS,
W_r – land value determined according to the market prices applied at the given locality in trade in land on the date of actual exclusion of the land from production.

The yearly charge is correlated directly to the amount of the once-only fee. In case of permanent land exclusion from forest production,a yearlycharge equivalent to 10% of the once-only fee is paid for 10 consecutive years. The fees and charges represent revenues of the forest fund and they are accumulated in a separate account. Those funds are used for financing actions focused on protection, reclamation, improvement of the quality of land, disbursement of damages and others.

The compensation for early felling of standing timber is equal to the difference between the expected standing timber value at the felling age and the standing timber value at the time of actual felling. The expected standing timber value is recorded in the forest development plan. In the case of young forests that do not qualify for felling, the compensation is equal to the value of costs incurred for establishment and care for the standing timber. Those relations can be described by the formulas:

$$O = (W_i - W_s) \cdot Z \cdot P \cdot C \tag{3}$$

or

$$O = W_k \cdot Z \cdot P \cdot C \tag{4}$$

where:
O – compensation amount in PLN,
W_s – indicator of the value of 1 ha of standing timber at the age of early felling of that standing timber,
W_i – indicator of the expected value of 1 ha of standing timber at the felling age defined in the forest development plan,

W_k – indicator of the value of costs incurred for establishment and cultivation of 1 ha of standing timber,
Z – degree of forest land coverage with tree at the age of early felling of standing timber,
P – area of standing timber in ha,
C – current sales price per 1 cubic metre of timber given in the Communique by the President of the GUS.

Provisions of the Act on Protection of Agricultural and Forest Lands (op. cit. item 1) allow the Director of the Regional Directorate of State Forests remission of the fees and charges on condition that the future investment project is of public utility for education, culture, religious, health protection or social reasons. Remission of payment is also eligible if the land under roads is publicly owned and the excluded land is the property of the State Treasury or territorial government (of provinces, counties, communes). Consequently, fees and charges are levied on forest lands belonging to private owners when the exclusion from forest use takes place for commercial purposes.

Valuation of ecosystems

In the literature (e.g. ŁAGUNA, WITKOWSKA-DĄBROWSKA 2010),proposals can be found for valuation of ecosystems that are not introduced to practice by statutory regulations. For most methods, it is assumed that the good (environment) is worth as much as somebody is able to pay for it. Consequently, those methods are based on two economic categories (POSKROBKO 2011):

– willingness to pay for the good -the amount that an entity would be willing to pay to obtain the given good to maintain the same level of affluence as in the situation of possessing the money and not the good;

– willingness to accept – the amount that would have to be paid to the entity for transfer of the good to maintain the same level of affluence as in the situation of not obtaining the money and retaining the good.

Among the valuation methods, the following are mentioned: cost and benefit analysis, outlay effectiveness analysis, external costs, environmental costs, minimisation of costs, production outcomes, preventive outlays, restitution costs, human capital costs, hedonic costs, travel costs and the declared preferences. Those, however, are the methods described in the literature. They are not used in practice because of the absence of legal recommendations, e.g. in the Act on Protection of Agricultural and Forest Lands. The fact that it is easier to use the standardised and unified method for all ecosystems than to select a separate valuation method in case of each of them also supports that tendency.

Material investments using space are implemented at the expense of ecosystems in the environment. Economic use of space involves destruction of natural and primeval values. Consequently, the restitution costs method investigates the costs involved in moving the ecosystem to a different location or reintroducing it in a different one.

The restitution costs method is the most appropriate for valuation of the forest ecosystem because it offers the possibility of considering the entire costs of ecosystem restoration. It is based on valuation of the outlays necessary to introduce the destroyed ecosystem in a different location.

The aim of the restitution is:

a) moving the existing ecosystem to a different location, or

b) possibly the most accurate reproduction of the ecosystem in a different location.

Given the high level of ecosystem complexity, a complete restitution may not be possible. The complete forest ecosystem develops over a long time and not all the elements and relations between them may be completely known. Consequently, determination of the restitution costs for a given area may be unreliable.

Valuation of fees, charges, compensations and ecosystem restitution costs based on the example of 1 ha of ordinary forest – case study

Computations were conducted for determination of the total liabilities by an entity applying to the Director of the Regional Directorate of State Forests for permanent exclusion from production for a forest offelling age. The analysis covered 1 ha of the riparian forest.

Fees, charges and compensations

The fee paid as a single payment (statutory) is the product of the area excluded from production, the equivalent of the price per 1 cubic metre of timber as announced by the GUS and the coefficient for the forest habitat type. The coefficient for the riparian forest is 2,000 m^3 (tab.1).According to the Act on Protection of Agricultural and Forest Lands (art. 12, point 6), the amount due is decreased by the market value of land as of the moment of actual permanent exclusion of the land from production. According to the Communique by the President of the GUS[2], the average price per 1 cubic metre of

[2] Communique by the President of the Central Statistical Office of 20 October 2011 on the average sales price of timber computed according to the average timber price achieved by forest superintendent offices for the first three quarters of 2011 (Monitor Polski of 25 October 2011, item 970).

timber is 186.68 PLN. The average price per 1 ha of agricultural land according to the GUS (Statistical Yearbook of Agriculture for 2011) amounts to 18,037 PLN. The yearly charges are paid during the period of 10 years in the case of permanent exclusion of forest land from production. The amount of a single instalment is 1/10 of the fee paid as a single payment.
The single payment fee:

$$N_u = 1 \text{ ha} \cdot 2{,}000 \text{ m}^3/\text{ha} \cdot 186.68 \text{ PLN/m}^3 = 373{,}360 \text{ PLN},$$

$$N_j = 373{,}360 \text{ PLN} - 18{,}037 \text{ PLN} = 355{,}323 \text{ PLN}$$

Yearly charges:

$$\left(\frac{N_j}{10}\right) \cdot 10 = O_r = 35{,}552.3 \text{ PLN} \cdot 10 = 355{,}323 \text{ PLN}$$

The yearly charges may be paid in instalments for 10 years or in a single payment.

Compensation:

As (according to the assumption) the forest has reached felling age, the investor does not have to pay the costs of compensation for early felling of standing timber designated for sale. According to the regulation of the Minister of Environment of 20 June 2002 regarding the compensation paid as a single payment for early felling of standing timber (Dz.U. of 2002 No. 99, item 905), the compensation is computed as the product:

$O = (W_i - W_s) \cdot Z \cdot P \cdot C$, if the indicator W_s has been determined, or

$O = W_k \cdot Z \cdot P \cdot C$, if the indicator $W_s$has not been determined,

where:

O – amount of compensation in PLN,
W_s – indicator of the value of 1 ha of standing timber at the age of early felling of that standing timber,
W_i – indicator of the expected valueof 1 ha of standing timber at the felling age,
W_k – indicator of costs incurred for establishing and care for 1 ha of standing timber,
Z – degree of coverage with standing timber which is the quotient of the actual thickness of standing timber at the age of early felling and the thickness that could potentially be achieved by that standing timber,

P – standing timber area in ha,
C – current sales price per 1 cubic metre of timber according to the Communique by the President of the Central Statistical Office announced in the Official Journal of the Republic of Poland "Monitor Polski" for the purpose of the forest tax.

Indicators W_i and W_s are included in the annex to the regulation.

The sum of fees and yearly charges would amount to 686,720 PLN. This is the cost additional to the investment project cost for the investor.

Ecosystem valuation by means of the restitution (replacement) cost method

The aimof restitution is to move the existing ecosystem to another location or to restore it from the beginning at another location. Determination of the replacement costs may be achieved by means of three techniques: detailed, aggregated elements and indicator techniques. Those techniques are described in the literature concerning valuation (ŁAGUNA 2001). Such valuation requires a standard basis in the form of catalogues, price lists and indicators containing information on unit prices for individual works and materials or aggregated elements of such works and materials. The amount of ecosystem replacement costs is determined according to the following formulas:

– for the detailed technique:

$$W_o = \sum_{i=1}^{n} J_i \cdot C_i \cdot (1 + K_d) \tag{5}$$

– for the integrated element technique:

$$W_o = \sum_{i=1}^{n} J_e \cdot C_e \cdot (1 + K_d) \tag{6}$$

– for the indicator technique:

$$W_o = P \cdot K_j \tag{7}$$

where:
W_o – value in the replaced state,
J_i – individual works (e.g. tillage),

C_i – prices of individual works,
J_e – aggregated elements (e.g. preparation of the surface for planting),
C_e – prices of aggregated elements,
K_d – additional costs, e.g. profit,
P – area,
K_j – unit cost of replacement and cultivation (1 ha).

Determination of ecosystem value may also be achieved by applying the formulas used in forestry when the indicators of actual costs incurred for establishment and cultivation of 1 ha of plantation are available.

$$W_o = P \cdot K_j \tag{8}$$

where:
P – area,
K_j – unit cost of replacement and cultivation (1 ha).

The indicator technique was chosen for computation of restitution costs. The price indicators concerning the costs of planting and cultivation for 1 ha of the forest applied by companies participating in tenders were applied (ŁAGUNA 2012).The tenders are organised by offices of the forest superintendent and cover the works involved in the preparation of land, planting and cultivation of the forest.

$$W_o = P \cdot K_j = 1 \text{ ha} \cdot 24 \text{ PLN/m}^2 = 10{,}000 \text{ m}^2 \cdot 24 \text{ PLN/m}^2 = 240{,}000 \text{ PLN}$$

Consequently, the total cost that should be included in the investment project costs calculation is:

– the cost of fee paid as single payment, yearly charges and the compensation computed in point 3.1. amounting to 686,700 PLN;
– the ecosystem restitution cost amounting to 240,000 PLN.

Data concerning the costs of establishing and cultivation for forest plantation were obtained from the Kudypy Forest Superintendent's Office (2012). The costs depend significantly on the character of the land restored for afforestation (non-agricultural, after fire, after flood, after long snow coverage, after removal of the artificial bearing surface).

The data obtained from the Kudypy Forest Superintendent's Office for 2011 indicate that the funds allocated to establishment and cultivation of the forest amounted to 27,220.73 PLN per year, which gives for the 10-year period:

$$W_o = 10 \text{ years} \cdot 27{,}220.73 \text{ PLN/ha} = 272{,}207.30 \text{ PLN/ha}.$$

In total, the investor should consider in his investment effectiveness computations the fee paid as a single payment, yearly charge, compensation and ecosystem restitution costs. According to the effective legal regulations, the destroyed ecosystem restitution costs are not considered in the calculation of costs for the implemented road investment projects.

Summary and conclusions

Construction or modernisation of road, railway and similar infrastructure requires obtaining an area. It should be an area representing the lowest usability. It is impossible, however, to bypass forests. Exclusion of forest land from production as a consequence of construction of a road or other infrastructure involves paying a fee, yearly charges, compensation and, sometimes, restitution costs. The duty of computing and paying the charges imposed by the Act on the Protection of Agricultural and Forest Lands (op. cit. item1) depends on whether the project is implemented for public or commercial goals and whether a public or private entity is the forest owner.

In the case of a public entity and public investment project, the possibility of exemptions and remission exists. According to the legal regulations in force, in case a public entity is the owner of forest land and the project is of a public character, the amounts of fees, charges and compensations are not included in the calculations of costs for such projects. Additionally, the investors do not pay the ecosystem restitution (reproduction) costs.

If a private entity is the owner or the project is of a commercial nature, fees, yearly charges and the costs of compensation may be charged. The determination of who pays whom and when may vary widely. Nevertheless, the public should be informed about the total investment project costs.

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URBAN AREA REVITALISATION PROGRAMME IMPLEMENTATION CONDITIONS IN THE PROVINCE OF WARMIA AND MAZURY[1]

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K e y w o r d s: revitalisation, town.

A b s t r a c t

This paper identifies the major factors that are the conditions for implementation of local urban area revitalisation programmes. Studies conducted in selected towns of the province of Warmia and Mazury showed that the availability of own and external funding for project implementation, accumulation of social problems in the areas subject to revitalisation, the size and diversity of entities involved in the revitalisation process and the lack of comprehensive legal regulations concerning revitalisation process organisation (absence of the *Act on Revitalisation*) were the most important factors influencing the revitalisation processes among those implementing and coordinating the programmes.

UWARUNKOWANIA REALIZACJI PROGRAMÓW REWITALIZACJI OBSZARÓW MIEJSKICH W WOJEWÓDZTWIE WARMIŃSKO-MAZURSKIM

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S ł o w a k l u c z o w e: rewitalizacja, miasto.

A b s t r a k t

Celem opracowania jest identyfikacja głównych czynników warunkujących realizację lokalnych programów rewitalizacji obszarów miejskich. Badania przeprowadzone w wybranych miastach województwa warmińsko-mazurskiego wykazały, że z punktu widzenia realizatorów i koordynatorów programów rewitalizacji najważniejszymi czynnikami warunkującymi procesy odnowy miast są: dostępność własnych i zewnętrznych środków finansowych na realizację inwestycji, kumulacja problemów zaangażowanych w proces rewitalizacji oraz brak kompleksowych uregulowań prawnych, dotyczących organizacji procesu rewitalizacji (brak ustawy o rewitalizacji).

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Introduction

Contemporary towns are frequently challenged by the problem of developing degraded monumental, industrial or former military areas which have lost their functions. Revitalisation is one of the options for activating such an area.

The urban area revitalisation process is a complex category referring to activities by numerous entities undertaken in many areas of town functioning focused on simultaneous attainment of social, economic and spatial targets of its development.

This initially purely medical term meaning "restoring the life" (*re* + Latin *vitalis* meaning *lively, life-giving*) (*Słownik*... 1991, p. 746), was transferred to the domain of architecture and urban planning. The term revitalisation in relation to the urban areas started being used to describe the planned activities of local entities initiated mainly by the local government, encompassing not only modernisation and adaptation of the degraded terrains and structures, but also social and economic activation of such areas.

The term *revitalisation* is the most popular term used in the literature for the phenomenon of comprehensive renovation of the degraded areas in towns used by authors such as: J. Kromer (2010), W. W. Fritz, E. Joder Timothy, J. Mumphrey (1995), O. Dziekoński and K. Baczyński (2004), P. Lorens (2007), Z. K. Zuziak (1998). In the English language literature, this phenomenon is also referred to as *urban regeneration (French: regeneration urbaine)*, a term which is used by, among others, Ch. Landry (2008), P. Roberts and H. Sykes (2008). In the Polish literature, the term *urban renewal* can be found in publications by Z. Ziobrowski (2008), among others. However, the term revitalisation reflects the full, multi-aspect nature and complexity of the discussed process of social, economic, spatial and cultural transformations occurring within the crisis area subject to such transformations.

Revitalisation is a process of planned actions initiated and undertaken by local entities based on a comprehensive diagnosis and assessment of the status of available resources (social-cultural capital, economic capital, including the financial and spatial-environmental capital) as well as the needs of the local economy for their development but also the conditions and potential resulting from being in a certain local, regional, national and global environment. This involves the stimulation of existing functions of the urban areas defined as a crisis area or giving it new functions for the purpose of activating it for the general development of the entire town (local development) (FARELNIK 2011, s. 96).

Given this definition of urban area revitalisation, the question arises as to whether the local authorities that are frequently the revitalisation programme initiators and operators are aware of the complexity of the revitalisation process and whether they are able to identify the key factors that condition the success of undertaken actions.

Methodology of study

Surveys conducted in the towns of the province of Warmia and Mazury in 2010 formed the basis for the urban area revitalisation process analysis. Within this framework, analysis of the contents of 57 local revitalisation programmes (LRP), implemented in towns of Warmia and Mazury during the years 2004–2010 was conducted. Additionally, interviews were conducted with revitalisation programme operators or coordinators (most frequently, they were mayors of the towns or town administration office employees involved directly in coordination of the LRP, designated by the mayor or president).

It should be pointed out that, as of 2004, the number of revitalisation programmes in the towns of Warmia and Mazury has been increasing continually. During the years 2004–2010, 20 revitalisation programmes were developed; in 2007, 32 programmes were under implementation, in 2008 – 40, and in 2009 – 54. In 2010, only 6 towns did not have an LRP (Biała Piska, Miłomłyn, Młynary, Ruciane-Nida, Sępopol and Zalewo). The other towns had one or more revitalisation programmes planned for the period of 2007–2013 or even until 2020.

Representatives of 22 towns[2] participated in the survey based on conducting interviews with the revitalisation programme operators. This group included 4 towns (Młynary, Pasym, Ruciane-Nida, Zalewo) declaring successful implementation of planning instruments other than LRP local development. In the town of Kisielice, the revitalisation programme available was not implemented as a consequence of limited own funds for investments and in Miłomłyn the revitalisation programme was under development. In the remaining 16 towns, the information necessary for conducting the evaluation of conditions and level of the undertaken revitalisation activities implementation was provided. Those included 12 small towns (with populations under 20,000) – Barczewo, Braniewo, Górowo Iławeckie, Mikołajki, Morąg, Nidzica, Olecko, Orzysz, Pasłęk, Pisz, Tolkmicko and Węgorzewo, 2 medium-sized towns – Mrągowo and Bartoszyce and 2 cities (exceeding 100,000 inhabitants) – Olsztyn and Elbląg.

[2] The enquiry for consent for conducting the survey was addressed to mayors and presidents of all 49 towns and cities in the province of Warmia and Mazury. A positive response was received from 22 towns and cities.

Motivations for development and factors conditioning implementation of the local revitalisation programmes

Attainment of the following goals was indicated as the leading motivation for the development of local revitalisation programmes: upgrading the quality of living in a given area (indicated in 13 towns), area image change (10 towns), ensuring population safety (9 towns), architectural renovation (8 towns), protection of the existing material culture and landscape values (8 towns), preventing area marginalisation (8 towns), renovation of housing resources (5 towns), creating spatial conditions for town development (4 towns), creating new jobs (4 towns), requirement of drafting the LRP in applying for the funds from the EU programmes (3 towns), integration of the area with the rest of the town (2 towns) and natural environment condition improvement (1 town). The structure of motivations for drafting the LRP in the towns of Warmia and Mazury is presented in Figure 1.

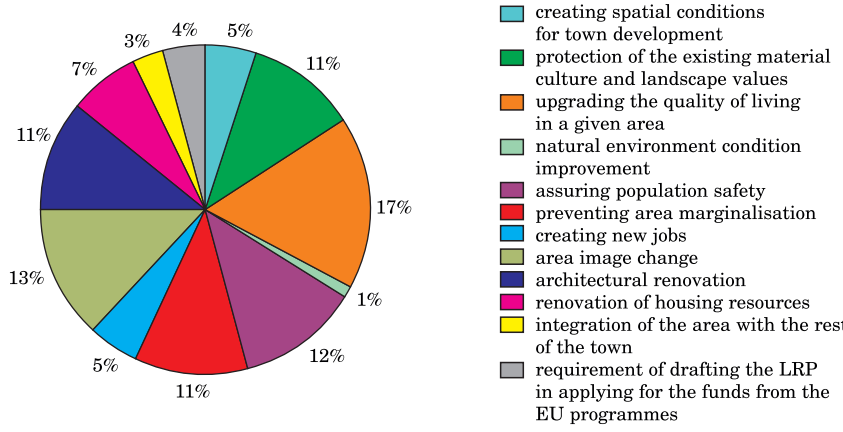

Fig. 1. Motivations for drafting the local revitalisation programme according to the respondents
Source: FARELNIK (2011, p. 212).

The diversity of motivations for selected local revitalisation programme development may result from the necessity of formulating sustainable town development. By frequently undertaking very far-reaching interventions in the degraded areas, town authorities aim not only at the urban quality improvement, but also at solving social (poverty, social pathologies) or economic (low level of entrepreneurship, unemployment) problems. Elaboration and implementation of a revitalisation programme consistent with the assumptions of other municipality development planning documents, without

neglecting the social, cultural, spatial and environmental issues, is a manifestation of the integrated town development planning.

The goals of local development which could be attained through revitalisation activities were identified by the respondents consistently with the assumptions of the following strategic documents: the town development strategy, local development programme, enterprise development programme, town marketing strategy, multi-annual investment programme, study of conditions and directions of physical development of the municipality, local physical development plans and the environmental protection strategy.

The degree of correlation between the local revitalisation programme goals and the goals of other documents used in the town development planning, according to the revitalisation programme coordinators, is presented in Table 1.

Table 1

Consistency of the local revitalisation programme goals with other planning documents

Document type	Local revitalisation programme				
	economic goals	social goals	spatial goals	environmental goals	cultural goals
Development strategy	****	****	****	***	***
Local development programme	***	***	***	**	**
Enterprise development programme	**	*	*	*	*
Town marketing strategy	*	*	*	*	*
Multi-annual investment programme	***	*	*	*	*
Study of conditions and directions of physical development of the municipality	*	*	***	*	*
Local physical development plans	*	*	***	*	*
Environmental protection strategy	*	*	**	*	*

Correlation of the LRP goals with other documents:
**** – very high
*** – high
** – moderate
* – low
Source: FARELNIK (2011, p. 213).

In the opinion of the LRP operators, the undertaken revitalisation activities served the attainment of most of the goals included in the development strategy and in the physical planning documents (study of conditions and

directions of physical development of the municipality and local physical development plan). Most frequently, the revitalisation programmes elaborated were identified with the attainment of economic, social and spatial goals while attributing a lower rank to environmental and cultural goals. According to the opinions from a few towns (e.g. Olsztyn), development goals were treated equally, according to the principle of an integrated and holistic approach to urban development planning.

Among the key factors conditioning the local revitalisation plan implementation, the following were the most frequently indicated:

1. Availability or limited availability of funds (indicated in 14 towns), related to the revitalisation investment financing capacity (frequently, given the nature of the area and structures, e.g. encompassed by conservation protection or requiring very costly reclamation works) from own budget funds. Towns, particularly the smallest ones, have difficulty obtaining sufficient funding for other investment activities. The importance of this limitation was also highlighted in the context of applying for support from the European Union funds for which providing an own contribution to the investment project represents a condition for obtaining the support. The possibility of obtaining investment project co-financing from structural funds available not only for revitalisation frequently forces the towns to make choices between projects for implementation – to choose a revitalisation project or a "green field" investment project.

2. Accumulation of social problems in the area covered by revitalisation (indicated in 12 towns) that require complex, long-term, systematically-implemented social activation programmes to limit the problems of social exclusion poverty, social pathologies and improvement of the level of residential safety. These are problems with different backgrounds, frequently correlated with long-term unemployment and, as a consequence, solving them or limiting their negative consequences is not an easy task. Consequently, the effective revitalisation is (and should be) evaluated from the perspective of the level of attainment of social and cultural goals, among others, the upgrading of living quality in the revitalised area.

3. The number of entities participating in the revitalisation process (indicated by 6 towns) which may be an element hindering undertaking and implementing the local revitalisation programme or even making it impossible, particularly if there is a lack of cooperation and dialogue skills among the local economy entities. In comprehensive planning of spatial renewal and socioeconomic activation of a town area, the involvement of numerous entities representing various interest groups – residents, entrepreneurs, local authorities, etc. is necessary. Building relations on so many levels may be seen as a hindrance to local revitalisation programme implementation. On the other

hand, however, compilation of such multi-directional activity of entities implementing social, economic, cultural and spatial goals allows the achievement of additional benefits from the revitalisation process that are not just the sum of the individual outcomes of individual actions, but also provide the effects of synergies.

4. Involvement of local leaders in the revitalisation process (indicated by 6 towns) that may be of key importance, particularly at the stage of planning the development based on problem area revitalisation. Participation in formulating the programme assumptions and later active participation in the implementation of specific projects builds a feeling of identification with revitalisation goals and conditions the sustainability of the long-term outcomes. This is particularly important from the perspective of reversing unfavourable social phenomena and urban degradation of an area subjected to renewal.

5. The issue of unemployment (indicated by 6 towns) that should be correlated with implementation of one of the fundamental economic goals of revitalisation, which is economic activation of the area. Given the current situation in the labour market of the province of Warmia and Mazury, where the unemployment rate is 20.1% (statistics presented by the Central Statistical Office in December, 2011) the problem of lack of jobs is seen in the surveyed towns as difficult to solve, also from the revitalisation programme perspective.

6. A long-term LRP implementation programme compared to the term in office of the authorities (indicated by 5 towns) is seen as a potential hindrance in the achievement of the intended long-term outcomes. Changes to the local government leadership in municipalities may mean changes in the town investment policies, e.g. favouring implementation of new investments using undeveloped areas (as less problematic and more effective economically).

7. Disorder in the real estate ownership structure in the revitalised areas (indicated by 5 towns) may represent a significant hindrance to revitalisation process implementation in the areas that, from an architectural, social-cultural or economic perspective, are particularly predisposed to it. Clear legal status of ownership represents a necessary condition for undertaking the revitalisation intervention.

8. Legal regulations (indicated by 4 towns) – a transparent system of revitalisation intervention instruments, is particularly important from the perspective of developing the spatial order in town centres and giving a new quality to the public spaces and is an important factor in revitalisation process planning and implementation. Fundamental regulations concerning this area could be provided by the *Act on Revitalisation* planned in Poland since the 1990s.

9. The attitude of the local community to the LRP (indicated by 4 towns) may range from disapproval and opposition through a neutral attitude to a positive attitude – approval and active participation. Only with the latter, similar to the situation of involvement of the local leaders in the revitalisation process, does it become possible to consider achieving the sustainability of the economic and social outcomes.

10. The complexity and multi-aspect nature of the revitalisation process (indicated by 4 towns) are characteristics that require from those implementing a local revitalisation programme more time and effort in drafting it and considering the interests of many local economic entities as well as the specificity of the areas in which they function (reside and conduct service, trade, cultural, educational, advisory and other activities). Revitalisation programme implementation represents a complex undertaking involving many entities and impacting numerous areas, as a consequence of which those characteristics are frequently seen as serious hindrances.

11. Difficulties with attracting external investors are treated as a limitation in the attainment of the economic activation goal in the revitalisation process (indicated by 3 towns). Local government authorities see their task here in the form of creating favourable spatial location conditions, e.g. providing appropriate infrastructural facilities (construction of roads, teleinformation and transmission networks, etc.) and economic conditions resulting from the accepted enterprise support programme or the support and promotion of innovative activity programmes.

12. The activity of organisations supporting the actions undertaken by the town in the area of revitalisation was indicated as a factor contributing to obtaining positive implementation outcomes by only 2 towns. Such a platform for exchange of experience and promotion of good practices has been built in Poland thanks to the activities of, among others, the Revitalisation Forum Association – an organiser of seminars, conferences and publisher of materials on revitalisation experiences in Poland and worldwide. None of the towns in Warmia and Mazury, however, is a member of this association. Towns of the region, although they collaborate with various entities (e.g. partner towns) in many other areas, in the area of revitalisation this collaboration is minor and is frequently limited to informal contacts at the stage of planning and considering the use of revitalisation instruments. The use of experience from training programmes on revitalisation and study tours was only indicated by the City of Olsztyn.

13. Transparent housing policy of the state was indicated by only 1 town as a factor conditioning the revitalisation process. This could be the result of identifying the process more with attainment of social-cultural, spatial or economic goals than with limiting problems such as the so-called "refurbishment gap" in Poland or upgrading the standards of housing units.

The key factors conditioning the local revitalisation programme implementation according to revitalisation operators and coordinators are presented in figure 2.

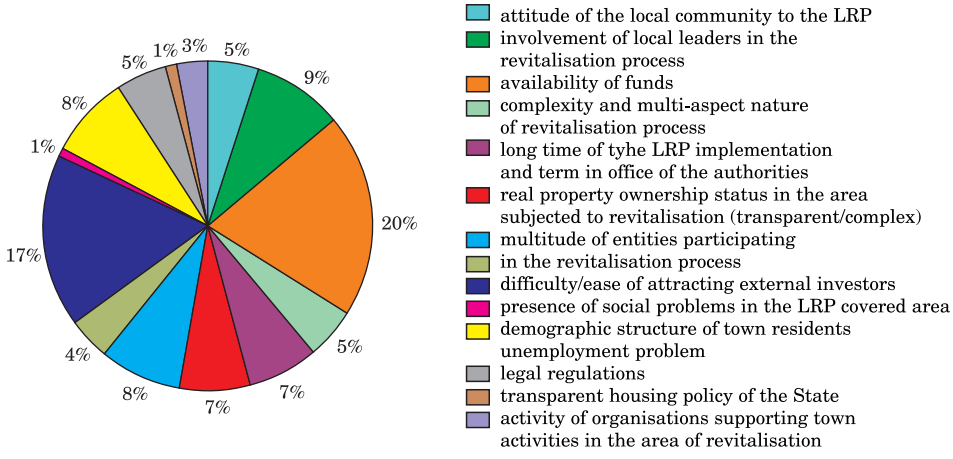

Fig. 2. Major factors conditioning revitalisation of urban areas according to the respondents
Source: Farelnik (2011, p. 217).

Units of the local government and their associations, where the local authorities are the initiators and coordinators of revitalisation programmes, as well as private entrepreneurs, housing condominiums and cooperatives, tertiary schools, non-government organisations and churches, were the main entities involved in the implementation of revitalisation programmes in the towns of the region. Revitalisation, in most cases, encompassed historical objects (such as a castle, town house, city hall, water tower, palace, etc.), residential buildings, particularly in the areas of concentrations of blocks of flats, buildings housing organisations and associations, schools, theatres, former military barracks, former industrial buildings (warehouses, production halls, etc.), churches and other objects of a sacral nature.

In the surveyed towns, the impact of the following revitalisation process outcomes on the development of the town was rated the highest:

a. in the economic domain:
   - unemployment limitation,
   - increased revenues from the real estate tax,
   - inflow of the external investment capital,
   - increase in revenues from tourism,
   - increased enterprise,
   - newly-established shops and service facilities,

b. in the social-cultural domain:
   – decreased crime,
   – limiting the problem of poverty,
   – limiting social pathologies,
   – residential housing standard improvement,
   – local community integration,
   – town image improvement,
   – increase in the number of participants in cultural events,
   – care for the cultural heritage condition,
c. in the spatial and environmental domain:
   – improvement of transport access,
   – introduction of a new order to public spaces,
   – decrease in the noise level,
   – decrease in the air pollution level,
   – decrease in the soil and water pollution level,
   – increase in the area of greenery.

Coordinators of revitalisation processes ranked the outcome of revitalisation improving the image of the town as being the most important (7% of total points awarded in evaluation of outcomes), introducing new order to public spaces (6.8%) and caring for the condition of the cultural heritage (6.2%). The lowest scores were given to outcomes related to the natural environment protection domain: decrease in the noise level (3.3%), decrease in the level of soil and water pollution (2.3%) and increase in the area of greenery (0.5%). It should be noted that in the evaluation of the revitalisation outcomes, the importance of social-cultural and spatial outcomes ranked the highest, while slightly less importance was attributed to economic outcomes.

Conclusions

The conducted surveys indicate that local authorities use the revitalisation programme as a town development-shaping tool increasingly often and with increasing awareness. Consecutive initiatives of drafting new plans or updating the existing revitalisation plans use the experiences acquired earlier, while the goals formulated for revitalisation programmes represent the development of goals approved in other documents. The revitalisation coordinators see this process as highly complex, engaging many types of local entities and offering outcomes in various domains of the town activities (spatial, economic, social and cultural). The key conditions for implementation of local revitalisation programmes are concentrated in the organisational, financial and legal domains. As a consequence, the most important factors conditioning successful revitalisation of a selected urban area are:

– the attitudes of the local community to the LRP,
– the activities of the local leaders and organisations supporting the revitalisation activities of the town,
– the availability of funding from the budgets of towns and external funding (e.g. the European Union funds),
– the skills of the authorities in coping with accumulated social and economic problems as well as disorganised real estate status in the revitalised areas.

Additionally, effective revitalisation of urban areas can be hindered by the absence of comprehensive legal regulations (e.g. the *Act on Revitalisation*) and a transparent housing policy.

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ECONOMICS OF ENERGY MANAGEMENT IN A COMMUNE – CHOSEN ASPECTS

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K e y w o r d s: energy sector, municipal management, ESCO model.

A b s t r a c t

Conditions of energy sector development correlated with shrinking resources of the conventional energy sources, increased importance of environmental policy as well as continual price increases cause that the territorial governments should, within the scope of their competences and abilities, rationalise energy consumption and costs. This paper presents the tools for energy sector rationalisation in a commune with consideration of the opportunities for optimisation of energy consumption costs within municipal resources by applying the ESCO model. The paper also draws attention to the possibility of utilising the resources of renewable energy sources by communal governments based on the example of wind energy, of which Warmia and Mazury has some of the largest resources in Poland.

EKONOMIKA GOSPODARKI ENERGETYKĄ W GMINIE – WYBRANE ASPEKTY

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S ł o w a k l u c z o w e: energetyka, gospodarka komunalna, model ESCO.

A b s t r a k t

Uwarunkowania rozwoju sektora energetycznego związane z kurczeniem się źródeł konwencjonalnych pozyskania energii, wzrostem znaczenia polityki ekologicznej oraz stały wzrost cen powodują, że samorządy gminne w zakresie swoich kompetencji i możliwości powinny starać się racjonalizować zużycie i koszty energii. W artykule przedstawiono narzędzia optymalizacji sektora energetycznego w ramach posiadanych przez gminę kompetencji, z uwzględnieniem możliwości optymalizacji zużycia energii w zasobach komunalnych przez zastosowanie modelu ESCO. Zwrócono również uwagę na możliwość wykorzystania przez samorządy gminne zasobów energii odnawialnej na przykładzie energii wiatru, której zasób na terenie Warmii i Mazur należy do jednych z największych w Polsce.

Introduction

In all countries of the world, the energy sector represents the basis of modern industry and economy; it is among the most important conditions for appropriate and comfortable functioning of society. The status of energy systems determines the energy security of states, regions and communes (PASIERB 2003, p. 78–92). Effectiveness of energy systems is based mainly on optimisation of the production and distribution processes, development of low prices, network availability and the reliability of the systems, which has a significant influence on the development of the other sectors of the economy and, above all, industry. The volumes of energy produced in the EU countries and Poland are presented in Table 1.

Table 1

Energy production in the EU and Poland

Year	Power production in the EU-27 (in billion kWh)	Dynamics in %)	Power production in Poland (in milliard kWh)	Dynamics in %)	Share of Poland's energy production in the EU-27 energy production (in %)
2007	3.19	100	139.1	100	4.36
2008	3.20	+ 0.3	140.4	+ 0.9	4.38
2009	3.03	– 5.7	133.8	– 4.7	4.42
2010	2.98	– 1.6	128.7	– 3.8	4.32

Source: Eurostat – An energy policy for Europe 2010.

For the past 3 years, a decrease in energy consumption has been recorded. Poland, as a member of the European Community, is implementing the common energy policy whose major assumptions are regulated in the documents and directives on energy efficiency[1]. The fundamental assumptions of the energy policy are presented in figure 1.

In Poland, the European legislation resulted in approval by the Council of Ministers of a document concerning the *Energy policy of Poland until 2030*[2], which assumes actions aiming at assuring energy security as well as environ-

[1] The fundamental documents determining the EU energy policy are: White Paper "Energy for the future: Renewable sources of energy" of November 1997, Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market, Directive 2006/32/EC on energy end – use efficiency and energy services, EU energy policyof 10 January 2007 in which the European Commission presents the package of measures in the field of energy and climate change, the Kyoto Protocol of 1998 in which countries committed themselves to decrease emissions of greenhouse gases.

[2] Energy policy of Poland until 2030 – Resolution by the Council of Ministers No. 202/2009.

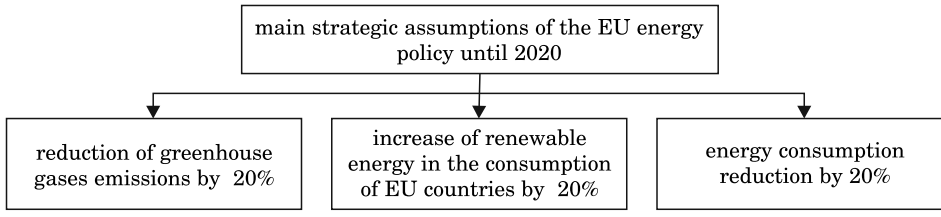


Fig. 1. Major assumptions of the EU energy policy until 2020
Source: European Parliament resolution of 26 September 2007 on a common European foreign policy on energy, http: europarl.europa.eu/meetdocs 2007.

mental protection. The document specifies priorities such as aiming at substituting heat plants supplying the heating systems of Polish towns with cogeneration sources, development of the national transmission system allowing reliable power transmissions, including closing the 400 kV loop and the power loops around the major towns of Poland, which is to improve the reliability of supply in those agglomerations as well as receiving energy from newly-established sources with particular consideration for wind power plants. Implementation of agricultural biogas production plant construction assuming creating, on average, one biogas plant in every commune by 2020 as well as the development of renewable energy from waste containing biodegradable materials, e.g. municipal waste, is projected.

The **Act on Energy law (**Dz.U. of 2006 No. 89, item 625) is the fundamental legal document influencing the energy market development and functioning energy sector enterprises in Poland. The Act aims at creating conditions for sustainable development of the country, assuring energy security, economic and rational use of fuels and energy, development of competition and preventing the formation of monopolistic structures. The regulation system created by the provisions of the Act has contributed, among others, to the gradual organisation of a system for recording and calculating the costs for every type of activity and for identification of the groups of consumers. The necessity of improving the energy management strategies at the commune level represents a research problem. The **aim of the paper** is to present a model of energy management in the commune as an important element determining the local energy security, as well as contributing to local development. The monographic method was the basic **research method employed**.

Energy sector organisation and management in the Commune

The Act on Changes to the Competences of Public Administration Bodies, as a consequence of the systemic reform of the state enacted by the Parliament on the 24th of July 1998 (Dz.U. No. 106, item 668),introduced amendments to the **Energy** Act that provided the territorial governments of communes (towns) the right, and imposed on them the duty, of formulating the energy policy assumptions for the area covered by the jurisdiction of such governments.

The commune is a sovereign entity to the extent defined by the law and its authorities are responsible for formulating the collective needs and expressing the interests of the community residing within its area. Fulfilment of the duties by the commune is represented, among others, by drafting the assumptions for the plan of demand for energy carriers. Such a document should contain information necessary for conducting an active energy policy, for which the boundary conditions are determined by the energy policy of the state, by the commune.

An active position of the regional authorities by means of, *inter alia*, drafting the energy sector strategy at the voivodship, county or commune level represents an important component supporting implementation of the European Union energy policy. For the purpose of appropriate planning of investments, including energy infrastructure development and new sources, it is necessary to prepare coherent investment plans at the level of communes and energy sector enterprises. The discussed document highlights that the communes must make the effort to draft plans and implement them for at least two reasons: due to the necessity to protect the environment and the possibility of obtaining EU and other public funds for related purposes. Communes, according to the energy policy assumptions, should implement a number of tasks concerning the energy sector as presented in Figure 2.

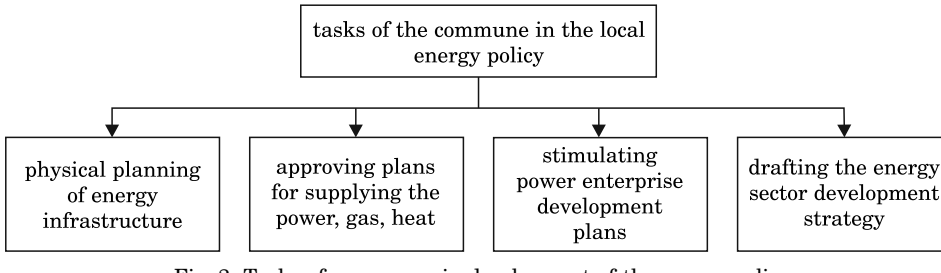


Fig. 2. Tasks of communes in development of the energy policy
Source: own work based on the Act – Energy law (Dz.U. of 2006 No. 89).

Construction and operation of energy infrastructure requires careful planning, which is a consequence of high investment costs and the requirement of satisfying numerous legal requirements governing such activities. The Energy Act (Dz.U. of 2006 No. 89) is the fundamental legal act regulating the energy sector. Communal authorities formulate the energy policy forthe purpose for implementing investment projects as well as the expectations concerning the future supply structure of the individual energy types and the transmission or distribution network which offers the consumer the freedom of choice of energy type or energy carrier used within the competitive market. The energy management developed by the commune will influence the entire functioning of the local community.

The commune energy supply plans covering power, heat and gaseous fuels represent the fundamental task in the area of planning the energy management development at the local level. Drafting the energy supply plan in practical terms is frequently neglected as a consequence of lack of control of the commune concerning the individual system entities, activities of the national regulator, i.e. the **Energy Regulatory Office** as well as the diversity of administrative-legal structures operating within the system. The possibility of developing the energy sector administration in the commune based on rational energy use and utilisation of the local energy resources are the main outcomes of drafting such plans. Managing the energy sector in the commune should be based on 4 pillars representing the following areas: the energy policy of the commune, energy sector principles, energy sector infrastructure and organisational-financial forms as represented in figure 3.

The energy policy of the commune is based on the fundamental guidelines concerning the energy sector development contained in the European Union energy policy, domestic policy as well as the legal acts on the basis of which the plans for supplies with fuels, power, heat and gas are drafted. Drafting the plan of resource use concerning the renewable energy sources and elaboration of the investment policy represent important issues.

Communal energy resourcesrefer to the available as well as unidentified resources with particular focus on renewable energy sources. According to the adopted EU energy policy, high importance is currently attributed to the renewable energy sources that are frequently available to the communes. The basic ones include resources of wind energy, hydro energy, geothermal energy and biomass.

Energy infrastructure refers to the energy sector enterprises operating within a given area as well as the length and density of the energy networks. The infrastructure saturation of the commune allows more effective energy management by establishing strong systems.

Administrative-legal formsin the energy sector are usually represented by capital companies in the power sector and the heat sector. The commune

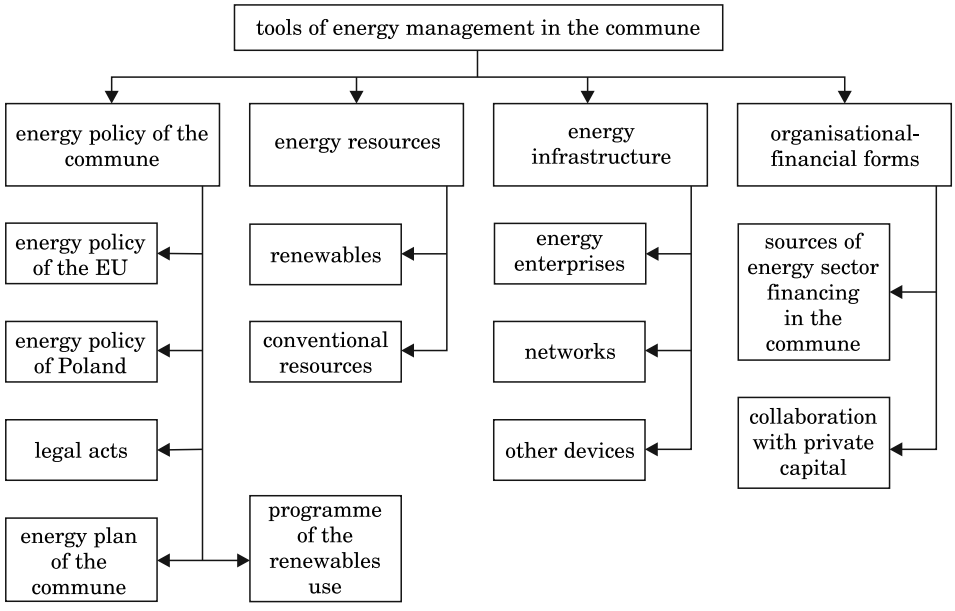


Fig. 3. Tools of energy management in the commune

Source: own work.

Table 2

Indicators characterising the local energy system

Indicator	Measure
Energy consumption structure	Share of the individual energy sources in the total energy consumption structure in %
Energy consumption in the commune	Energy consumption per resident
Energy consumption per capita	kWh/year GJ/year
Energy consumption by economic entity	kWh/year GJ/year
Average unit price of: – electricity, – heat.	 PLN/kWh PLN/GJ
Energy intensity of local economy	KWh/PLN
Air pollution emissions from energy generated	kg/kWh

Source: own work.

usually has the largest potential in ownership and management of heat energy sector companies while it has no influence on the power sector, where private companies dominate. Privatisation of the sector is the dominating market trend.

The energy system of a given commune may be characterised using qualitative and quantitative indicators, thanks to which it is possible to plan changes and evaluate them over time. The selected energy system indicators are presented in Table 2.

Commune energy resource management is based on using a number of instruments of a financial and administrative nature. The choice of individual components is presented in Fig. 5.

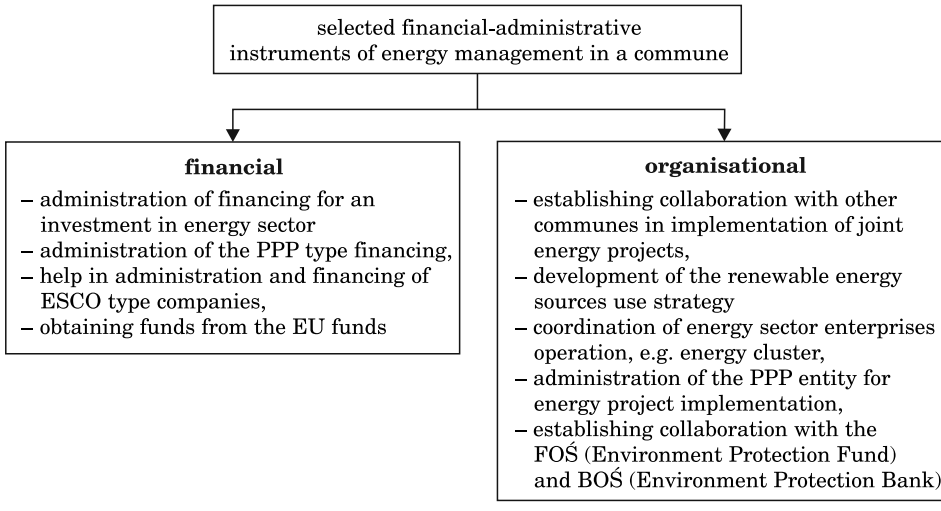


Fig. 5. Energy management instruments

Source: own work.

In addition to drafting the documents resulting from the national documents or European directives, the commune should support measures in the financial-administrative field by obtaining funds as well as creating structures allowing effective use of them. The capital intensity of investments in the energy sector requires the communal governments to search for partners for joint projects from both the territorial government field, such as the neighbouring commune, and from the private sector – offering collaboration according to the public-private partnership formula.

ESCO model in rationalisation of energy consumption in the commune

The abbreviation „**ESCO**" (Energy Service Company) represents a company offering comprehensive expert services in the energy sector through warrants to potential clients for saving energy and decreasing energy costs.

The contract made is an "outcome contract" which covers obtaining the energy outcome or another parameter specified in the contract. ESCO operation is treated more as a service activity, where all the modernisations implemented are treated as means for obtaining energy savings.

The ESCO invests its funds in the client's assets by implementation of the measures related to decreasing the consumption or/and costs of energy production. This activity is supported by energy audits encompassing the analysis optimising the recommended technical measures for energy consumption limitation. After conducting the modernisation works, the actual energy costs for the client are decreased as compared to the situation preceding the modernisation. The client, on the other hand, agrees to pay for the energy at an unchanged level for a specified period of time. This period is referred to as the outlay return period. Its length depends on the technical-economic parameters of the individual projects and, in particular, the relation between the outlays incurred and the savings obtained. The model for ESCO-type project implementation is presented in figure 6.

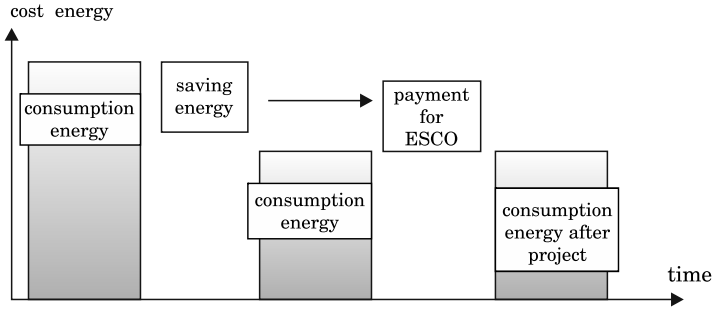


Fig. 6. ESCO model
Source: own work based on JANKOWSKI (2008, pp. 37–39).

The fact that the savings generated as a result of the project implementation, as compared to the baseline from before the modernisation, will be paying off the outcomes incurred during a specified period of time, is a characteristic of financing according to the ESCO formula. Thanks to that, the client does not bear any costs related to the project at the beginning of project implementation and has the certainty that after completion of the modernisation works, the sum of payments for the energy and payoff of the investment outlays will not exceed the level from before the modernisation. An example here is the operation of the ESCO established by the MPEC (Municipal Heating Company) in Kraków[3].

[3] The Energy Saving Company ESCO LLC (POE ESCO) was established in April 2000. The MPEC S.A. in Kraków is the sole owner of the ESCO, www.esco.krakow.pl

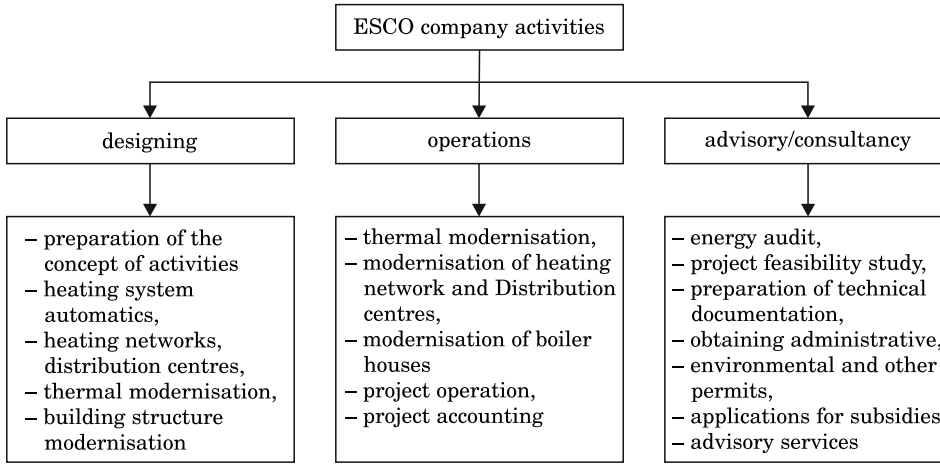


Fig. 7. ESCO company scope of activities

Source: own work.

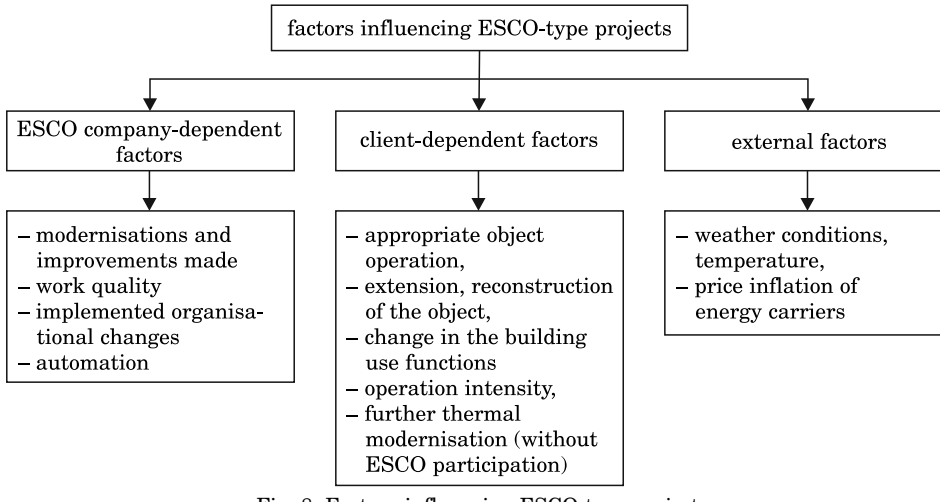


Fig. 8. Factors influencing ESCO-type projects

Source: own work.

The basic scope of works and modernisations in buildings in the case of projects implemented according to the ESCO formula is as follows:

– modernisation of the existing heat distribution centres and boiler houses,
– modernisation and installation of central heating installations,
– automation of energy generation and distribution systems,
– installation of hot water installation and liquidation of gas boilers,
– thermal insulation works,

– replacement and tightening of windows,
– projects concerning hot water consumption,
– projectsconcerning use of alternative and renewable energy sources.

In case of the ESCO-type projects, high importance is attributed to the factors on the client side concerning the appropriate use of the object following the project.

Wind energy as an instrument of the energy policy of the commune

Wind energy is a major renewable energy source and it is considered environmentally clean (disregarding the energy input for building the wind power plant) because energy generation does not require the combustion of any fuel. In Poland, wind energy has been developing for some years. The first wind turbine was installed in 1991 next to the earlier existing power plant in Żarnowiec, in Pomerania. Saturation with wind power plants in Poland is among the lowest in Europe. The capacity installed in wind power generation per capita is to 0.012 kW while per 1 km^2 of land surface it is 1.44 kW (Tab. 3).

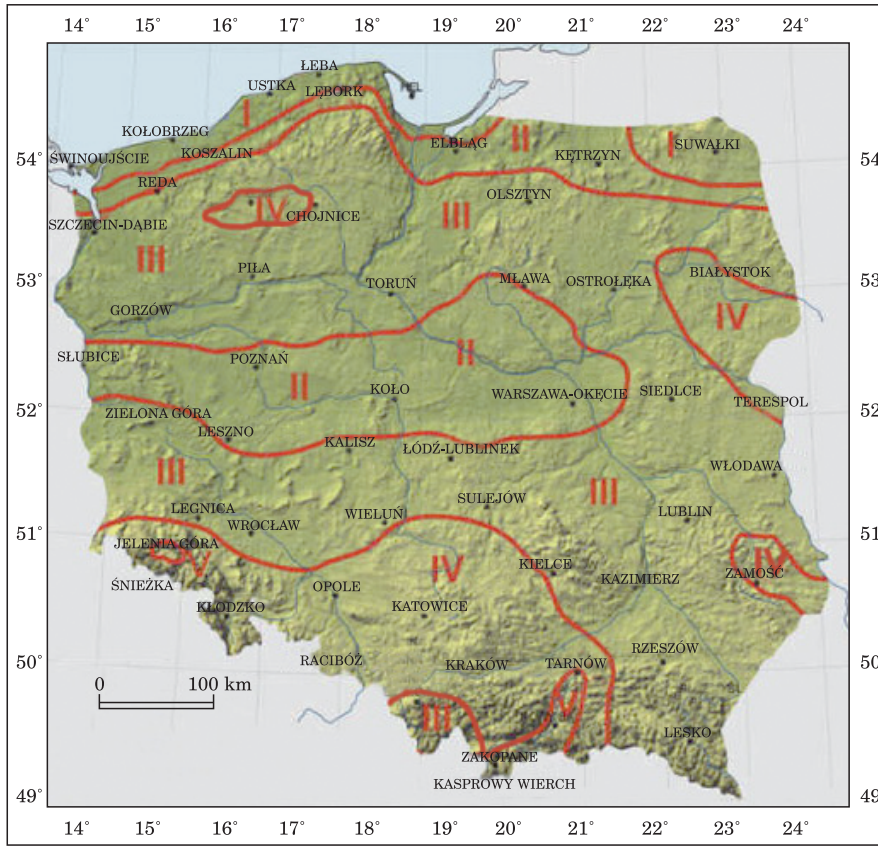
Table 3

Wind energy production in Poland

Year	Energy generated	Dynamics (in %)	Share of wind energy in total energy consumption (in %)
2004	142.3 [GWh]	100	0.10
2005	135.3 [GWh]	95.1	0.10
2006	388.4 [GWh]	272.9	0.28
2007	494.2 [GWh]	347.3	0.35
2008	790.2 [GWh]	555.3	0.55
2009	1 029 [GWh]	723.1	0.76
2010	1 485 [GWh]	1043.6	1.06
2011	1616 [GWh]	1135.6	1.14

Source: own work based on the GUS 2010.

The most favourable wind resources according to the Institute of Meteorology and Water Management are available in the central part of the seashore, in the Suwałki area, in central Wielkopolska and Mazowsze, Beskid Śląski and Żywiec area, Bieszczady and the Dynów Heights (Fig. 9).



Zones: I – very favorable, II – favorable, III – sufficient, IV – insufficient, V – bad

Fig. 9. Wind energy zones in Poland
Source: Institute of Meteorology and Water Management, 2010

It is an undisputed fact that obtaining wind energy has a positive influence on the natural environment by limiting the emissions of pollutions produced during energy generation from conventional sources (mainly by the combustion of coal) and some unconventional sources (as in the case of nuclear power). According to the data of the European Union Energy Committee (Thermie programme), the installation of a single wind power plant with a capacity of 300 kW allows reducing the yearly production of pollution by 4–7 tons of sulphur dioxide, 3–5 tons of nitrogen oxides, 500-1000 tons of carbon dioxide and 30–60 tons of ash.

It is estimated that generating 1 MW of energy at a grid power plant brings environmental damage totalling PLN 133 (at 1995 prices) and PLN 560 (at

2006 prices). A wind power plant with the capacity of 12 MW (6x2 MW) with the average yearly production of 30,000 MW offers savings amounting to ca. PLN 16,389,000. Considering the fact that the estimated operational life of the power plant is 20–25 years, the total savings can be estimated at PLN 385–500 million during the power plant lifetime (Ligus 2010, pp. 14–20).

Conclusion

Implementation of a local energy policy is a big challenge for a commune government, but at the same time it offers great benefits. The **challenges** caninclude:

– organisation of competent services to implement the local energy policy by drafting the plans and programmes,

– promotion of projects and innovative measures of a holistic and long-term character aiming at energy efficiency improvement, involving local communities in its implementation,

– creating in their own strategic documents the conditions supportive for local energy security improvement, energy infrastructure development, energy efficiency improvement and intensification of renewable energy source use,

– skills in actively developing and making use of the free energy market,

– creating platforms for all energy market users for rationalisation of energy use.

The **benefits** that the commune may achieve by long-term strategic energy sector management are:

– limitation of the operational costs related to public utility facilities and operation of commune-dependent entities,

– increase in the energy security level with the existing systems of supply with energy media,

– decreasing emissions representing a burden to the natural environment,

– limitation of conventional energy use and, as a consequence, leaving larger reserves of fuel for future generations,

– energy use efficiency improvement for premises that are controlled by the commune as well as those managed by other entities,

– increased use of energy from renewable sources.

Optimal use of the benefits resulting from involvement in this difficult area of commune activities requires specifying the measures which must be taken to achieve the defined goals:

– managerial measures, requiring no investments aiming at rational energy use in premises controlled by the commune (ESCO-type projects),

– consideration of energy-saving solutions at the stage of new investment project development,

– Implementation of so-called green procurement as concerns equipping the communal facilities with energy-saving electrical equipment and devices,

– educational activities for the entire local community, starting with school-age children,

– measures supporting the development of the competitive energy market,

– collaboration with scientific and industrial communities.

Finding administrative-legal solutions to provide energy security for the commune, while maintaining an appropriate quality of services through optimisation of costs, is an important issue. Planning and organisation of the demand for power are, according to the Energy Law Act, among the responsibilities of the commune. In this context, collaboration which is not only institutionalised, but also less formal, takes on greater importance. The President of the Energy Regulatory Office serves to support all forms of collaboration between bodies, public institutions and other entities, e.g. in the PPP form that aims at energy security improvement. The President of the Energy Regulatory Office is a major pillar of support for local and regional authorities for new and existing energy initiatives. Measures promoting rational energy management at the local level will be continued and developed by the Energy Regulatory Office.

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CONVERGENCE PROBLEMS IN THE EUROZONE

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K e y w o r d s: Eurozone, convergence criteria, optimum currency areas, Stability and Growth Pact.

A b s t r a c t

This paper analyses the issue of convergence in the Eurozone. The overarching objective was to evaluate the monetary and fiscal convergence of the countries in the Eurozone during the recent period. A further goal was to establish recommendations boosting the economic efficiency of the analysed currency integration of the Eurozone. The paper pinpoints crucial theoretical underpinnings and the current analysis of the Eurozone. Empirical data pertinent to macroeconomic indicators, which were collated and statistically analysed, were also used to delineate crucial issues of convergence in the Eurozone.

PROBLEMY KONWERGENCJI W STREFIE EURO

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S ł o w a k l u c z o w e: strefa euro, kryteria konwergencji, optymalne obszary walutowe, Pakt stabilności i wzrostu.

A b s t r a k t

Problemy funkcjonowania strefy euro, wynikające z braku dostosowywania się jej członków do kryteriów konwergencji uzgodnionych w traktacie z Maastricht, stanowią ważny obszar badawczy w ramach międzynarodowej integracji gospodarczej na etapie unii walutowej. Celem podjętych badań była ocena dotychczasowej konwergencji monetarnej i fiskalnej państw obszaru waluty euro oraz próba sformułowania zaleceń umożliwiających zwiększenie efektywności ekonomicznej analizowanej integracji walutowej. W ramach badań przeprowadzono studia literaturowe obejmujące zarówno dorobek teoretyczny na temat optymalnych obszarów walutowych, jak i bieżącą analizę funkcjonowania strefy euro. Na podstawie danych wtórnych dotyczących makroekonomicznych wskaźników ujętych w kryteriach konwergencji, które uporządkowano i poddano analizie statystycznej, sformułowano główne obszary problemowe konwergencji w Eurolandzie.

Introduction

Implementation of the monetary union within the European integration has been a lengthy process and requires thorough preparation to achieve success. The increasing economic interdependence of the European Union (EU) countries has contributed to harmonisation of their market cycles, which, in the light of the optimum currency area theory, represents one of the major premises for creating monetary unions. However, the criteria of monetary and fiscal convergence criteria formulated in the Treaty of Maastricht that represented the conditions for participation in the Eurozone (Euroland) has not always been observed from the very beginning of its existence. During the following years, that negative practice was continued.

Faced with permanent non-compliance with the key principles for the functioning of the Eurozone, the answer to the question concerning improvement in the mechanism of its operation, particularly under the crisis conditions, seems particularly relevant. Different corrective scenarios can be considered, including: reformulation of the criteria for participation in the Eurozone, establishing special funds for securing the stability of the zone, a more restrictive system of controls and sanctions concerning compliance with the Maastricht criteria (including even exclusion of a state from the zone) or – in extreme cases – withdrawing from further implementation of monetary union in the EU.

Presenting the difficulties in the Eurozone operation resulting from non-performance of the agreed programme of monetary and fiscal convergence by Member States was the main objective of the conducted studies. The authors of the paper attempted to formulate answers to the questions concerning the consequences of such practices on the grounds of the optimum currency area theory and the possible measures to obtain larger economic benefits at this stage of economic integration.

Methodology of studies

The nominal convergence of the Eurozone Member States resulting from the criteria formulated within the frameworks of the Treaty of Maastricht, which was signed in 1992 (effective date 1.11.1993), was the subject of the studies. The time scope of the analysis undertaken encompassed the period from 1998, i.e. the evaluation of convergence of the initial members in the Eurozone, until 2010 when the decision was taken on accepting the 17th member of the zone – Estonia.

The literature study was the first stage of the research. The focus was on

the concept of implementation of the monetary union as one of the stages in the international economic integration. Particular attention was devoted to the optimum currency areas theory – in both the initial version developed by Mundell and its later modifications. Moreover, the existing scientific resources concerning the current operation of the monetary union within the EU were subject to a critical review.

During the next research stage, the available secondary data were used. The data concerned macroeconomic indicators included in the convergence criteria within the frameworks of the Eurozone. Databases of the Eurostat and the European Central Bank were used as the data sources. The secondary material obtained was processed and presented using the descriptive statistics methods in the form of tables and graphic presentation of the results.

The outcomes of the conducted research formulated within the summary and conclusions are presented in the last part of the paper.

Results of studies

For years, a discussion has been pending in the subject literature concerning the benefits and costs resulting from applying the common currency. Different criteria have been defined on which the choice of the exchange rate system optimal for a given economy depends. Robert Mundell was the first to describe this phenomenon, naming it the "optimum currency area" theory. The optimum currency area is a region in which a single currency or many currencies with fixed exchange rates are circulated (MUNDELL 1961, p. 658). Within the optimum currency area, the benefits of possessing a common currency or applying fixed currency exchange rates exceed the costs of such a solution. Consequently, it is optimum for the countries forming an optimum currency area to accept a common currency, while in relations with the countries from outside the optimum currency area it is recommended to apply the flexible exchange rates (TCHOREK 2010, p. 41). Resignation from the right to issue one's own currency involves certain costs. Consequently, satisfying the specified conditions is necessary if establishing the monetary union is to mean increased wealth for a given country – which is the fundamental aim of economic integration at that stage.

As the risk of appearance of asymmetric shocks is the fundamental problem in the functioning of monetary unions, the optimum currency area theory focuses on the factors that minimise that risk (Tab. 1). According to the definition, an asymmetric shock occurs when changes in demand and supply influence one or several countries more extensively than the other countries (ROGUT 2010, p. 214). The presented factors focus mainly on the degree of

Table 1

Criteria of the traditional theory of optimum currency area

Factors decreasing the costs of abandoning the exchange rate and monetary policy	
Low susceptibility of the economy to shock (*symmetry*):	ability of the economy to absorb shocks (*flexibility*)
Correlation of the market cycles Similarity of the inflation rates Diversification of production	flexibility of wages and prices mobility of production factors integration of the financial markets fiscal integration
Degree of openness of the economy	

Source: TCHOREK 2010, p. 46.

convergence and integration of economies. The higher it is, the less susceptible the member states are to asymmetric shocks. They also have a higher capacity to absorb them. Additionally, the important role of the diversification of production by the individual countries and flexibility of their labour markets are highlighted, with particular consideration for the mobility of labour within the integrated region.

Concerning fiscal integration, the linked problem of political integration also appears. According to the theory, creating a monetary union budget, which, similar to the national budgets, would play the role of the intervention tool in case of asymmetric shocks, would be the optimal solution. However, if such a budget were to be effective, it would have to have significant funds available (e.g., the domestic budgets frequently exceed one-third of the GDP of the country), which under conditions of economic integration would be difficult, or even impossible, to achieve. It should be highlighted that the current EU budget does not fulfil a regulatory function. Additionally, it has relatively low funds available, oscillating around 1% of the GNI of all the European Union countries.

Studies conducted during the 1990s did not clearly show that the European nion satisfied the principles of the optimum currency area and, consequently, implementation of a common European currency was justified. Numerous economists were even convinced that the entire contemporary EU-15 was not an optimum currency area and that only some selected countries of it formed one (DE GRAUWE 2003, p. 93). This means that even at that time, the ambitious project of the Eurozone was rated, from the economic perspective, negatively to a certain extent. It seems that in its implementation, a major role was played by political ambitions in the leading European Union countries and institutions.

A slightly different approach to the consequences of monetary integration has been brought about by the concept of the new theory of optimum currency

area, which highlights the benefits of possessing a common currency while marginalising its costs (MONGELLI 2002, p. 8). This attitude resulted from the following premises:

a) marginalisation of the monetary policy role as a tool for long-term regulation of the economy,

b) belief that the use of the exchange rate mechanism may result in major deviations in the economy and, consequently, may be the cause of an economic shock,

c) emergence of an endogenous effect resulting from the monetary union and, consequently, an increase of integration and macroeconomic stability in the member states.

A particularly important role should be attributed to the concept of the endogenous nature of the optimum currency area that was popularised by Jeffrey Frankel and Andrew Rose. They highlighted that intensified trade exchange between countries supports correlation of their market cycles (FRANKEL, ROSE 1996, pp. 21-22). As the outcome, the economic integration advancement at the monetary union level causes economic synchronisation of an area linked together by a common currency and consequently levels the risk of the appearance of asymmetric shocks. The levelling of the prices in the individual countries is particularly well- visible and has been empirically proven in the Eurozone countries (DE GRAUWE, MONGELLI 2005, pp. 16–17). Consequently, the intensity of trade integration, as well as the correlation of market cycles of a candidate to the monetary union, may change under the influence of implementing the common currency. This means that accession to the monetary union may influence the degree to which a given country satisfies the criteria of the optimum currency area. Hence, even if a country does not satisfy those criteria *ex ante*, it may satisfy them after accession to the union and, consequently, the evaluation of whether a country is a good candidate for the monetary union based exclusively on the historical data might be misleading.

Implementation of the monetary union stage in the countries of the European Communities started during the 1970s with the Werner plan. (ZOMBIRT 2008, p. 490). However, the stormy changes taking place in the global economy of those days resulting mainly from the collapse of the Bretton Woods exchange rate system and the fuel crisis contributed to the necessity of resignation from the ambitious plan of rapid implementation of the common European currency. The establishment in 1979 of the European Monetary System (EMS), which was based on the European Currency Unit (ECU) – a quasi-currency based on the basket of currencies of the current nine members of the Communities – represented the next step towards monetary union. In addition to the important role in the settlements within the EC (e.g.

between the central banks or accounting for the budgets) and in the international financial market, the ECU became the nucleus for the future common means of tender of the united Europe – the euro. The EMS played also the function of an important institutional experience for the European Central Bank and the European System of Central Banks currently operating.

The Treaty of Maastricht was of key importance for the establishment of the Eurozone (WIKTOR 2005, p. 192). It outlined a binding economic doctrine indicating the conditions for the optimum currency area functioning and, consequently, the willingness to achieve the highest benefits possible from the introduction of the single currency in the EU. The list of criteria that had to be fulfilled by the candidates to the membership in the monetary union among the current and future EU countries was formulated[1]. In article 140 of the Treaty of Maastricht, three criteria related to the monetary policy and two concerning the fiscal policy were formulated:

1) inflation may not exceed the average inflation from the three EU Member States with the most stable level of prices by more than 1.5 p.p.;

2) the long-term interest rates may not exceed the average level of such rates from the three EU Member States with the most stable level of prices by more than 2 p.p.;

3) the currency of the candidate to the Eurozone must participate in the ERM II system for at least 2 years without the possibility of devaluating its exchange rate;

4) the budget deficit may not exceed 3% of the GDP;

5) the public debt should not exceed 60% of the GDP and a country that is not able to satisfy that condition should show a decreasing debt level trend, which would allow attainment of the required cap.

The formulated convergence criteria, combined with the high level of economic interdependence of the EU countries achieved during 40 years of European integration were to guarantee the effective – from the economic perspective – functioning of the euro as a currency, offering benefits to all the countries of the zone. However, the problem with observation of the criteria set in that way and the absence of clear institutional mechanisms allowing their enforcement became obstacles to the target outlined in that way. It seems that as a consequence of absence of the advanced integration of the EU countries in the political dimension, it was extremely difficult to reach an agreement

[1] Two of 12 countries that signed the Treaty of Maastricht, secured themselves (within the frameworks of the so-called opt-out clause) the possibility of staying outside the Eurozone. Those were Denmark and the United Kingdom. On the other countries, as well as the future EU members, the duty of implementing the euro as currency was imposed (this also applies to Poland). The date, however, for implementation of the common currency was not determined. It is assumed that this should take place when all the criteria of convergence formulated in the Treaty of Maastricht are satisfied.

concerning sanctions, including exclusion from the Eurozone, for the countries not satisfying the requirements formulated. Additionally, many countries treated the criteria of Maastricht as the conditions of entry into, and not the conditions of participation in, the monetary union and, immediately after joining the Eurozone, their macroeconomic indicators started deviating from the allowed standards. It should also be highlighted that much greater problems concerned maintaining convergence in the budgetary policy, which have recently surfaced during the global economic crisis.

Table 2

Performance of convergence criteria in the EU-15 countries in 1998

Item	HICP inflation	Long-term interest rate	Budget deficit	Public debt
Reference value	2.7%	7.8%	-3%	60%
Belgium	1.4	5.7	-1.7	**118.1**
Germany	1.4	5.6	-2.5	**61.2**
Spain	1.8	6.3	-2.2	**67.4**
France	1.2	5.5	-2.9	58.1
Ireland	1.2	6.2	1.1	59.5
Italy	1.8	6.7	-2.5	**118.1**
Luxemburg	1.4	5.6	1.0	7.1
Netherlands	1.8	5.5	-1.6	**70.0**
Austria	1.1	5.6	-2.3	**64.7**
Portugal	1.8	6.2	-2.2	60.0
Finland	1.3	5.9	0.3	53.6
Greece	**5.2**	**9.8**	-2.2	**107.7**
Denmark	1.9	6.2	1.1	59.5
Sweden	1.9	6.5	0.5	**74.1**
United Kingdom	1.8	7.0	-0.6	52.3

Source: Own work based on the: Convergence Report 1998. European Monetary Institute, Frankfurt/Main.

Consent for accession to the Eurozone on the date of its establishment – 1.01.1999 – of the countries that did not satisfy the budget discipline requirements represented an additional factor that showed that fulfilment of the convergence criteria may be violated without punishment (Tab. 2). Out of the 11 initial Member States of the zone, only 5 satisfied the agreed level of public debt. It should be highlighted that two countries – Belgium and Italy – exceeded the allowed debt value by two-fold meaning that it was neither an incidental nor a short-term phenomenon. Consequently, the situation provided an excuse for the other countries not to strictly observe fiscal policy discipline in the future.

Satisfactory convergence results were attained during the studied period when the responsibility for monetary policy was transferred from the level of the Member States to the Community level (in particular, the European Central Bank). The increased inflation (relative to the reference value) appeared only at the initial period of the zone functioning – during the years 1999–2000 – and as a consequence of the global economic crisis of 2009–2010 (Eurostat 2011). Additionally, the values were not vary high, they were of a provisional nature and in most cases applied to some countries only (particular problems with inflation were recorded in Greece).

The Stability and Growth Pact adapted in 1997 became an attempt at maintaining the budgetary convergence necessary to assure stability of the common currency and prevent excessive loosening of the fiscal policy (*Raport*... 2009, p. 17). It encompasses three documents: the Resolution of the European Council (taken at the summit in Amsterdam on 17 June 1997) and two Council Regulations ECOFIN (1466/97 and 1467/97). The mechanism of control and strengthening fiscal discipline within the framework of the Pact is implemented using three groups of instruments: a system of multiple surveillance and control of situation in the individual countries, the fiscal rules in the form of the defined quantitative limits and orders concerning the deficit and public debt and the detailed operational development of the excess deficit procedure. The Pact, however, has been evaluated by the Union countries as controversial – highly restrictive and intervening strongly in the political autonomy of the individual countries (MARINHEIRO 2008, p. 189). Additionally, while the Eurozone countries were deprived of their own monetary policies, the fiscal policy was the sole macroeconomic instrument allowing mitigation of asymmetric shocks (ROSATI 2010, p. 615). The proposals were even formulated to accept the increased the budget deficit of countries in situations when the government expenditures were rational or the country found itself in a difficult economic situation (WYPLOSZ 2005). Consequently, during its entire history, the public debt of the Eurozone exceeded the fixed 60% of the GDP while the allowed value of budgetary deficit was exceeded during bad market periods – in 2003 and during the years 2009–2010 (Fig. 1). Loosening of fiscal policies during the global financial crisis of the end of the first decade of the 21st c. is particularly clear. During that time, the public debt in the Eurozone exceeded 80% of the GDP while the budget deficit exceeded 6% of the GDP.

The problems of fiscal convergence in the Eurozone have been differentiated clearly from a geographic perspective from the very beginning of its existence. Only two countries – Finland and Luxemburg – have satisfied the budget discipline assumptions formulated in Maastricht across the entire period. The remaining Member States, including the leading economies of the monetary union: Germany, France and Italy, exceeded the set criteria notori-

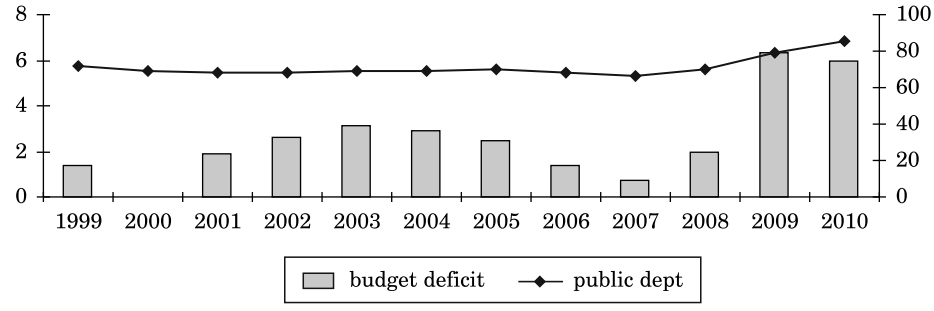

Fig. 1. Budget deficit and public debt in the Eurozone 1999–2010
Source: Own work based on the Eurostat data
(http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home, read on 28.06.2011).

ously and significantly. Greece has had the largest scale of fiscal divergence, which, since its accession to the Eurozone, has not even come close to budget deficit or public debt reference values[2] (Tab. 3). Consequently, in 2010, Greece reached the limit of solvency and without financial aid from the EE countries and the International Monetary Fund it would have gone bankrupt. The situation of Greece found evident negative reflection in the confidence in the euro as a currency and further in its exchange rate stability in the global financial market. Hence, non-compliance with the agreed budgetary regime has numerous consequences: domestic economic destabilisation in a country that runs the expansive fiscal policy; undermining the credibility of the common currency and consequently possible perturbations in the other economies of the zone and, finally, lack of reaction to systematic non-compliance with the principles of "healthy" public finance causing difficulties in building a strong European currency.

In the proposed Eurozone management reform proposals, much focus is placed on penalising countries that do not apply the criteria of Maastricht and a relatively minor role is attributed to the preventive measures that would allow avoiding such strong fiscal divergence in the future (DE GRAUWE 2011, s. 18). It should be remembered that the fact that the member state create debts in the currency of which they have no direct control is the fundamental problem of the monetary union Member States. This is the consequence of the current institutional situation in the Eurozone – the combination of monetary policy centralised around the European Central Bank and the fiscal policy conducted independently by each of the countries (VON HAGEN, WYPLOSZ 2008,

[2] Following accession of Greece to the Eurozone in 2001 it was found out that the earlier statistics for that country concerning the macroeconomic indicators were adulterated for the purpose of satisfying the criteria for membership in the monetary union.

Fiscal convergence in Eurozone

Table 3

Item	2000		2003		2007		2010	
	budget deficit, % GDP	public debt, % GDP	budget deficit, % GDP	public debt, % GDP	budget deficit, % GDP	public debt, % GDP	budget deficit, % GDP	public debt, % GDP
Reference value	-3.0	60	-3.0	60	-3.0	60	-3.0	60
Belgium	0.0	**107.9**	-0.1	**98.5**	-0.3	**84.2**	**-4.1**	**96.8**
Germany	1.3	59.7	**-4.0**	**63.9**	0.3	**64.9**	**-3.3**	**83.2**
Ireland	4.7	37.8	0.4	30.9	0.1	25.0	-32.4	96.2
Greece*	-3.7	103.4	**-5.6**	**97.4**	**-6.4**	**105.4**	**-10.5**	**142.8**
Spain	-1.0	59.3	-0.2	48.7	1.9	36.1	-9.2	60.1
France	-1.5	57.3	**-4.1**	**62.9**	-2.7	**63.9**	**-7.0**	**81.7**
Italy	-0.8	**109.2**	**-3.5**	**104.4**	-1.5	**103.6**	**-4.6**	**119.0**
Finland	6.8	43.8	2.4	44.5	5.2	35.2	-2.5	48.4
Luxemburg	6.0	6.2	0.5	6.1	3.7	6.7	-1.7	18.4
Netherlands	2.0	53.8	**-3.1**	52.0	0.2	45.3	**-5.4**	**62.7**
Austria	-1.7	**66.5**	-1.5	**65.8**	-0.9	**60.7**	**-4.6**	**72.3**
Portugal	-2.9	48.5	-3.0	55.9	**-3.1**	**68.3**	**-9.1**	**93.0**
Slovenia*	-3.7	no data	-2.7	27.3	-0.1	23.1	**-5.6**	38.0
Malta*	-6.2	55.9	-9.9	69.3	-2.4	62.0	**-3.6**	**68.0**
Cyprus*	-2.3	58.8	-6.5	68.9	3.4	58.3	**-5.3**	**60.8**
Slovakia*	-12.3	50.3	-2.8	42.4	-1.8	29.6	**-7.9**	41.0

* Greece became a Eurozone member in 2001, Slovenia in 2007, Malta and Cyprus in 2008, and Slovakia in 2009.

Source: Eurostat data (http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home, access on 28.06.2011)

p. 18). Moreover, one should be aware that a significant part of the debts that became the essence of the economic crisis in the Eurozone initiated in 2009 concerned private entities (DE GRAUWE 2010, s. 2). Consequently, reforming or granting the European Union entities more power to i enforce the Stability and Growth Pact might prove ineffective. Ideas have also been floated on changing the convergence criteria or to apply a more flexible interpretation of them, also in case of the new Member States. However, such an approach has resulted in negative reactions from both the EU institutions and the Eurozone Member States as the risk exists that loosening the Maastricht criteria would weaken the credibility of Eurozone and its institutional foundations (JONAS 2006, p. 328).

The absence of a common budget of the Eurozone countries that would fulfil the regulatory role in the situations of bad economic market represents an additional factor hindering the functioning of a single currency area. The

European Stability Mechanism established in May 2010, requires that the EU countries, together with the European Commission, until 2013 shall allocate 500 billion euro, i.e. around 6% of the GDP of the Eurozone to offer a solution. This aid is to be offered in the form of both a credit line and credit guaranties (SIEMIONCZYK et al. 2010).

The labour market flexibility and the mobility of labour within the monetary union area represent an important aspect highlighted by the classic theory of the optimum currency area. In the case of the EU countries (both at the beginning of the Eurozone and today) those conditions have been satisfied only to a minor extent. Although one of the major principles of the common market, the principle of free flow of labour, has been in operation for years, the European Union labour market is characterised by a lack of homogeneity that is manifested in the diversified employment structures, unemployment rates, wages, pension systems, etc. This diversification was clearly evident during the last economic crisis in the form of the different labour market reactions to the situation in different countries of the EU (BRUHA et al. 2011, p. 19). Moreover, this market is characterised by a very low level of migration – in 2000 only 0.1% of the EU-15 population changed their place of residence (for comparison, in the US in 1999, the equivalent value of migrations between States was 5.9%) (HEINZ, WARD-WARMEDINGER 2006, p. 7). The presented state of the EU labour market makes it hard to expect that in the case of asymmetric shocks emerging within the Eurozone, this market would fulfil a stabilising role.

Conclusion

Construction of the single currency area in Europe currently encompassing 17 EU countries has proved a difficult task that has not been attained entirely successfully. Preparations for implementing the euro as a currency based on extensive theoretical resources concerning the optimum currency area should be evaluated positively. Both the institutions established to conduct the monetary policy in the Eurozone and the Eurozone membership criteria have satisfied the guidelines conditioning the success of this undertaking. However, the consent for participation in the euro project of countries which from the very beginning did not comply with the agreed principles or started violating them immediately after accession to the Eurozone was a problem that hindered implementation of the plan. Such behaviours did not meet with an effective reaction from the EU institutions. Both a system of appropriate sanctions and preventive measures were missing. Consequently, a significant divergence occurred, particularly in the fiscal policy, which combined with economic recession initiated in Europe in 2009, brought dangerous instability

to the economies of some of the Eurozone countries. The difficulties encountered by the European Central Bank in implementation of the monetary policy deserve particular highlighting as under conditions of not maintaining the fiscal convergence in the Eurozone it has no possibility of taking decisions that are optimal (for all the zone members). Moreover, the Eurozone was deprived of two factors that contribute significantly to protection against asymmetric shocks, i.e. a flexible and mobile labour market as well as a budget allowing intervention in the euro market in poor market situations.

The present problem in the functioning of the Eurozone is caused, to a significant extent, from insufficient political integration of the European Union and, consequently, difficulties in governing the Eurozone. It is estimated that the EU is currently at the point where a decision has to be taken as concerns the further direction of its development: strengthening the integration and increasing the EU effectiveness as an important global player, rationalisation of the Union integration and fragmentation process or continuation of the focus on the internal community market (BARCZ 2008, s. 28–33). Stronger cooperation of only those countries of the EU that possess the euro is also possible. Given the current experience in the functioning of the Eurozone, it can be concluded that only an intensification of cooperation would allow achievement of benefits from a monetary union by all of its members. Only strong and effective Eurozone management will secure exchange rate stability and build up the credibility of the euro in the long-term. In other cases, it may be the case that from an economic perspective, a return to national currencies or a limitation of the number of Eurozone members will be more effective.

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