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TABLE OF CONTENTS

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CONTROVERSIES ON THE ECONOMIC EFFECTS OF FIXED – TERM EMPLOYMENT – EVIDENCE FROM THE OECD COUNTRIES*

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K e y w o r d s: fixed-term employment, employment elasticity, contractual labour market segmentation.

A b s t r a c t

This paper focuses on fixed-term employment in the OECD countries, its trends and conditions, as well as controversies regarding its significance for flexibility of employment and labour market segmentation.

Statistical data show that fixed-term employment significantly increased its share in total employment in many OECD countries in the last quarter century. The reasons of this trend can be sought in the lower labour cost of this type of employment, and the ease with which this group of employees can be dismissed, which was in part a result of the relaxed legal protection of fixed-term employment in the nineties. Analyses indicate that the increase in the share of fixed-term employment affect employment elasticity nonlinearly according to the shape of the letter U. The analyses support the hypothesis about the segmentation of the labour market as a result of the development of fixed-term employment.

KONTROWERSJE WOKÓŁ EKONOMICZNYCH SKUTKÓW ZATRUDNIENIA NA CZAS OKREŚLONY – ANALIZA NA PRZYKŁADZIE KRAJÓW OECD

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S ł o w a k l u c z o w e: zatrudnienie na czas określony, elastyczność zatrudnienia, kontraktowa segmentacja rynku pracy.

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Abstrakt

Przedmiotem artykułu jest zatrudnienie na czas określony w krajach OECD, jego tendencje i uwarunkowania, a także kontrowersje dotyczące jego znaczenia dla elastyczności zatrudnienia oraz segmentacji rynku pracy.

Dane statystyczne pokazują, że zatrudnienie na czas określony znacząco zwiększyło swój udział w ogólnej liczbie zatrudnionych w wielu krajach OECD w ostatnim ćwierćwieczu. Przyczyn tej tendencji można doszukiwać się w niższych kosztach pracy tego zatrudnienia, łatwości zwolnień z pracy takich pracowników, a także liberalizacji prawnej ochrony zatrudnienia na czas określony w latach dziewięćdziesiątych. Przeprowadzone analizy wskazują, że wzrost udziału zatrudnienia na czas określony wpływa na elastyczność zatrudnienia nieliniowo, zgodnie z kształtem litery U. Analizy potwierdzają hipotezy o segmentacji rynku pracy w rezultacie rozwoju zatrudnienia na czas określony.

Introduction

The economic analysis of the labour market is dominated by aggregate approach involving the use of macroeconomic aggregates for the whole economy, such as employment, unemployment or the economically active population. Their popularity is due to their high analytical usefulness. This approach allows identifying a number of important processes occurring in the labour markets, concerning both the trend changes of basic values as well as the relationship between them. Next to the essential advantages, the aggregate approach, however, has limitations and also weakness primarily consisting in that it does not allow us to penetrate into the internal structure of the examined aggregates. These weaknesses manifest themselves particularly clearly when the examined aggregates are internally heterogeneous. This occurs among other things, for such an aggregate as employment, which is the focus of the analysis of this paper. Therefore, the analysis based on the disaggregation of this variable should contribute to a better diagnosis of the processes taking place in the labour markets.

Disaggregation of employment into components can be made based on various criteria. One of the most important classification criteria is the type of employment contracts as the basis of employment. According to the classification adopted in the OECD reports, we can identify regular employment understood as employment on the basis of employment contracts of indefinite duration and non-regular employment comprising all types of employment which do not use the standard, legal protections in the field of employment protection (OECD 2014, p. 146). The main type of non-regular employment is – according to this classification – temporary employment, whose basic form is fixed-term employment (OECD 2014, p. 146).

The subject of this paper is fixed-term employment in OECD countries. The analysis is aimed not only at recognizing the scale and structure of fixed-term

employment and its determinants in OECD countries, but also at presenting controversies regarding the economic impact of this type of employment. Particular attention is paid to the controversies concerning the importance of the development of fixed-term employment for the elasticity of employment and labour market segmentation.

The analysis in this paper is based, on the one hand, on the views put forward in the literature on the importance and consequences of fixed-term employment, and on the other hand, on the empirical basis comprising statistical data on fixed-term employment in the OECD countries in the years from 1993 to 2014 and the results of the author's and others' research on the consequences of the development of fixed-term employment for the elasticity of employment and labour market segmentation.

Trends in fixed-term employment

In the last quarter century substantial transformation of the structure of employment in terms of types of employment contracts took place in the OECD countries. Although employment for an indefinite period has remained the dominant type, employment on the basis of fixed-term contracts significantly increased its share in total employment. While in 1995 the average share of fixed-term employment in total employment for the OECD countries stood at 10.5%, then in 2014 this indicator reached 11.1%, whereas the whole growth of this indicator took place in the nineties (Stats. OECD online database).

The growing share of fixed-term employment in the OECD countries was accompanied by a trend towards convergence of the share of this type of employment. While in 1995, the variation coefficient of the share of fixed-term employment in total employment in OECD countries was 0.62, in 2014 this coefficient fell to 0.47. This indicates a tendency to equalize the differences in the share of fixed-term employment in these countries during this period (see Figure 1).

Despite the trend of convergence there are still big differences in the share of fixed-term employment among OECD countries. This is clearly shown in Figure 1.

In 2014, the highest share of fixed-term employment in total employment took place in Chile (29.2%), Poland (28.4%)[1], Spain (24%), the Netherlands (21.7%) and Portugal (21.5%). On the other hand the lowest share was found in the following countries: the United States (4.2%), UK (6.4%), Japan (7.6%), and Norway (7.8%).

[1] The data for Poland do not include employment contracts under civil law since the data in Figure 1 refer to employment under labour law.

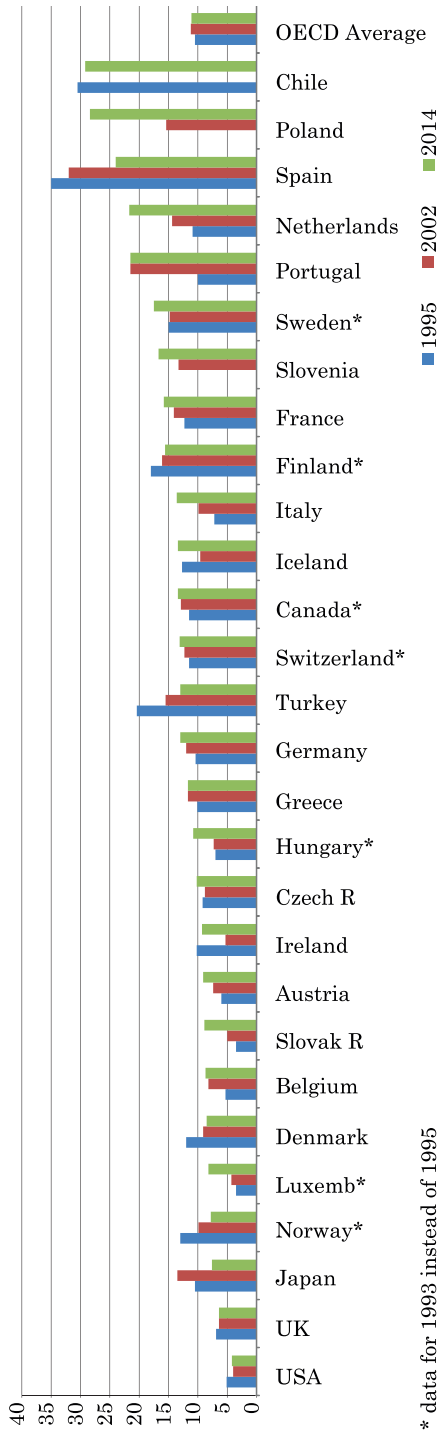

Fig. 1. Shares of FTE in total employment in the OECD countries in 1995, 2002 and 2014 (%)

Source: Stats. OECD internet database.

The question arises, what are the reasons for the growing popularity of fixed-term employment in many OECD countries in recent years? In particular, why do employers exhibit so much interest in this type of employment? One can point to several important factors and conditions.

Firstly, it should be emphasized that employers' preferences for these types of employment are associated with lower labour costs in the case of fixed-term employment than the costs of employment with a contract of indefinite duration. This is due to lower wages of workers employed on fixed-term contracts than the workers employed on contracts of indefinite duration, the weaker wage pressure exerted by the former group of employees, lower training costs of employees incurred by employers in the case of fixed-term employment, and lower termination costs of these workers (see OECD 2014a, OECD 2014).

Secondly, employers are interested in hiring workers on fixed-term contracts because it is easier to dismiss such employees in the event of the need to adjust employment to economic conditions. This is due to the relatively short periods of fixed-term employment[2], as well as very short notice periods of fixed-term contracts. This factor is very important in the era of dynamic technological and structural changes forcing fast adjustment of employment to changing economic conditions.

Thirdly, the increased popularity of fixed-term contracts was fostered by relaxed regulations on the protection of fixed-term employment which took place in many OECD countries in the nineties, coupled with relatively high restrictiveness of employment protection of contracts with indefinite duration. Declining trends in the indexes of employment protection legislation on temporary employment (EPLT) were observed in many countries. These indexes are estimated by the OECD and are a synthetic measure of this protection and depend, inter alia, on factors such as areas in which the fixed-term employment contracts can be applied, the maximum number of such consecutive contracts, the maximum cumulative duration of contracts, the minimum cooling-off periods between two fixed-term contracts so that they would not be considered as consecutive and notice periods (see OECD 2013, p. 87–93). The average EPLT index for OECD countries was 2.06 in 1995, while in 2002 it fell to 1.73, indicating a weakening employment protection for such contracts. This undoubtedly encouraged employers to conclude such employment contracts.

Statistical analyses support the hypothesis about the impact of the liberalization of employment protection legislation on the increased role of fixed-term employment. The correlation coefficient between the percentage change in the

[2] According to the OECD study, in most of these countries, contracts up to 12 month long dominate among fixed-term contracts (see OECD 2014, p. 151).

EPLT indexes and a percentage change in the fixed-term employment share for the 26 OECD countries surveyed in the years from 1995 to 2002 is -0.47, indicating that the decrease in the EPLT index was accompanied by increases in the share of fixed-term employment. Even more telling is the estimation of the parameter in a simple linear regression for the 26 OECD countries in the years from 1995 to 2002 (amounting to -0.826), which indicates that the decrease in the EPLT index by 1 percentage point entailed an increase in the share of fixed-term employment in the overall employment of about 0.8 percentage point. Figure 2 shows the graphical representation of this relationship.

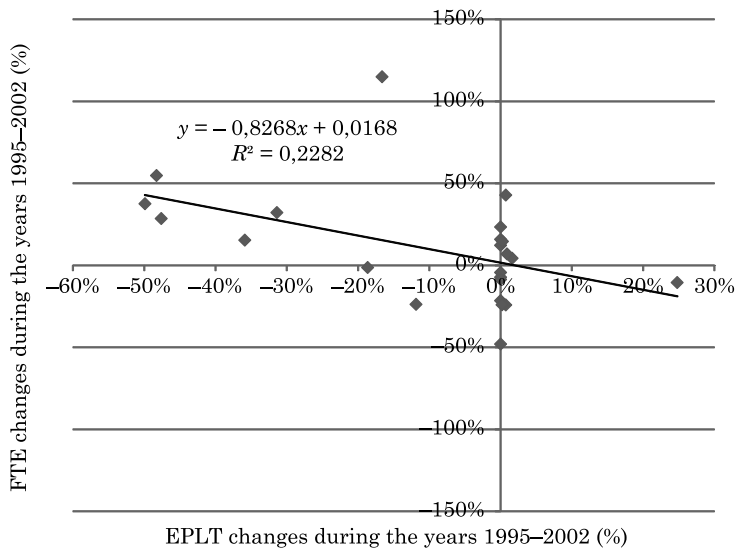

Fig. 2. The relationship between changes in FTE and changes in EPLT indexes during the years 1995–2002

Source: own calculations based on the data from Stats. OECD internet database.

Fourthly, the growing popularity of fixed-term employment is also related in part to voluntary choices made by employees. Although the OECD report shows that in most countries the majority of workers on fixed-term contracts accept this type of employment because of the lack of opportunity to find a regular employment, in such countries, however, as Iceland, Norway, Denmark, Sweden and Switzerland, a relatively high proportion of employees on fixed-term contracts (about 30–50%) voluntarily choose this type of employment (e.g., when they want to combine work with education or do not want to be involved for a long time with some employer) (OECD 2014, p. 149).

Table 1

FTE by age groups in the OECD countries in 2011–2012 (share of employees with FTCs in the total number of employees at given age, %)

Country	All	Older workers (55–64)	Prime-age workers (25–54)	Youth (15–24)
Chile	30	23	29	47
Poland	28	23	25	58
Spain	24	10	24	62
Korea	23	40	20	28
Netherlands	19	7	13	50
Portugal	21	11	20	58
Sweden	16	7	12	58
Slovenia	17	10	13	73
France	15	9	11	56
Finland	15	8	13	43
Italy	13	7	12	51
Iceland	13	7	9	33
Canada	13	10	10	31
Switzerland	13	3	6	52
Turkey	12	19	10	19
Germany	14	4	10	54
Greece	10	7	10	29
Hungary	9	8	9	23
Czech Republic	8	9	7	25
Ireland	10	7	8	34
Austria	9	2	4	37
Slovak Republic	6	5	5	19
Belgium	8	3	6	32
Denmark	8	3	7	21
Luxembourg	7	4	6	37
Norway	8	2	7	23
Japan	13	15	10	28
United Kingdom	6	5	5	14
Estonia	3	2	2	12

Source: OECD Employment Outlook 2014, p. 154.

As shown in Figure 1 the growing share of fixed-term employment have not occurred in the all analysed countries. In some countries (USA, UK, Japan) the shares have remained at low levels. It is worth noting that these countries can be characterized by relaxed regulations on the protection of regular employment (Stats. OECD internet database). One can suppose the relatively high

Table 2
FTE by level of education of people aged 25–54, 2011–2012 (share of employees with fixed term contracts in the total number of employees with a given education, %)

Country	Total	High	Medium	Low
Poland	25	16	26	43
Spain	23	21	23	28
Netherlands	14	14	13	15
Portugal	20	24	18	18
Sweden	12	13	10	17
Slovenia	13	13	13	14
France	12	11	12	14
Finland	13	13	12	11
Italy	12	16	10	13
Iceland	8	11	8	8
Canada	10	13	9	9
Switzerland	6	9	4	6
Germany	10	11	9	15
Hungary	8	5	7	22
Czech Republic	6	6	6	14
Ireland	7	8	7	9
Austria	5	10	3	4
Slovak Republic	6	3	5	40
Belgium	7	7	6	8
Denmark	7	8	5	6
Luxembourg	6	7	4	5
Norway	6	8	5	6
United Kingdom	4	5	4	4
Estonia	3	2	4	8
Greece	10	7	8	18
Lithuania	2	1	3	9

Source: OECD Employment Outlook 2014, p. 156.

flexibility of employment in these countries in based on the flexibility of regular employment.

Let us take a look at current trends in the characteristics of fixed-term workers. Relevant data from the survey of the workforce carried out in the OECD countries during the years from 2011 to 2012, are shown in Table 1 and 2.

Table 1 contains data on the percentage share of people working on temporary contracts in the total number of employees in specific categories; in addition to the indicator for the entire working population three age groups have been identified: 15–24 years, 25–54 years and 55–64 years. The most

important conclusion from the data in Table 1 is that in all the countries surveyed, young people aged 15–24 years are over-represented among those working on fixed-term contracts. This is evidenced by the fact that in all countries the share of young people working on fixed-term contracts in the total number of employed persons aged 15–24 is much higher than the corresponding rates for the entire working population. In ten of the countries surveyed, more than half of the working young people had fixed-term contracts, while in Slovenia the share was 73%. Poland also belongs to the group of countries with a dominant share of fixed-term contracts among working youth (58%). It can be concluded that the problems related to fixed-term employment primarily affect young people. Among the countries surveyed only in Korea and Turkey different patterns were observed, characterized by a relatively high share of fixed-term contracts in a group of elderly people aged 55–64.

Table 2 shows statistics on the 26 OECD countries during the years from 2011 to 2012 specifying the share of workers employed on fixed-term contracts in the total number of employees with a given level of education, while only the workers in the 25–54 year age group were taken into account. Three levels of education were identified: low, medium and high. The table shows, firstly, that in the 16 countries there was an over-representation of persons with low education in the stock of fixed-term jobs. This is evidenced by much higher percentages of workers with fixed-term contracts among employees with low level of education than the corresponding rates for the entire population. This over-representation was particularly high in Slovakia, Poland, the Czech Republic and Hungary. We must therefore conclude that the low level of education in most countries surveyed is a factor increasing the likelihood of fixed-term employment. Secondly, it should be noted that this regularity was not universal, because in ten other countries there was an over-representation of people with high education in the stock of fixed-term jobs. Especially in countries such as Austria, Switzerland, Canada, Italy and Portugal the share of workers with fixed-term contracts in the number of employees with higher education was significantly higher than the corresponding rates for the entire population. This may indicate a somewhat different range of factors that affect the development of fixed-term employment in these countries.

Do fixed-term employment contracts actually increase the employment elasticity?

In discussions on the importance of fixed-term employment an argument is often raised about the important role of this type of employment in increasing employment elasticity. The question arises, why is employment elasticity so

important and whether indeed fixed-term employment increases employment elasticity?

Employment elasticity in the economic literature is usually understood as the ability to adjust the number of workers to changing conditions and determinants, such as: production, wages, profitability or technology (EHRENBERG, SMITH 2012, p. 95), and is treated as a component of a broader concept, namely, labour market flexibility, comprising in addition wage flexibility, working time flexibility and labour supply flexibility.

The issues of labour market flexibility have been the subject of interest in economics for a long time. For neoclassical economists flexible wages and prices formed the basis of mechanisms to restore balance on the markets. Keynes, who challenged the neoclassical belief in the effective operation of flexible wages, argued that the size of employment adjusts to the size of aggregate demand and production. Friedman put forward the theory of a natural rate of unemployment, which implies the imperfect flexibility of various variables in the labour market is one of the causes of the natural unemployment rate. In a similar vein the authors of the NAIRU concept spoke about the role of labour market flexibility in the development of equilibrium unemployment (KWIATKOWSKI 2002, p. 99–154). Also the theories on adjustments to economic shocks stressed the importance of wage flexibility, working time flexibility and employment flexibility for the nature and speed of adjustment processes, and pointed to the possibility of trade off between the scale of the adjustments in the form of changes in employment and the scale of adjustments in the form of changes in wages and working time (Cahuc, Zylberberg 2004, p. 193–214, SMITH 2003, p. 47–73).

Economic theories involving labour market flexibility stressed above all, the importance of different types of flexibility for restoring equilibrium on the markets and to a lesser extent – with the exception of the theories held in the Keynesian tradition – drew attention to the negative consequences of flexibility related to fluctuations in employment and wages. The argument about the essential role of labour market flexibility in restoring equilibrium gained even more importance with the creation of the Eurozone, when one of the essential adjustment mechanisms based on changes in national currency exchange rates ceased to operate. In this situation, flexible labour markets began to be seen as an essential mechanism for the adjustment of the economy in times of economic shocks, offsetting the loss of the exchange rate mechanism.

Empirical studies on the role of fixed-term employment in the development of employment flexibility have been conducted many times in the economic literature. A. Benito and I. Hernando analysed the effects of flexible work contracts in Spain based on individual firm data and concluded that the increase in the share of fixed-term employment contributes to higher cyclical employment volatility (BENITO, HERNANDO 2008). W. van Lancker drew a simi-

lar conclusion from his analysis of European labour markets (VAN LANCKER 2012). Several studies analysed fixed-term employment in the context of employment for an indefinite period. It was noted that fixed-term employment is used especially as adjustment tool during periods of unexpected changes in economic activity, resulting in a reduction in volatility of employment for an indefinite period (GOUX, MAURIN, PAUCHET 2001; PFEIFFER 2009). The research of the labour market in Spain after the reforms of the market in 1984 shows that the development of fixed-term employment increased the demand for labour by approx. 3.5%, but also reduced employment for an indefinite period by approx. 10% (AGUIRREGABIRIA, ALLONSO-BORREGO 2014). P. BENTOLILA et al. analysed adjustment processes in the labour markets in Spain and France after the crisis of 2008 and came to the conclusion that the liberal legislation in the field of fixed-term employment in Spain was a significant reason of higher unemployment in this country than in France (BENTOLILA, CACHUC, DOLADO, LE BARBANCHON 2012). In turn, O.J. Blanchard and A. Landier examined the consequences of fixed-term employment in France, and came to the conclusion that while the development of fixed-term employment increased cyclical volatility of employment, but too high a share of fixed-term employment reduces employment for an indefinite period and increases long-term unemployment (BLANCHARD, LANDIER 2002).

An interesting idea, from the point of view of our discussion, on the flexibility of employment, was put forward by M. Malul, M. Rosenboim and S. Tal, although they refer it to the relationship between employment flexibility and the restrictive legislation on employment protection. In their view, very liberal regulations can result in high employment flexibility because it is easy to dismiss employees, while the increase in stringency of employment protection should result in a decrease in employment flexibility. The latter relationship has however probably its limits, because a very restrictive legislation on employment protection and failure to adjust employment to the economic conditions may increase the irrational allocation of the labour force, causing a decline in profitability and increased layoffs (MALUL, ROSENBOIM, TAl 2011, see also MALUL, ROSENBOIM, SHAVIT, TARBA 2011). We are actually dealing with a U-shaped relationship between employment flexibility and the restrictiveness of employment protection legislation.

This idea can be used to formulate the hypothesis of a U-shaped relationship between the share of employees on fixed-term contracts in the total number of employees and employment flexibility. This seems to be justified when we assume substantially greater liberalization of employment protection in the case of fixed-term employment contracts and the trade off between fixed-term employment and employment for an indefinite period. This hypothesis can be summarized as follows. With a high share of employees on fixed-term contracts employment flexibility can be quite high because it is easy

to lay off employees during the downturn. Reducing the share of workers on fixed-term contracts should reduce employment flexibility due to the increase in employment protection and more costly dismissals for employers (due to the increase of employment for an indefinite period). But this regularity probably has its limits. A too low share of employees on fixed-term contracts and failure to adjust the number of employees to economic conditions can result in additional costs from the irrational allocation of the labour force in enterprises, resulting in negative consequences for companies' profits and the size of their demand for labour, increasing as a result employment flexibility during the economic downturn.

This hypothesis was verified econometrically in another article (KWIATKOWSKI, WŁODARCZYK 2014), which used annual data for 28 OECD countries in the years 2002 to 2011 to estimate the impact of the share of employment for an indefinite period (note that the increase in this share means a decline in the share of employees on fixed-term contracts) on employment elasticity[3] in relation to GDP in the three sub-periods: 2002–2007, 2008–2011 and 2002–2011. The results obtained were consistent with the theoretical hypotheses formulated above and are graphically illustrated in Figure 3.

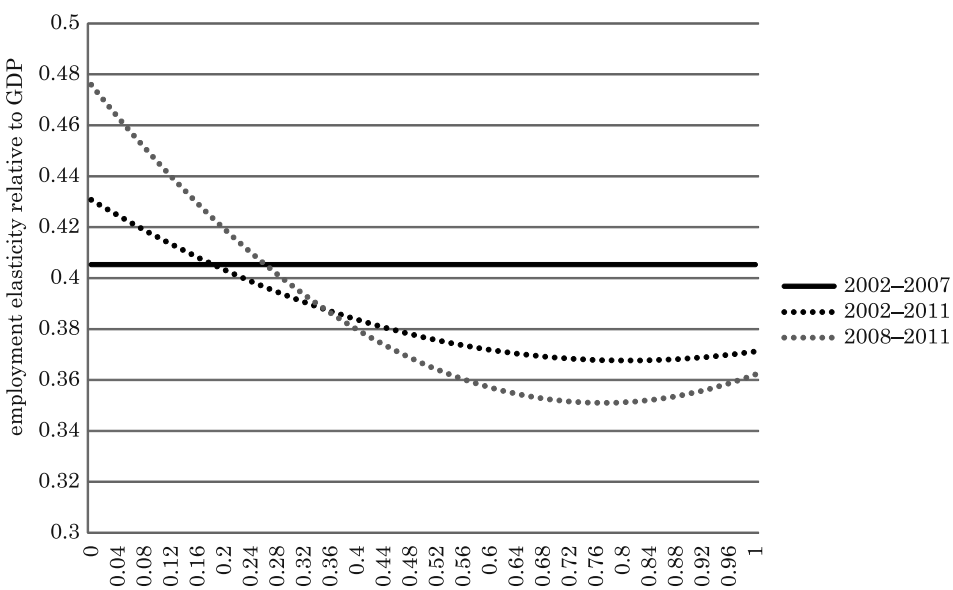

Fig. 3. Employment elasticity relative to GDP in the OECD countries at different shares of permanent employment contracts

Source: KWIATKOWSKI, WŁODARCZYK (2014).

[3] When we measure the flexibility of employment we use the term elasticity instead of flexibility.

As shown in Figure 3, higher employment elasticity can be observed in countries with relatively low and relatively high share of employment for an indefinite period in total employment (as well as with a high and low share of fixed-term employment). This means, therefore, that we can expect more declines in employment during the economic downturn in these countries. In the case of the analysed OECD countries in the years 2008 to 2011 elasticity of employment with respect to GDP takes a minimum value with the share of contracts for an indefinite period in the total employment contracts at the level of 78% (the fixed-term contracts at 22%). For the whole period from 2002 to 2011 this elasticity takes a minimum value with the share of employment for an indefinite period at the level of 81% (a share of fixed-term employment at 19%).

Does fixed-term employment lead to the labour market segmentation?

Upward trends in fixed-term employment, occurring in many countries, led to the creation of two segments of jobs which differ substantially in terms of employment protection, employment stability and the amount of wages, namely: good jobs based on contracts for an indefinite period and bad jobs based on fixed-term contracts. The question arises whether the situation, meaning the segmentation of jobs, also means the segmentation of employees? In other words, whether between these two segments of jobs there exists a flow of employees, or whether employees are assigned to these segments for longer? Is the employment on fixed-term contracts a transitory "stepping stone" into stable employment for an indefinite period, or a pitfall which holds these employees there for longer?

On the theoretical side, one should note the arguments in favour of the "stepping stone". Employees taking up fixed-term employment gain experience, increase their human capital, and also expand their network of contacts, which can help them find a permanent job. On the other hand, one should also note the arguments for a "pitfall" because while engaged in fixed-term employment, employees may not look for a permanent.

Empirical studies undertaken in different countries have produced different results. While studying the labour market in Germany, T. Hagen found that fixed-term employment after two years increases the probability of a permanent job (HAGEN 2003). Many empirical studies were devoted to the labour market in Spain. One of them stressed that taking up fixed-term employment helps to find a permanent job, but only in the case of educated people, but not young people and women (CASQUEL and CUNYAT 2008). Other

studies show that over 20% of employees on fixed-term contracts in Spain had the same job five years later (TOHARIA and CEBRIAN 2007). M. Guell and B. Petrongolo came to the conclusion that flows of workers between the two segments of jobs in Spain are small (GUELL and PETRONGOLO 2007). A similar conclusion can be drawn from the data of the European Union Statistics on Income and Living Conditions (EU-SILC), which are shown in Figure 4. They indicate that in the vast majority of EU countries, less than 50% of employees who were on fixed-term contracts in 2008 became employed for an indefinite period in 2011 (see Figure 4).

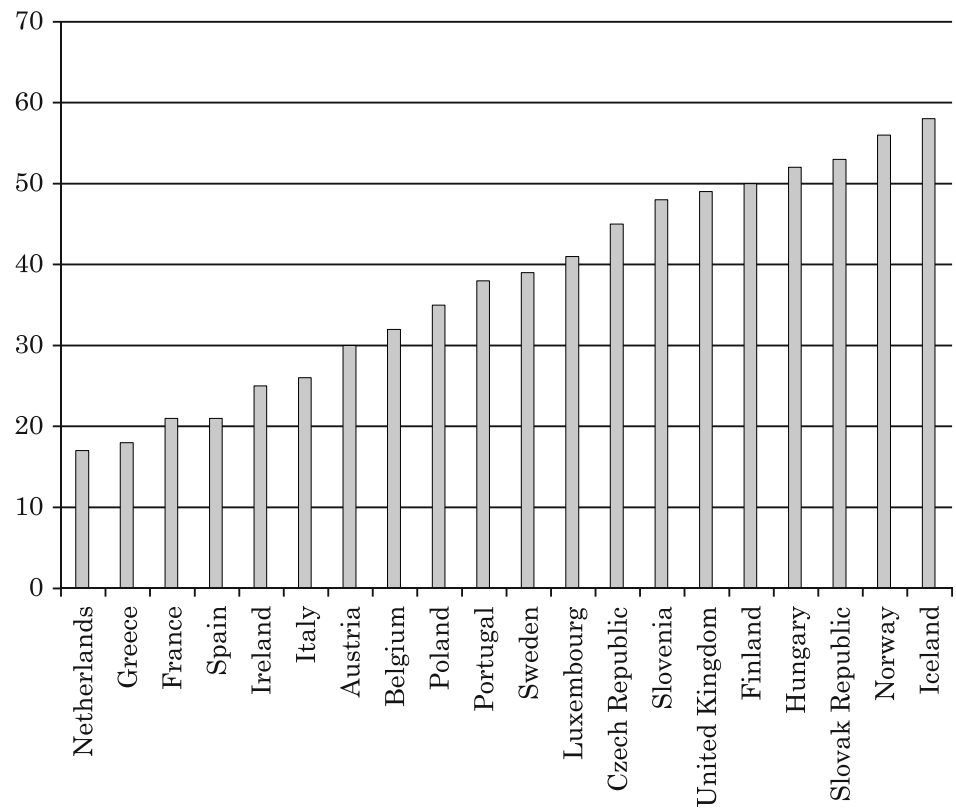

Fig. 4. Three-year transition rates from temporary to permanent contracts (percentage share of temporary employees in 2008 that were employed as full-time permanent employees in 2011)
Source: OECD Employment Outlook, 2014, p. 182.

The above-mentioned data and results of empirical studies show that flows of workers between the two above mentioned segments of jobs are relatively small. It is especially important that the outflows from the fixed-term employ-

ment segment into the segment of employment for an indefinite period are low, which perpetuates the "being" of workers in their respective segments. This demonstrates a tendency towards a contractual labour market segmentation.

Conclusions

The analysis shows that the role of fixed-term employment in many OECD countries has increased in the last quarter century. This was due to the relaxed legal protection on fixed-term employment, the ease with which this group of employees can be dismissed, as well as lower labour costs in the case of fixed-term employment.

The analysis shows that fixed-term employment affects employment elasticity, but not in a linear way, but according to the shape of the letter U: employment elasticity is high at the low and high share of fixed-term employment, and this elasticity is relatively low when the share is medium-sized (19–22%). The analysis also shows that outflows of workers from fixed-term employment into employment for an indefinite period are relatively low, and therefore it seems reasonable to claim the existence of a trend toward labour market segmentation as a result of the development of fixed-term employment contracts. Thus one can speak about contractual labour market segmentation.

In order to avoid excessive employment flexibility and eliminate a contractual labour market segmentation it is necessary to optimize the level of fixed-term employment, setting its share in the total employment at the medium level of (approx. 20%). Such action could be fostered by reducing the difference in terms of legal employment protection between fixed-term employment and employment for an indefinite period.

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UNEMPLOYMENT IN SELECTED EU COUNTRIES

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Key words: labour market, unemployment rate, unemployment dynamics, European Union Labour Force Survey

Abstract

The aim of this paper is to compare the dynamic of unemployment in the years 2000–2014 in selected EU countries. The subject of the present analysis is unemployment in total population and in subpopulations identified on the basis of gender, age, and education. The notion of unemployment rate was used throughout, and its values were taken from the Internet database Eurostat.

The analysis conducted makes it possible to draw the following conclusions. The differentiation of total unemployment rate among the selected EU countries was very high, and the shape of the curves reflected the impact of economic crisis. Around 2010 many countries saw stabilising tendencies (with the exception of Greece and the countries located in the Iberian Peninsula). In the countries with low unemployment rates the surplus of female unemployment is giving way to a gender balance, or even a slight surplus of male unemployment. Among the selected age categories, the youngest group was and continues to be most heavily affected by the situation on the labour market. A high level of education is still correlated with a lower risk of unemployment; nevertheless the growing differences between the countries constitute a troubling trend.

BEZROBOCIE W WYBRANYCH KRAJACH UE

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Słowa kluczowe: rynek pracy, stopa bezrobocia, dynamika bezrobocia, unijne badania siły roboczej

Abstrakt

Celem pracy było porównanie kształtowania się bezrobocia w latach 2000–2014 w wybranych państwach unijnych. Przedmiotem analiz było bezrobocie w populacji ogółem oraz subpopulacjach wyodrębnionych ze względu na płeć, wiek, wykształcenie. W analizach posłużono się stopą bezrobocia. Jej wartości zaczerpnięto z internetowej bazy danych Eurostatu.

Przeprowadzone analizy dają podstawy do następujących konstatacji. Poziom zróżnicowania ogólnej stopy bezrobocia wśród wyróżnionych państw UE był bardzo wysoki, w kształcie krzywych uwidocznił się wpływ kryzysu gospodarczego. Około roku 2010 w wielu państwach pojawiły się tendencje stabilizacyjne (wyjątek – Grecja państwa i Półwyspu Iberyjskiego). W krajach o niskiej stopie bezrobocia nadwyżki bezrobocia wśród kobiet ustępują miejsca sytuacji równowagi płci, a nawet niewielkiej przewagi bezrobocia po stronie mężczyzn. Spośród wyróżnionych kategorii wieku najmniej korzystna sytuacja na rynku pracy była i pozostaje nadal udziałem najmłodszych. Wysoki poziom wykształcenia wiąże się wciąż z niższym ryzykiem bezrobocia, ale stale wzrastające różnice między krajami napełniają niepokojem.

Introduction

Nowadays, the phenomenon of unemployment is commonly considered to be the main socioeconomic problem and counteracting it is one of the priority challenges for authorities at every level: from the local officials, through the state politicians to the EU decision makers. The size of unemployment is a composite result of numerous interconnected factors, among which of greatest importance are economic trends and the specific nature of the labour market. The latter is characterized not only by the proportions among the individual employment sectors, but also by the degree of its flexibility and the details of programs limiting unemployment (HAJDER 2013, p. 49).

The present article will discuss the results of analysing unemployment data in selected EU countries, which were obtained thanks to the international survey referred to as Labour Force Survey. In order to achieve that objective, we have investigated the dynamic of development of unemployment rates, a measure which helps to describe in a synthetic manner the phenomenon in the years 2000–2014[1].

The concept of obtaining information about the labour force by using surveys conducted in households is not new. In many countries questions referring to having the acquired profession were incorporated into the sets of questions attached to population censuses already in the second half of the 19th century. However, at that stage questions concerning the economic status (the working/unemployed/professionally passive person) were not yet asked. The ongoing industrialization, and the resulting change of social structure, created the need for new approaches and more refined methods of measuring labour market phenomena. The issue became particularly urgent in the thirties of the 20th century, with the advent of massive unemployment as a consequence of Great Depression (*Labour force*... 1998, p. 8). Having regularly updated information about the unemployment levels and trends became a necessity.

[1] An extended definition of the term will be provided in one of the subsequent parts of this article.

Monthly surveys of the labour force in new conceptual frames were first conducted in the United States in 1940. Europe proved to be much slower as regards this sort of research. First experimental surveys, named Labour Force Survey (LFS) and applied to countries of the European Community, were conducted in 1960, with the participation of six founding member states: Belgium, Germany, France, Italy, Luxembourg and the Netherlands. They were not repeated until 1968, when the first series of annual surveys was conducted. Due to lack of commonly approved terminology, initially researchers relied on various and very different definitions. The situation in this respect improved thanks to the resolution[2] adopted in 1982 in Geneva at the 13th International Conference of Labour Statisticians under the auspices of International Labour Organization – ILO (*Quality report*... 2014, p. 5). The guidelines included in it are the current basis for LFS research conducted in all member states of the EU.

In this study 10 out of 28 EU countries were selected and assigned to three groups. The first group encompassed countries which in 2014 had the lowest rate of unemployment: Germany, Austria and Great Britain, whereas the third group consisted of the countries in which the rate was the highest: Greece, Spain and Portugal. The group in the middle was, in accordance with the authors' intentions, supposed to consist of the countries which border with our country and which entered the Union together with Poland in 2004[3]. Eventually, Hungary replaced Lithuania, because the statistical series of the latter country frequently suffered from lack of data in less numerous categories, and the volatile run of curves may have signified a dangerously high sampling error. For the same reasons some of the analyses were limited to the sets of persons between the ages of 15 and 64.

According to Eurostat estimates in the year 2000 the number of persons aged 15–64 in the countries belonging to the European Union amounted to 319 million, while in 2014 it increased by further 10 million. From the point of view of the labour market, each of those persons could be assigned to one of three categories: employed, unemployed (understood jointly as professionally active) or professionally passive (inactive). In the course of 15 years the number of active persons increased by more than 19 million and reached the level of 238 million (employed – 213 million, unemployed – ca 25 million), while the number of those professionally passive decreased by 9 million and totalled 91 million.

[2] *Resolution concerning statistics of the economically active population, employment, unemployment and underemployment.*

[3] Due to a low rate of unemployment, the Czech Republic could have been assigned to the first group.

In most of the countries taken into account in this analysis the number of persons employed increased[4]. Greece and Portugal were exceptions since they registered half-million losses. However, at the same time the number of unemployed persons has also been on the rise. An unprecedented growth of this population took place in Spain (over 3 million), and a smaller one – in Greece, Portugal and Great Britain[5], while an even smaller increase was observed in Austria and Hungary. On the other hand, unemployment decreased by over 1,0 million in Poland and in Germany, whereas Czech Republic and Slovakia saw a decrease of only slightly more than 100 thousand. Changes also took place as regards professionally passive persons. Their number decreased considerably in Germany (4,2 million) and Spain (1,6 million), and to a lesser degree in Poland and Hungary (less than 600 thousand). On the other hand, Great Britain and Slovakia were the countries in which a slight increase in the number of professionally passive persons was registered.

Total unemployment rate

We will start the analysis proper by presenting the dynamic of total unemployment rate in a harmonised manner. The rate is a result of the standardised, Eurostat-approved[6] method of determining this index for each of the member states. The coefficient expresses the percentage of unemployed persons in the labour force, which is the total number of employed and unemployed persons[7].

In the years 2000–2014 the first of the selected groups of countries was characterized by a relatively narrow range of unemployment rates (until the moment of the outbreak of economic crisis they oscillated around 5%). The exception was Germany, which in the years 2004–2006 had an over 10% unemployment rate. After 2008 the value of this index in Germany was steadily decreasing; in Austria it did not change, while in Great Britain it increased slightly, as a result of which the difference between Germany and the remaining countries decreased and, in addition to that, Germany became the leader (5,0%).

[4] In Germany by nearly 3 million, in Great Britain by 2,7 million, in Spain by 2 million, in Poland by 1,5 million.

[5] From 0,4 to 0,7 million.

[6] The data are calculated on the basis of quarterly results of the labour force survey (LFS) and seasonally adjusted monthly data on registered unemployment.

[7] An unemployed person aged 15–74 has to meet three conditions at the same time: be without work in the reference week; be available for work before the end of the two weeks following the reference week; be actively seeking work.

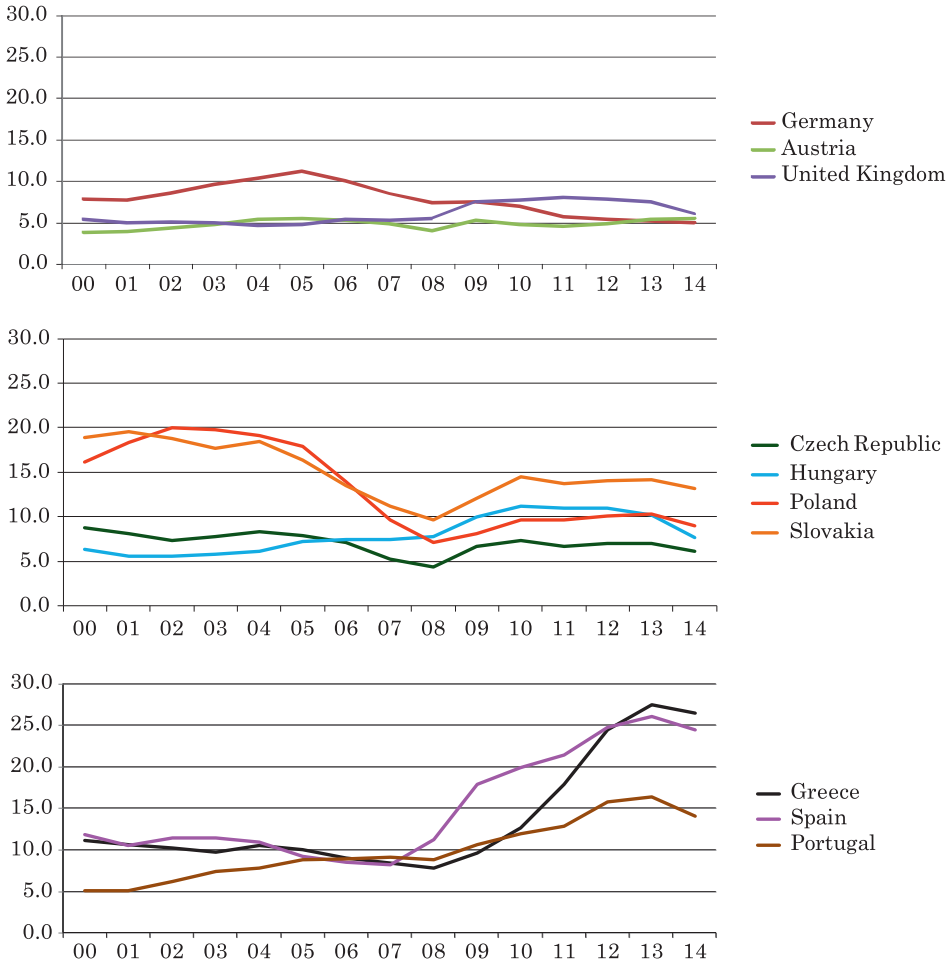

Chart 1. Total unemployment rate in selected EU countries in the years 2000–2014
Source: Author's own study on the basis of data from the Eurostat database.

In the second group of countries, which includes Poland, in the course of eight consecutive years a considerably wide range of unemployment rates could be observed. The quite good and relatively stable situation of Czech Republic and Hungary contrasted sharply with what was happening in Slovakia and Poland, where the unemployment rate was then at its record high. 2008 was a breakthrough year. During that year Poland recorded the lowest unemployment rate in its most recent history (ca 7%), followed by increase and stabilisation at the level of ca 10%. Since 2007 until the present day the highest unemployment rate has been registered in Slovakia. Similarly

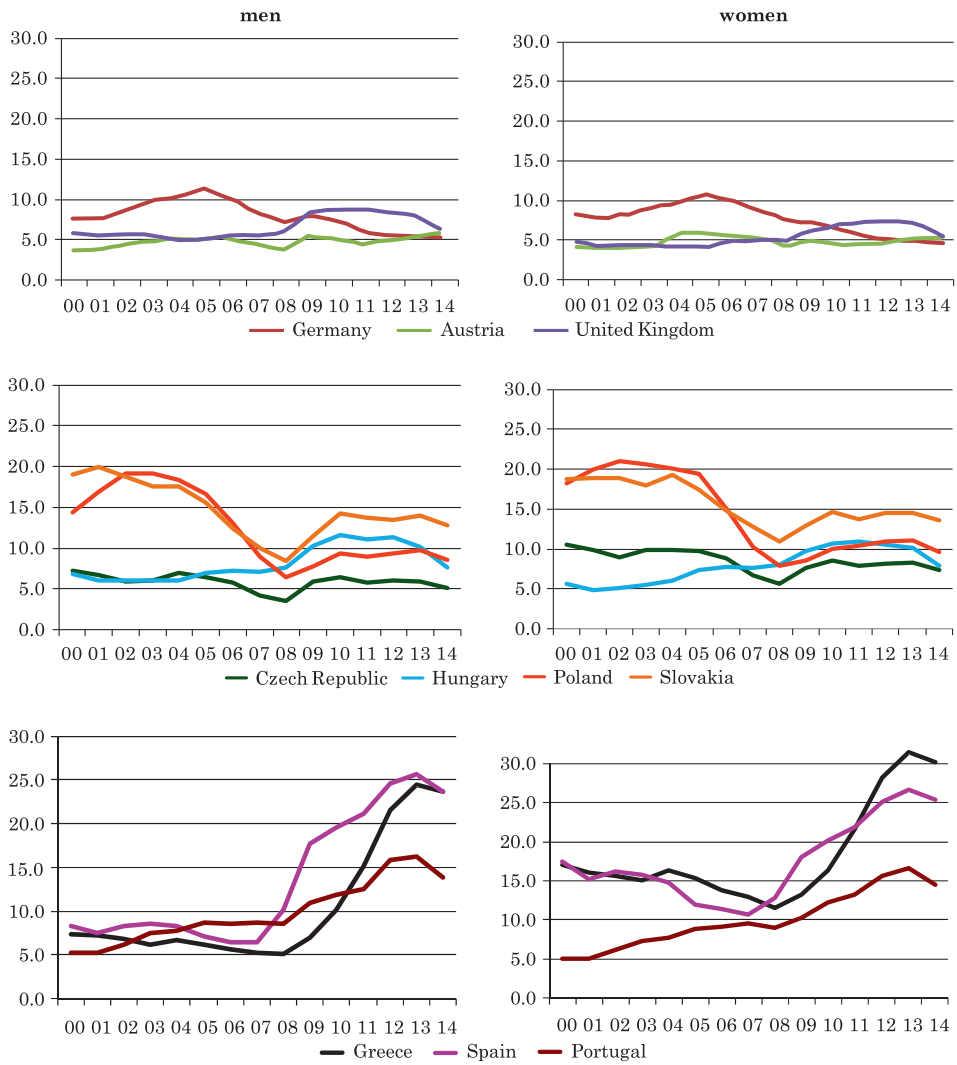

Chart 2. Unemployment rates by gender in selected EU countries in the years 2000–2014
Source: Author's own study on the basis of data from the Eurostat database.

to the countries of the first group, in 2014 the differences among the countries were significantly lower in comparison with 2000.

The third group of countries – initially characterized by relatively low unemployment rates[8] – started to experience a sharp increase of this index since 2008. The phenomenon affected Spain first and, after some time, Greece

[8] Spain – ca 12%, Greece – 11%, and Portugal – as low as 5%.

(at the height of the crisis the unemployment rate there exceeded 26%). In comparison, Portugal proved to be in a much better situation (the maximum unemployment rate there reached 16%). 2014 brought to each of the three countries a slight decrease in the total unemployment rates.

Unemployment by gender

It has long been observed that combining professional activities with taking care of one's children (mostly by women) inevitably leads to temporary absences of women, related to maternity and parental leaves, which resulted in their being less flexible. The justified social protection of women against the market mechanism that marginalizes them required each country to adopt relevant legislation and other remedies conducted under public policy, which to a large degree (though not exclusively) is responsible for the differences on the European labour markets[9]. Chart 2 below presents unemployment rates in reference to both genders.

In the first group of countries the differences between the values of unemployment rate depending on gender were relatively small. A situation nearing balance can be found in Germany (although for the majority of temporal points the unemployment rates were slightly higher for men). Until 2008 in Austria a slight surplus of female unemployment was registered; after a few years of fluctuations it gave way to an almost complete gender balance. On the other hand, in Great Britain male unemployment was higher nearly in the whole observation period. Ultimately, then, in this group of countries a balance was maintained or male unemployment rate was slightly higher. In the second group Poland, as well as Slovakia and Czech Republic, had a permanent surplus of female unemployment. However, its level in Czech Republic was unexpectedly high. In Hungary after a few years of the surplus of male unemployment, since 2004 the unemployment rate of both genders remained balanced. As regards the third group, in the years 2000–2014 an almost perfect balance existed in Portugal. Spain managed to move from the very high level of female unemployment (over two times higher than in the case of men) and in 2009 it achieved the level of Portugal. In the following years the proportions of unemployment of women and men in both countries remained at almost the same level. In Greece after the initial stage, when female unemployment was nearly two and a half times higher, since 2007 a sharp decrease of the differences was observed, although this country is still

[9] In European countries one can observe a considerable differentiation in this respect. As regards the European Union, legislation which is particularly favourable towards women can be found in Scandinavian and Benelux countries.

experiencing too much female unemployment. The reasons for this state of affairs should be ascribed not only to legislation, but also to centuries of tradition.

Unemployment by age

The stages of growing-up and school education on the one hand, and maturity and growing old on the other, are the factors differentiating individuals' situation on the labour market. In this article differences are shown using one of the most popular classification methods of categorizing unemployment rates (BALCEROWICZ-SZKUTNIK 2014, p. 139):

a) Persons aged 15–24 (assumed to be "graduates"),
b) Persons aged 25–49[10] (assumed to be professionally "mobile"),
c) Persons aged 50–64 (assumed to be at pre-retirement age).

We will begin with the youngest age group which, due to its specific nature, will be covered in greater detail. This age group comprises both persons receiving education at various levels and graduates who, for various reasons, have not yet taken up employment, and those two populations constitute the highest share of the group, which certainly influences the values of the index. Because of that fact we will include a few related remarks in the subsequent sections.

In source literature it has been observed that the relation between professionally active (especially working) persons and professionally passive persons is crucial for the assessment of the conditions of the given labour market (KRYŃSKA, KWIATKOWSKI 2013, p. 38). Between the years 2000 and 2014 among the youngest persons in all countries, with the exception of Austria, the total number of working persons decreased, although the losses differ enormously depending on the country (from ca 40 thousand in Great Britain, to over one million in Spain). In general, the number of professionally passive persons decreased as well; the greatest decrease was registered in Poland – ca 730 thousand (among the exceptions there was Great Britain – an increase by almost 800 thousand). As a result of the changes, in 2014 the structure of the youngest age group looked as follows. Only in the countries belonging to the first group the percentage of professionally active persons was slightly higher than the share of professionally passive persons, while in the countries belonging to the second and the third groups the professionally active persons constituted a minority, oscillating between 28% in Greece and 36% in Spain (in both countries the percentage of working persons turned out to be

[10] The upper limit moved by 5 years in relation to the usual limit of 44 years.

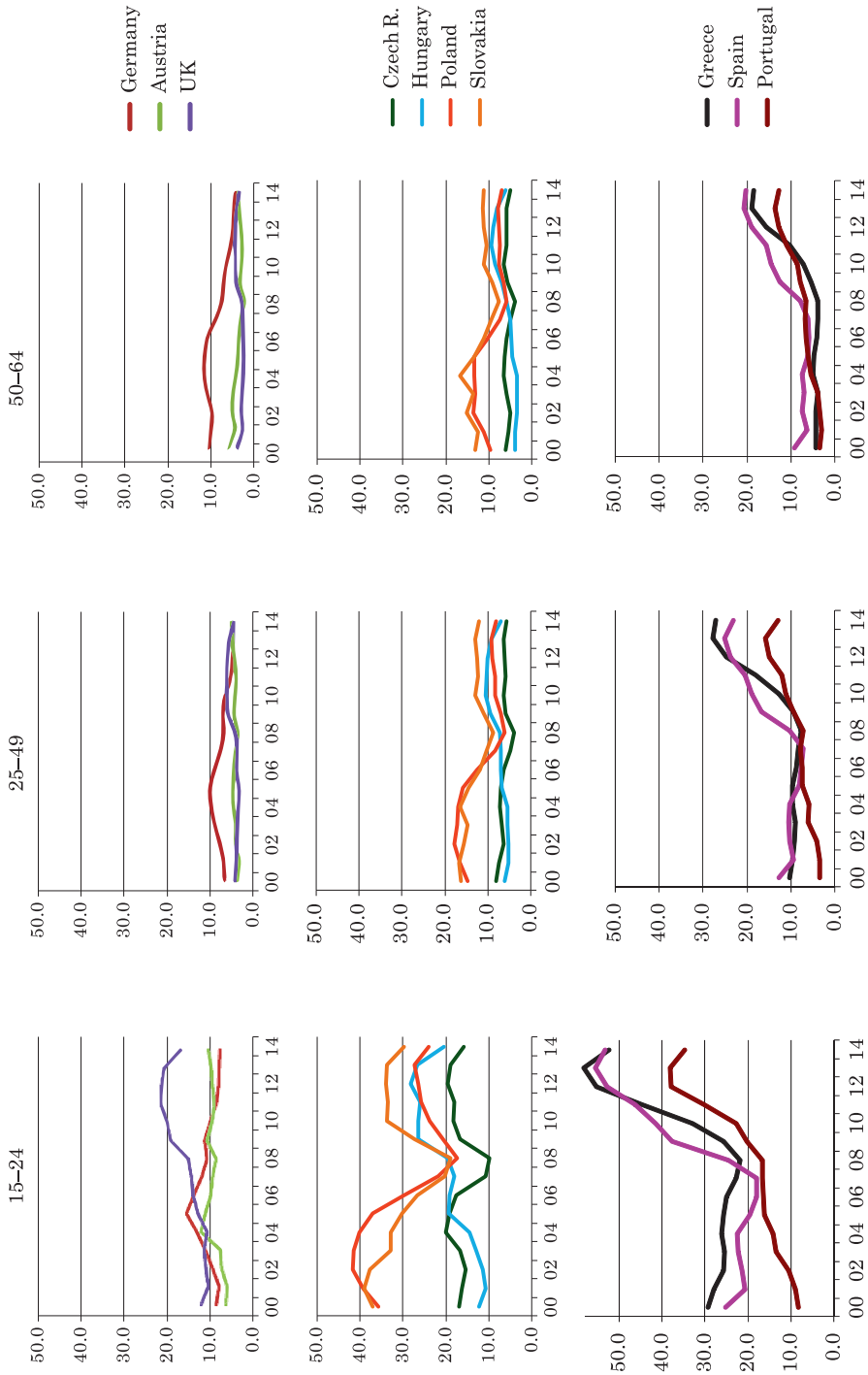

Chart 3. Unemployment rate by age in selected EU countries in the years 2000–2014

Source: Author's own study on the basis of data from the Eurostat database.

surprisingly small: 13% and 17%, respectively). Professionally passive persons were dominant, constituting more than 2/3 of the whole population in the second group and 3/4 in the third group. Another step in the analysis should be the identification of the internal structure of this subset; unfortunately, the available statistical data proved to be decisively insufficient[11]. We shall, then, return to the analysis of unemployment rates.

The above charts confirm the commonly known fact that unemployment among the youngest population is the highest. Only in Germany until 2003 the highest unemployment rates characterized the oldest persons. The exceptional situation on the German labour market is also visible as regards the continually decreasing unemployment rates among the young persons after 2006. In Austria during the whole observation period a stable trend was maintained, oscillating around 10%. In Great Britain after a relatively mild increase, 2009 brought its acceleration and then stabilisation (at a level two times higher than in Austria). In the second group of countries the situation was varied. The most difficult situation occurred in Poland and in Slovakia. In the first half of the decade in Poland the unemployment rates among youths exceeded 40%, after which a decisive decrease took place, followed by yet another increase and a small decrease in the recent years. In Slovakia (apart from the "concavity" characteristic for the majority of countries in the pre-crisis period) the unemployment rates never decreased below 30%. In the same period the best conditions existed in Hungary, and after 2006 – in Czech Republic. The highest unemployment rate – in this age category – was registered in the countries belonging to the third group. Although Greece started with a lower level than Poland, nevertheless its rate was very high for an EU country in those times (29%). In the same period the value of this index in Spain was slightly lower. Around the year 2007 both countries saw a slight decrease, but after two years their unemployment rates skyrocketed in an almost vertical manner, crossing the threshold of 50%. Until 2007 the situation of Portugal was decidedly better; however, afterwards, after a relatively mild increase the rate of unemployment grew in an accelerated manner (to 38%), as a result of which Portugal was placed in the ranking of 28 EU countries at the third position from the bottom (after Greece and Spain).

As was expected, the situation observed in the most numerous, middle, so-called professionally mobile age category reflected the picture obtained for

[11] The data available in the Eurostat database made it possible to establish that in 2014 in the whole EU every tenth professionally passive person aged 15–24 belonged to the NEET set (Not in Education, Employment, or Training); the maximum value of 20% was registered in Bulgaria, and the 4% minimum – in Luxembourg. As far as the selected countries are concerned, a considerable differentiation could also be seen: from the 15% maximum in Great Britain to the 6% minimum in Czech Republic, Slovakia and Portugal. The percentages quoted above were calculated for the persons who answered the question concerning their educational status.

the whole population. Let us, then, reiterate its main parameters. Until 2008 in Austria and Great Britain unemployment rates were low and after a small increase they stabilised at the level of ca 5%. In the post-crisis years Germany achieved an equally low rate. In the second group before the crisis comparatively comparably low rates (ca 6–7% in average) were registered in Czech Republic and Hungary, whereas Poland and Slovakia saw the highest rates (over 16%). In the years 2006–2007 this index decreased in both countries, with the permanent 4 percentage point difference for Poland. In the post-crisis phase the difference between the relevant countries' unemployment rates was visibly smaller. In the years 2000–2008 the situation of Greece and Spain was stable (9–10%)[12], but soon after, first in Spain, and then in Greece, the unemployment rates quickly started to increase (25–27%). In Portugal the value of this index grew systematically, although slowly (from 3% to over 15%). In the last year unemployment decreased in each of the three countries.

As regards the persons in the pre-retirement age (aged 50–64), we have been witnessing a spectacular, more than a threefold decrease of unemployment rate in Germany (to 5%). In the remaining countries of that group, the unemployment curves constituted a compact cluster (the most advantageous situation was registered in Austria – less than 5%). In Czech Republic the situation was stable practically in the whole observation period (ca 5,5%), while in Hungary, which initially was similar to Czech Republic, an increase was observed and, as a result, the highest value in the group was registered (almost 10%). In Poland and Slovakia the unemployment of older persons in the years 2002–2007 decreased by over a half[13], and afterwards a small increase was registered. In the third group of countries the highest unemployment rate (20%) was registered, almost uninterruptedly, in Spain. In the last two years the values of unemployment rates in Greece – in comparison to the years 2007–2008 – grew almost fivefold and became almost equal to those in Spain. Compared with this trend, Portugal, again, performed relatively well.

Unemployment by education

The correlation between the level of education and remaining jobless for persons at the age of professional activity is commonly acknowledged these days. A high level usually accompanies a better situation on the labour market, a low level – a worse one (ORGANIŚCIAK-KRZYKOWSKA 2013, p. 34–35). In our study a division into three categories was applied: primary, secondary, and

[12] A slightly decreasing tendency was even identified.
[13] From 14% to 6% and from 17% to 8%, respectively.

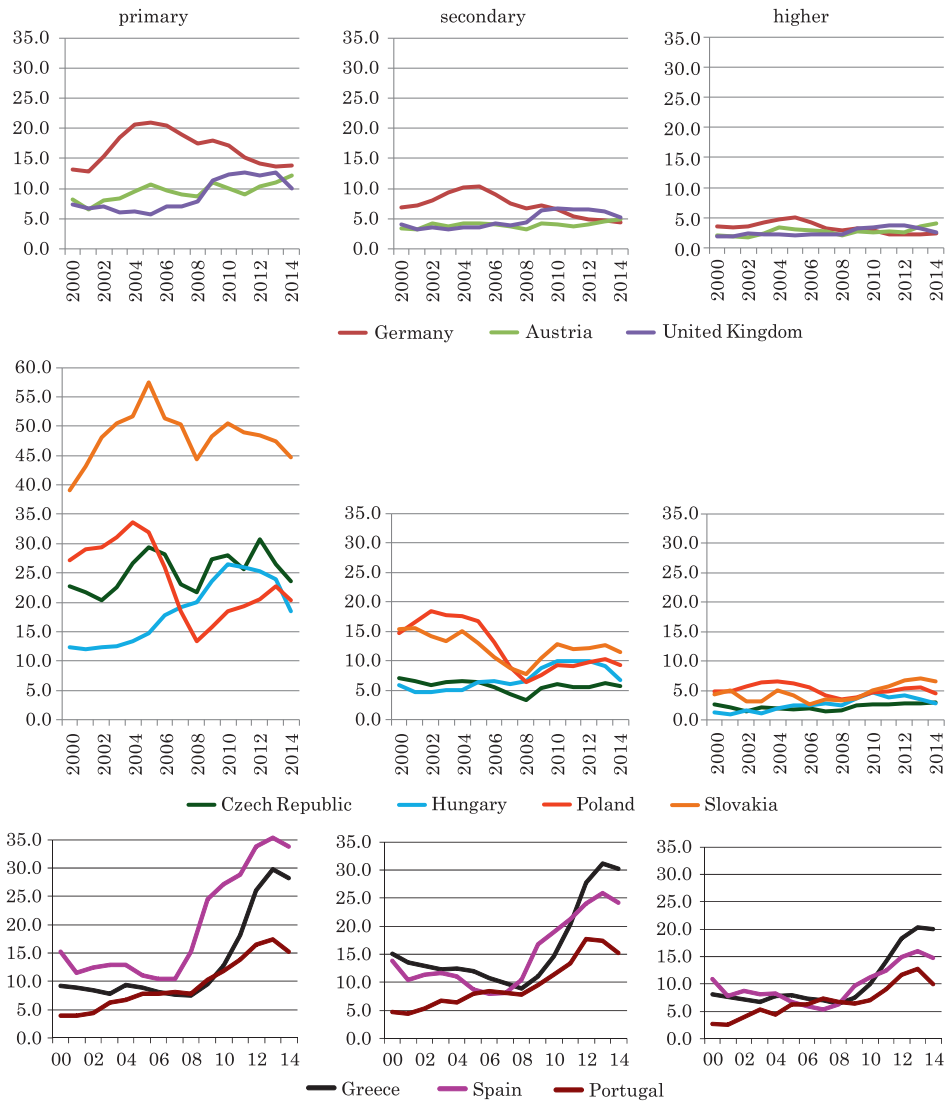

Chart 4. Unemployment rate by education
Source: Author's own study on the basis of data from the Eurostat database.

higher[14]. We have decided to analyse the professionally mobile population, which, from the point of view of legislation, is the most homogeneous and, at the same time, the most numerous population.

[14] In accordance with the recommendations of the International Standard Classification of Education (ISCED), they comprise the following levels: 0–2, 3–4, 5–8.

Among the countries assigned to the first group, in almost the whole observation period the highest unemployment of persons with primary education was registered in Germany (periodically – over 20%). After a short-term stabilization the unemployment rate in this country continually decreased, while it was continually on the rise in Great Britain and Austria, thanks to which in 2014 the situation of Germany did not significantly deviate in this respect from the remaining countries (the range of 10–12%). In the second group, Poland registered a high value and considerable fluctuations of this index: the initial increase (from 27% to nearly 34%), then sudden decrease (to 13%), and then yet another increase. Similar temporary fluctuations were observed in Czech Republic[15] and in Slovakia (an increase to a record-breaking 57% level, slight decrease, and stabilisation below 50%). Hungary experienced a systematic growth of unemployment rates until 2011 and, after a short-term stabilisation – their decrease. In the third group of countries, the least advantageous situation for the persons with primary education existed in Spain (starting from ca 15% level, after 2008 this country went through sudden increase – up to 35%). The unemployment rates in Greece evolved in a similar way – though at a slightly lower level. As far as Portugal is concerned, the increase was not taking place at such a fast pace, but it went on uninterruptedly and, as a result, the unemployment rate increased by four times (to 17%).

In the first group of countries, the fluctuations of unemployment rates for persons with upper secondary education were small. In Austria and Great Britain they ranged between 3% and 6%, while in Germany an increase was followed by a long-term decrease, as a result of which in 2014 this country had one of the lowest rates in the entire EU (4,6%). In the second group of countries, initially Poland distinguished itself in a negative manner[16]. However, in 2008 Poland was slightly "surpassed" by Slovakia (by 2 percent points). In Hungary and Czech Republic the curves reflecting the values of unemployment rates initially had very similar shapes, but later on they were no longer close to each other, and in 2014 they returned to their original positions (5–7%). Just like in the previous cases, here, too, the highest unemployment rates were registered in Spain and Greece. Although they decreased by almost half in the middle of the decade, by its end they started to grow exponentially. The year 2013 turned out to be the worst in these countries' recent history as regards their labour markets. The unemployment rates skyrocketed to as high as 25% in Spain and 30% in Greece. Until 2010 the situation in Portugal was very similar to the ones in Czech Republic and

[15] Increases alternating with decreases, with the value of the measuring index never falling lower than 20%.

[16] The unemployment rate decreased from ca 17% in 2008 to 6%, and after yet another increase it stabilised at the level of ca 10%.

Hungary, however, in the following years it got significantly worse. Nevertheless, the last year of the observation period showed a slight improvement for this country.

The relatively high unemployment rate for persons with the highest level of education (BALCEROWICZ-SZKUTNIK 2014, p. 141) shows the deficiency of the labour market and/or its inability to match the needs of the educational system. Also in this case the countries assigned to the first group had the best situation. In the course of fifteen years the value of this index in Great Britain and Austria never exceeded 4%. Since 2011 Germany enjoyed the same stable trend. In the second group – through the whole observation period – Czech Republic was close to the leaders, while Hungary registered a slightly wider range of fluctuations. In Poland and in Slovakia unemployment rates in the first and the last five-year periods fluctuated between 5 and 6%. Until 2008 Greece and Spain had rather low and relatively stable values of unemployment rates for persons with higher education, and in 2008 Portugal, as a result of systematic growth, was able to reach the level of the above mentioned countries (at 6%). Since that moment each of the countries followed its own path (while the situation in Portugal worsened only slightly, Spain and Greece saw considerable deterioration). Although in the last year unemployment started to decrease, nevertheless this new trend did not change the position of those countries and they continued to rank low among the 28 EU countries.

Summary

During almost the whole observation period, in the first group countries (with the exception of Germany) low values of total unemployment rate were registered and they were not widely differentiated. The countries comprising the second group were more disparate in this respect. They had a higher level of unemployment and their performance could be clearly divided into two subperiods: the first one – until the year 2008, and the second one, after that turning point. In the first period the differentiation of the values of unemployment rates was high, while in the second period it decreased considerably. In the last of the three identified groups the division into two subperiods was even more obvious. However, in the case of this group the first stage was generally characterized by a low level of unemployment, whereas in the second subperiod it more or less "exploded".

In the whole observation period in the majority of the selected countries women were generally more affected by the situation on the labour market. Among the exceptions, there were all three countries from the first group and one from the second group (Hungary). The shapes and runs of the curves related to both genders were very similar, with different levels.

The values of unemployment rates in individual age categories indicated the highest concentration of unemployment in the younger populations, and the lowest – in the oldest populations. Through the whole observation period a minimal value of the unemployment rate among youths was registered in Austria (ca 10%), and after the year 2008 also in Germany, whereas the highest values, especially in the recent years, occurred in Greece and Spain (over 50%).

The analyses conducted confirmed the existence of negative relation between education and unemployment. Unemployed persons with primary education are more vulnerable to the risk of staying unemployed. Slovakia set a record in this respect, since its unemployment rate exceeded 45% (at times it was even higher than 55%). Higher education generally minimized the risk of unemployment, but the difference of values of unemployment rates between Greece (20%) and Germany (slightly above 2%) suggests a limited protective effect ascribed to the completion of higher education.

Conclusion

The study presented above is treated as one of many contributions to the research on the phenomenon of unemployment. Basing these remarks on the comparison of unemployment rates in selected countries (while using a measure which is, after all, considered to be a synthetic indicator of the phenomenon), does not justify offering far-reaching generalizations. In the article we have not discussed the limitations of the applied measure, because its detailed analysis would exceed the space allotted to this article. Nevertheless we hope that the above gathered data, which confirm a number of already available findings and highlight those which have been promoted less frequently, will encourage more people to become interested in improving comparative methods and enrich the discussions on the subject.

The economic crisis seems to affect the situation of labour market in the whole EU in a similar manner, but the distinction of separate indicators of unemployment – in particular sex, but also age and education – makes it impossible to talk about one single labour market. The most important areas of research that need to be carried out in a more detailed manner are undoubtedly the convergence processes of labour markets in the EU countries. Our analysis can serve as an inspiration for research regarding situation of women on the labour market, which, according to unemployment rates, is not always worse than that of men.

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THE SERVICE SECTOR IN POLAND AS THE AFFECTING FACTOR TO THE GROWTH IN THE ECONOMY

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K e y w o r d s: services, third sector of the economy, economic growth, gross value added.

A b s t r a c t

The aim of the article was to determine service sector's influence on the economic growth in Poland. The article describes various factors influencing the development of the third sector and its influence on economic processes. The consumer behaviours of clients – their expectations in relation to the service market, have been presented. The characterization was carried out based on secondary data and studies carried out by the authors. Based on the carried out research, it can be stated that 75% of service providers indicate difficulties when setting up a service-oriented business. The existing service-oriented entities are of sufficient demand as confirmed by the 37% of service providers, which translates to direct satisfaction from the work of 62% of businesses. Characterized by the highest demand are medical, hairdressing and cosmetic services. It was also proven that the positive influence of services on the general condition of the economy has a direct effect on the increase in average employment over a long period of time. Customers decide to employ the services of the private sector more frequently as they believe the quality of the services provided by the public sector to be lower. On the whole, they rate the quality of services in Poland as average. Among the analysed groups of respondents 60% believe that Poland's accession to the EU had a significant influence on the quality, variety and availability of services.

SEKTOR USŁUG W POLSCE JAKO CZYNNIK WPŁYWAJĄCY NA WZROST GOSPODARCZY

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S ł o w a k l u c z o w e: usługi, trzeci sektor gospodarki, wzrost gospodarczy, wartość dodana brutto.

Abstrakt

Celem opracowania jest określenie cech charakteryzujących funkcjonowanie sektora usług w Polsce. W artykule omówiono zróżnicowane czynniki wpływające na rozwój trzeciego sektora i jego wpływu na procesy gospodarcze. Przedstawione zostały zachowania konsumenckie klientów, ich oczekiwania w stosunku do rynku usług. Charakterystyki dokonano w oparciu dane wtórne i przeprowadzone przez autorów badania. Na podstawie przeprowadzonych badań można stwierdzić, że 75% usługodawców wskazuje na trudności przy zakładaniu działalności usługowej. Istniejące na rynku podmioty usługowe cieszą się wystarczającym zapotrzebowaniem, o którym świadczy 37% usługodawców, co przekłada się na bezpośrednią satysfakcję z pracy 62% przedsiębiorców. Najwyższy popyt cechuje usługi medyczne, fryzjerskie i kosmetyczne. Udowodniono również, że pozytywne oddziaływanie usług na ogólną kondycję gospodarki przekłada się pośrednio na wzrost przeciętnego zatrudnienia w długim okresie. Usługobiorcy częściej decydują się na korzystanie z prywatnego sektora usług, gdyż uważają, że jakość świadczenia usług przez podmioty publiczne jest niższa. Ogólnie jakość usług w Polsce oceniają na przeciętną. Przebadane grupy respondentów w 60% twierdzą, że wejście Polski do UE znacząco wpłynęło na jakość, różnorodność i dostępność usług.

Introduction

The service sector covers all entities functioning in the economy, including individual clients, households, businesses, economic organizations and institutions. These entities expect the fulfilment of expressed needs by the consumption of services and acquirement of given benefits. The immateriality and elusiveness of services are, in matter of fact, factors determining the consumer's satisfaction. The demand for services is shaped by demographic, behavioural, economic, technological and even infrastructural factors.

The consumer can own a product, but has only access to service goods. The aspect of services in the market approach is indicative of remuneration for their use. Such remuneration is the basic criteria of economic choice made by the consumer. This results in service providers having to seek means which make it possible for them to the client's approval of the utility of their services. The monitoring of the evolution of clients and their preferences, as well as their market behaviours and buying potential is important to them. Considering that services are provided by people, people also become a part of the offer in the client's understanding. Service providers also seek solutions aimed at partially materializing services, which is to make them more similar to products and, by doing so, increase demand for them.

Arguments supporting the important role of services in the modern world on the national economy are tendencies where, along with an increase in employment in the service sector, the society becomes more affluent and the standard of living of this economy's citizens also changes progressively. The range and quality of services increases proportionally to economic growth, among others, by factors such as the increase in the number of those employed in education, public administration, healthcare and the public service sector.

Moreover, innovations in technology and production play a role in creating new types of services and stimulate the growth of those already present. It is a fact that a high share of the service sector in the national economy is an indicator of the wealth of a given nation (KŁOSIŃSKI 2011).

Keeping in mind service activities and the behaviours of those purchasing the services, it is worth assuming studies on the phenomenon of the constant increase of the service sector and its significance to society. The aim of the work is to determine the influence of the effect of services on economic growth in Poland.

Impact of service sector on employment and GDP

Since 1989, when privatization process in Poland started, the evolution in employment has been observed. It resulted mainly from the necessity of restructuring outmoded economy and became even more intensive after UE accession in 2004, as accession required many adjustments to the new economic circumstances. The country gradually adapted to new conditions resulting from economic integration. One of the stages was the significant loss of workplaces in the first and second sectors. This process occurred simultaneously with creating new workplaces in groups situated in the middle of the employment structures. Significantly slower, up to now, Poland has been moving in the direction of knowledge-intensive services the result of which is a lower level of creating well-paying jobs in the future.

Over the past twenty years, Poland has been following in the tracks of Western Europe's economy, decreasing the share of farming contributing to GDP while increasing the share of the service sector and introducing changes in the contribution of industry. Currently, over 65% of GDP is created thanks to services. Despite changes in the composition of the individual sectors, Poland still lags behind Western Europe. This is confirmed by the employment structure in the main sectors of the economy.

Where the well-being of the entire economy is concerned, as well as maintaining social stability, the role of services is very significant to creating new workplaces. Forecasts indicate positive changes to the country, where employment in agriculture is to reach the level of 5% in 2025 and employment in services will have increased to 70% just prior to 2030 (ŚWIĘCICKI 2014).

Productivity is a significant component of economic growth. The increase in capital and employment has a smaller influence on GDP. The highest increase in productivity over the past years has been observed in the service sector. This is surely due to the high efficiency of the technology used in the country. Opportunities for taking on high expenditures for investments in

Poland are being created, which bring higher returns and an increase of workplaces characterized by high productivity (*Źródła i perspektywy wzrostu* 2006).

In 2008, nearly 8 million people were employed in services. This is an increase in the number of those working in the third sector by approx. 24.9% as compared to 1995. At the same time, the number of people working in the manufacturing sector decreased by 6.8% to 6.1 million. The share of the service sector in the number of those employed increased from 49.4% in 1995 to 56.6% in 2008. The above has been shown in Table 1.

Table 1

Employees in the service sector as at the end of the year

Section	Employees in 1000s				Percentage of a number of the employees in the service sector in %			
	1995	2000	2008	2013	1995	2000	2008	2013
Trade and repairs	1903.1	2074.6	2268.8	2131.5	29.9	28.7	28.5	27.0
Hotels and restaurants	185.9	225.7	275.9	249.7	2.9	3.1	3.5	3.2
Transport, warehouse management and communications	838.1	779.3	809.1	736.0	13.2	10.8	10.2	9.3
Financial intermediation	268.2	298.6	346.1	357.5	4.2	4.1	4.4	4.5
Real estate and company services	554.3	822.6	1132.6	1432.5	8.7	11.4	14.2	18.2
Othercommunity, social and individual service activities	335.1	390.9	413.8	438.2	5.3	5.4	5.2	5.6
Total market services sector	4084.7	4591.7	5246.3	4111.1	64.2	63.6	66.0	67.8
Public administration, nationaldefence, obligatorysocial and healthinsurance	381.3	822.2	919.4	633.9	6.0	11.4	11.6	8.0
Education	896.4	902.8	1038.5	1099.1	14.1	12.5	13.1	14.0
Healthcare and socialassistance	1003.4	908.2	747.6	804.3	15.8	12.6	9.4	10.2
Total non-market services sector	2281.1	2633.2	2705.5	2537.3	35.8	36.4	34.0	32.2
Total services sector	6365.8	7224.9	7951.8	7872.6	100.0	100.0	100.0	100.0
Total production sector	6526.1	6132.9	6085.4	3665.1	x	x	x	x
Total economy	12891.9	13357.8	13816.4	13919.1	x	x	x	x

Source: own elaboration on the basis of *Ewolucja sektora usług w Polsce w latach 1995–2008*. 2010. Ministerstwo Gospodarki, Departament Analiz i Prognoz.

In the period 1995–2008, the highest increase in employment is noticeable in public administration, national defence and mandatory social security and health insurances; a good tendency in the number of those employed is also maintained by services provided for businesses and real estate. The highest decreases in the number of permanent posts can be noticed in the transport, warehouse management and communications sections (decrease of 3%), as well as in health and social protection – 6.4% decrease (*Ewolucja sektora usług w Polsce* 2010).

The year 2013 ought to be looked into as a derivative of the economic crisis experienced by Poland in the years 2009–2012. Significant decreases in employment can be observed in the individual branches of the service sector. This, however, is a temporary situation which, along with the national economy "bouncing back" from the crisis situation, will return to the norm and the proper upward trend of employment in the entire third sector. The increase of those employed in the section of financial intermediation, real estate services, education, municipal activities and health protection is a positive aspect. These branches are growing as a result of the observed market trends. This causes the total calculated share of the sector in contributing to the income of the economy increases.

Taking into account the growth dynamics of those employed in the entire Polish economy, it can be described as constant and stable. The growth dynamics in the years 1995–2000 is 103.6%, which is a 3.6% increase in the total number of those employed in the economy over a period of five years. The analogical dynamics for 2000–2008 is 103.4%, and for 2008–2013 – 100.7%. This small decrease is the effect of the mentioned economic crisis.

To look further into the service sector, the total amount of gross personnel remuneration was analysed. Remuneration paid to employees in the service sector, resulting from the work services rendered thereby on the basis of their employment contracts was used for the calculations in Table 2. Additionally, payments from profit participation or balance surplus in cooperatives as well as additional annual salaries of the employees from the budget zone were added up to an average number of the employees in a given period. Persons working abroad or engaged in outwork were excluded from the calculations.

From the data presented in Table 2 it can be concluded that the average monthly gross remuneration in the service sector indicates an appropriate and satisfactory growth trend. The growth dynamics of remuneration is positive and each year, the salaries received by the employees from the service sector are higher. Therefore, it is even more satisfying to see that this situation affects all branches of the third sector. As a result of higher incomes, the income allocated to consumption and investment expenditure of households is increasing, hence the dynamics of the Polish GDP are higher.

Table 2

Average monthly gross remuneration in the national economy in PLN

PKD section	2010	2011	Dynamics in %	2012	2013	Dynamics in %
Total	3224.13	3403.51	105.5	3530.47	3659.40	103.6
G	2633.98	2774.34	105.3	2905.25	3003.68	103.4
H	2952.46	3063.56	103.8	3166.17	3258.50	102.9
I	2023.10	2104.25	104.0	2177.02	2271.27	104.3
J	5538.06	5852.75	105.7	5900.26	6165.88	104.5
K	5390.38	5818.85	107.9	5989.61	6158.77	102.8
L	3382.59	3523.88	104.2	3719.01	3831.30	103.0
M	4054.72	4209.06	103.8	4361.27	4451.83	102.0
N	2124.65	2311.27	108.8	2462.33	2548.81	103.5
O	4149.92	4320.14	104.1	4392.24	4521.46	102.9
P	3381.09	3576.64	105.8	3750.45	3908.97	104.2
Q	3137.43	3226.07	102.8	3300.56	3374.64	102.2
R	2933.78	3031.30	103.3	3121.20	3253.94	104.2
S	2351.03	2416.82	102.8	2541.20	2876.16	113.2

Source: own elaboration on the basis of *Przeciętne miesięczne wynagrodzenie brutto w gospodarce narodowej*. 2010, 2011, 2012, 2013. SWAiD.

Gross value added increase in services

Changes to the GDP and gross value added in time take place in compliance with the principle of the business cycle. During periods of surge and slump in economic growth, both the GDP and the total gross value added change steadily, but the two components of the gross value added react differently in these two periods. In the period of improved economic growth, the value added quickly increases in this sector, but the increase of the gross value added in the service sector is substantially slower. During the periods of economic slowdown, the increase in the production sector decreases drastically, whereas in the service sector – decreases moderately.

The market services are characterised by more impact on the structure of the gross value added created in the economy. By 2008, the non-market services sector had been three times smaller than the market services sector, which in 1995–2002 had increased its share in the total value added from 42.5% to 51.4%. Therefore, the share of the market services in the entire service sector increased from 74.5% in 1995 to 77.5% in 2008, when considering the value added. The highest increase of share in the creation of the value added belongs to the financial intermediation and the real estate and company

services. The trade and repairs as well as health care and social assistance segments experienced a decrease of share. In total, both these segments experienced a 10.2% decrease (from 44.2% to 34%). Table 3 presents the ownership structure of the created value added in the service sector.

Table 3

Ownership structure of the created value added in the service sector (in %)

Specification	2000		2008	
	private sector	public sector	private sector	public sector
Trade and repairs	1.6	28.4	0.6	99.4
Transport and warehouse management	52.0	48.0	23.2	76.8
Financial intermediation	26.0	74.0	12.9	87.1
Real estate and company services	11.6	88.4	7.7	92.3
Othercommunity, social and individual service activities	30.9	69.1	30.6	69.5
Households with employees	0.0	100.0	0.0	100.0
Total	15.6	84.4	9.6	90.4
Public administration and nationaldefence, obligatorysocial and healthinsurance	100.0	6.6	100.0	0.0
Education	92.4	7.6	90.9	9.1
Healthcare and socialassistance	82.0	18.0	65.6	34.3
Total non-market services	93.3	6.7	88.1	11.9
Total services sector	32.5	67.5	27.3	72.7

Source: own elaboration on the basis of *Trzeci sektor w Polsce*. 2012. GUS, Warszawa.

The ongoing economy transformation process affected the division of share in the value added structure presented in Table 3. In 2000, the share of the non-privatised service sector was 67.5% and in 2008 – 72.7%. The highest increase of services value in the private sector in 2008 were achieved by: transport and storage, communal and social activity, and other individual activity. Public sector affects more dynamic increase of prices in the services than private sector, what causes higher inflows to the state budget from the value added tax.

Table 4 presents the gross value added in value terms according to institutional sectors.

The gross value added described in value terms is in the form of the total amount of all branches of the institutional sectors and business activities. The service sector of every year compared in Table 4 constitutes slightly above 65% of the entire gross value added created by the economy. Unlike any other sector, it has great impact on the economic, financial and political situation of

Table 4

Gross value added in value terms according to institutional sector

Specification	2010	2011	2012
	in PLN million		
Agricultural sector	36,938	43,623	44,568
Industrial sector	423,290	467,685	487,102
Service sector	805,676	853,305	900,199
Section G	246,786	255,089	275,146
H	66,356	71,093	80,742
I	15,295	16,986	17,986
J	44,508	47,917	52,252
K	52,551	59,458	57,609
L	67,686	71,644	69,110
M	66,116	69,739	71,397
N	22,082	25,590	29,460
O	77,514	78,512	82,360
P	64,997	69,102	70,722
Q	52,303	56,092	58,703
R	8,739	9,218	9,563
S	18,823	20,655	22,584
T	1,920	2,210	2,565
Total economy	1,265,904	1,364,613	1,431,869

Source: own elaboration on the basis of *Rachunki narodowe niefinansowe roczne*. 2012, SWAiD.

the whole country. For the purpose of comparison, the industrial sector constitutes merely 34% of the gross value added created in the entire economy in 2012, whereas the agricultural sector – just 4%. Services are an undeniable factor affecting economic growth. Their amount determines the development of society as well as the welfare and quality of life of the citizens in a given country.

What is of great importance for trade and service management are direct foreign investments, which were less concentrated on the industrial sector within the last few years, whereas service investments, i.e. outsourcingof business processes, shared service or R&D centres, became more significant. They constituted over 30% of the projects completed in 2011. So far, they have generated the largest number of jobs. According to the – *Association of Business Services Leaders in Poland* report: „Poland is an unquestionable leader as regards the number of employment centres and the employment rate in the modern business services sector in Central and Eastern Europe [...]" (CIEŚLIK 2010).

In the coming years, Poland will have increased opportunities for increasing the rate of inflow of foreign investments as well as export of knowledge-intensive goods and services related to high-technology.

Evaluation of the service sector based on surveys among service providers and service users

The managers responsible for company management and its marketing activities must develop thorough knowledge and understanding of their clients to establish efficient and proper work organisation. Therefore, the service provider undertakes actions aimed at reducing discrepancies between the clients' expectations and the presented offer. It is therefore especially important for the seller in the service sector to know how the client chooses offers and evaluates the level of service provision.

The service user behaves in accordance with a certain decision-making model. This decision-making process includes the following stages:

1) pre-purchase selection of the offers available on the market of possibilities,
2) client reaction during consumption,
3) post-purchase assessment of satisfaction level (GILMORE 2006).

The authors' own surveys conducted on 350 persons[1] (250 service users and 100 service providers) allow formulating certain describable correlations in the services field. The respondents agreed that the service activities were their everyday reality. Over 27% of them admitted to use services on a daily basis. The result seems somewhat underestimated and proves a growing awareness of services among clients. In their understanding, services may be purchased in stores, institutions, offices, health care centres, etc. They do not notice their existence in everyday life, which is reflected, among other things, in watching TV or listening to the radio. When buying certain services, the clients are mostly influenced by Internet advertising (55%), which is the result of the growing servitisation of the world and universal access to the Internet. Fewer persons paid attention to press (7%) and radio advertisements (6%). The consumers often rely on the opinion and experience of their friends (23%). The presented data are shown in Figure 1.

The respondents usually associated services with the benefits received on the local market, for which there is high and flexible demand. On the other hand, when the respondents were asked about using advanced services, they

[1] Full survey was conducted for the purpose of this article. Part of the survey, covering smaller population, was used in the co-author's dissertation. Period covered one academic year.

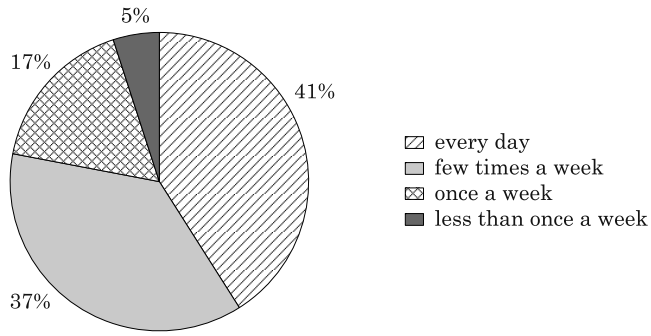

Fig. 1. Frequency of use of services by the client
Source: own elaboration based on the survey.

were of the same opinion that they used them occasionally. Most frequently, the service users use health care (29%) and simple cosmetic and hair services (26%). They rarely decide to pay for small repairs of household appliances (6%) and advanced banking services (4%). Here, it is also possible to find some perception errors with respect to services.

Clients usually assess the quality of the services rendered by the service providers as satisfactory (62%) and identically define satisfaction from the service consumption (64%). Only 11% of them talked about low satisfaction due to service consumption, which – in their opinion – was in 29% a low quality service. The rest of the respondents stated that Polish services are of high quality and a feeling of satisfaction was echoed. The situation when the client does not want to purchase the service again becomes a problem for the service provider. Due to such a decision made by a client, the company may not obtain increased profits in the future. Unfortunately, the service providers do not always understand "client care" properly. They should not treat it as the cost, but as the investment allowing them to obtain substantial profits. Therefore, monitoring of the loss of clients is an important element of the service improvement plan, since the clients who left can teach us how to maintain the loyalty of those who stayed. The most frequent reasons for changing a service provider are the following: the price being too high and errors made by the service provider while rendering a given service. It means that the quality level of services in Poland is still low, the services are rendered in a negligent manner, and the persons offering services do not know the industry.

In terms of service provision, as many as 60% of the respondents placed Poland among moderately developed countries in Europe. Figure 2 shows the evaluation of the Polish service sector by the respondents.

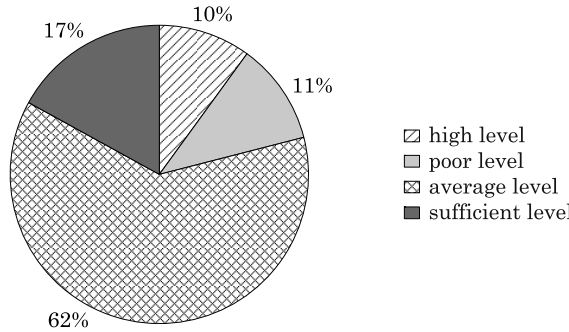

Fig. 2. Evaluation of the Polish service sector by the respondents
Source: own elaboration based on the survey.

The service providers are represented by 100 owners of service entities located within the territory of Poland. Most frequently, the service companies remained on the market for over 10 years (46%) and 5 years (24%). This means that the service activities are profitable. The entrepreneurs receive regular profits, enhance their market positions and remain on the market for a longer period of time. The research showed that the fastest growing sector in Poland is the SME sector, as over 33% of the respondents employ fewer than 9 employees, 19% – fewer than 50 employees, and 15% – fewer than 250 employees.

To start service activities, achieve solid market position and derive the afore-mentioned profits, the enterprises need to face many challenges and obstacles, which hinder their first steps on the market. Figure 3 shows the obstacles faced by the beginner service providers.

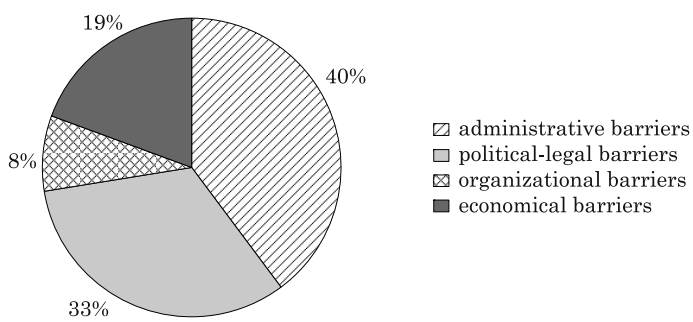

Fig. 3. Main problems when starting a business activity
Source: own elaboration based on the survey.

As many as 39% of the companies mentioned administrative problems related to uncertainty of the law applicable to entrepreneurs, overly extensive documentation, and too much freedom in prevention activities undertaken by

the state. The above-mentioned issues are strongly identified with and lead directly to state policy as well as the laws enacted thereby. 32 service companies indicated a political and legal barrier. The current situation is also confirmed by the fact that 68% of the service providers stated that they could not count on state aid after starting their business. The organizational and economic barriers caused by some internal issues of the companies were problematic for only a small numbers of enterprises.

Generally, the service providers spoke favourably of their services and often stated that they met the high standard of quality; as many as 62% of the companies declared high quality of their services, and only 38% – average. None of the service companies said that their services were of low quality. Figure 4 presents the demand for the services rendered by the service companies.

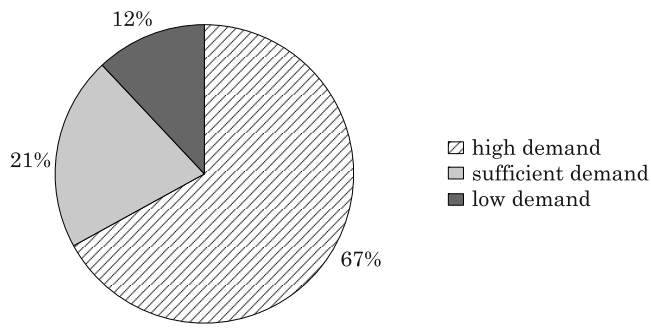

Fig. 4. Demand for the services rendered by a given company
Source: own elaboration based on the survey.

The survey shows good trends on the service market. 21% of the service providers enjoy sufficient demand for their services, and fewer than 70% – high demand. It proves high demand for the fields of industry indicated in the 3rd sector of Polish economy. It also shows high dynamics of economic growth of the sector and forecasts more increases in the GDP generated by the services.

Satisfaction of owners derived from performing service activities is defined proportionally high to the demand, according to Figure 5.

The highest percentage (62%) of the owners talked about a high level of satisfaction derived from the performed service activities. They belong to a group of service providers, who do not intend to change their career within the next 5 years (76%). Only 4% of them were not satisfied with their profile of activities and will probably change careers in the next 5 years (24%).

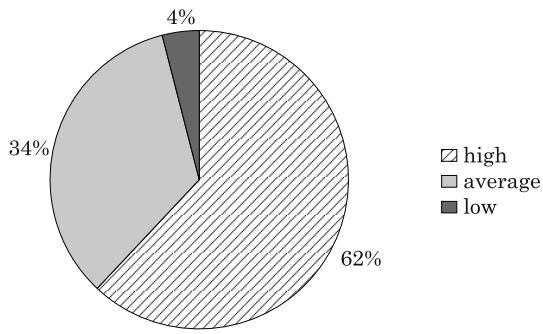

Fig. 5. Satisfaction of service providers derived from the performed service activities
Source: own elaboration based on the survey.

Summary

The issues discussed in the article allow the demonstration of the fact that services play a very important role in the post-industrial development of Poland. Their role has been subject to dynamic change in the global competitiveness environment. Academic theory reveals many different demands concerning the role of services in the economy, which have not been explicitly resolved yet. However, it is obvious that their impact on the country's GDP, employment and general economic growth is unquestionable.

In summary, the conducted analyses and surveys allow to draw the following conclusions:

1. The main problem hindering the service activities are the various obstacles blocking entry into the service market, experienced by approx. 75% of the entrepreneurs starting their business activity. As many as 39% of the respondents indicated administrative issues. The organizational obstacles causing problems to 8% of the enterprisers most often referred to difficulties in raising capital for starting a business (48%) and failures in finding enough employees willing to work under the proposed terms and conditions (30%). It is also a positive phenomenon that newly established businesses, after consolidating their position on the market, achieve profitability, which is satisfactory for 62% of the service providers, who usually have run their business for over 10 years (42%). According to 26% of the respondents, Poland's accession to the EU in 2004 influenced profitability of the service activities.

2. The service sector dominates the two other sectors, mainly as regards the number of jobs in the last decade. Nonetheless, despite this growth, Poland was still behind Western Europe, where the gap with France was estimated as approx. 28 years and with Spain – approx. 18 years with respect to 2010. In the period 1995-2008, the highest increases in employment were noticed in public

administration, national defence and insurance segment. In 2013, the largest number of employees was in the trade and repairs sector – 2131.5k persons, and the lowest number – in the accommodation and catering sector – 249.7k persons. The remuneration paid to the service employees was the highest in 2013 in section J, at the average level of 6165.88 PLN, whereas the lowest – in section I, where the gross remuneration amounted to 2272 PLN at most.

3. 27% of the service users admitted that they used every day various services offered on the market, about which they usually learned from the Internet (55%). Therefore, it may be assumed that the clients have low awareness of services, since they often omitted sewage, radio, TV, etc. services. The most popular were cosmetic and hair styling services (38%) and health care (32%). The least frequently used services included the advanced banking services (6%) and small repairs (4%). The respondents largely evaluated such services as average, which, in terms of services, allows for the classification of Poland among moderately developed countries, which reach approx. 65% of the gross value added from services.

4. The impact of services on the economy manifests itself through boosting economic growth. Such effects can be achieved by shaping GDP, supporting production development, supporting scientific-technological progress and organizational level of economic units. Services are also important factor stimulating and satisfying consumption demand. Moreover, they play an important role as they create fundamental infrastructure for the economies that place services in the center. While analyzing economic processes in Poland, it can be noticed that the process of "industrialization" of services and "servitisation" of industry occurs. Observed growth of importance of the third sector is an universal tendency in the global economy.

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EXTRA ACADEMIC ACTIVITY OF STUDENTS, INCLUDING EMPLOYMENT

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K e y w o r d s: employment of students, extra academic activity.

A b s t r a c t

With the aim of increasing their opportunities for employment after graduating, during their studies students undertake various activities to expand their competences in the areas of experience, knowledge and skills. Such extra academic activity (EAA) includes voluntary service, activities in student organisations and, increasingly frequently, paid employment. As the survey presented in this paper shows, students undertake employment to generate the means for covering the costs of studies and additional expenses not financed by their parents. This offers students a certain level of financial freedom and simultaneously develops their employee competences. The forms and scope of employment are diversified from permanent employment through different types of fixed term contracts to occasional employment. Availability of full time students defined by the plan of studies is the main limitation to employment. Despite the increasing awareness of the usefulness of professional experience in satisfying the expectations of future employers, some students (25%) do not show any extra academic activity, including in the area of employment.

POZAEDUKACYJNA, W TYM PRACOWNICZA, AKTYWNOŚĆ STUDENTÓW

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S ł o w a k l u c z o w e: zatrudnienie studentów, aktywność pozaedukacyjna studentów.

A b s t r a k t

Aby zwiększyć szansę pozyskania zatrudnienia po ukończeniu studiów, studenci podejmują już w czasie studiów różnorodną działalność poszerzającą ich kompetencje w zakresie doświadczenia, wiedzy i umiejętności przydatnych w przyszłej pracy. Aktywność pozaedukacyjna studentów obejmuje wolontariat, działalność w organizacjach studenckich i coraz częściej pracę zarobkową. Jak

wykazały badania prezentowane w artykule, studenci podejmują pracę by pozyskać środki na pokrycie kosztów studiowania oraz dodatkowych wydatków niefinansowanych przez rodziców. Daje to studentom pewną swobodę materialną, a jednocześnie pomnaża ich kompetencje pracownicze. Formy i zakres zatrudnienia są zróżnicowane, od stałego zatrudnienia poprzez różne umowy okresowe do okazjonalnych zatrudnień. Głównym ograniczeniem zatrudnienia jest dyspozycyjność studentów stacjonarnych określona planem studiów. Mimo rosnącej świadomości o przydatności doświadczenia zawodowego, spełnieniu oczekiwań przyszłych pracodawców, część studentów (25%) nie wykazuje żadnej aktywności pozaedukacyjnej, w tym pracowniczej.

Introduction

The consequences of the surplus of supply over the demand for labour over recent years also affect graduates from higher schools. Unemployment among young people, including those with higher education, is higher than in the older age groups. According to the report "The Young Ones 2011" („Młodzi 2011") commissioned by the Chancellery of the Council of Ministers of the Republic of Poland, only a small percentage of employment offerings were addressed to the graduates of higher schools and 33% of those were internship offers (*Młodzi*... 2011). Difficulties with finding employment by people with a bachelors or masters degree results not only from a lack of equilibrium in the labour market but also from maladjustment of the higher education dimensions and structures, including the professional profiles, to the current market needs. Some evaluations indicate clearly that the "current curricula of studies do not offer students a chance to face real business challenges" (KLIMEK-MICHNO 2012, p. 96). In the above-mentioned report, the following were indicated as the major barriers to entry of young people into the labour market (*Młodzi* 2011, p. 138):

– maladjustment of skills demanded by employers and held by the potential employees,

– dissonance between the work related expectations of the graduates and the situation in the labour market,

– discriminatory practices of employers concerning young candidates for employment,

– unclear formulation of the employer's expectations and difficulties in identification of real competences of the potential employee,

– difficulties in start-up of independent business activity.

The contemporary labour market does not offer young graduates stable and well paid jobs permitting self-fulfilment and development in the future. The situation in the labour market is one of the causes of a high fluctuation of young employees taking current short-term jobs on their path to finding employment consistent with their aspirations. Longer-term nonfulfillment of expectations frequently results in emigration and hence people aged 20–29

years form the largest group among economic emigrants. Despite the large extent of migrations, registered unemployment among people with higher education was 12.4% as at the end of 2014 (*Bezrobocie rejestrowane* 2015, p. 18).

The extensive system of private higher education does not always assure the appropriate level of education and is focused on cheap courses of studies, which does not always find market acceptance and is one of the causes of the graduates' difficulties in finding employment. M. Kabaj, among others, drew attention to that fact noticing that a situation may occur, "where the volumes of higher education would exceed significantly the needs of the economy causing new unemployment, this time about higher schools' graduates, and it seems that we would deal with such a situation of graduates in the nearest future as a consequence of an unrestrained and radical increase in the numbers of students at higher schools" (KABAJ 2008, p. 278). The demographic low will decrease the number of candidates and verify the professional attractiveness as well as that of courses of studies and schools.

The extra academic activity, including employment, during studies plays an important role in development of the future professional opportunities of the graduates. The choice of the scope and forms of activity chosen by students may influence their future professional careers. With that in mind, students undertake: employment on commission contracts and specific work contracts (52%), participate in student internships (51.5%), and even try to take permanent employment (13%), or establish their own business (3.1%) (*Badanie studentów* 2013, p. 6). This activity is focused not so much on obtaining funds, but mainly on enrichment of the CV with experience and competences appreciated in applying for a job. Besides the employment activity, students also engage in voluntary services (30.5%), activities of student organisations (28.5%), or scientific clubs (25.9%) (*Badanie studentów* 2013, p. 20). According to the evaluation by students, the activities most helpful in obtaining employment after graduation are work during studies and internships related to the course of studies (94.4%), activity in student organisations (e.g. AIESEC) and external scholarships (e.g. Erasmus) (87.5%) (*Pierwsze kroki...* 2013, p. 23). The significance of employment and extra academic activity of students for competitiveness in the labour market was the inspiration for conducting the surveys presented in this paper.

Objective and scope of study

The objective of the study was to evaluate the causes, scope and forms of employment and other areas of extra academic activity of full time students. The research sample consisted of 192 final year second level students from the

Faculty of Economic Sciences at the University of Warmia and Mazury in Olsztyn, studying courses in management and economies. Final year students of masters degrees had many opportunities to develop extra academic activity during their studies and hence their opinions offer the basis for a wider interpretation of the survey results. The questionnaire-based survey was conducted by electronic means and participation was voluntary. The sample consisted of more female (115) than male students (77), which reflected the gender ratios of students for those particular studies. The number of respondents from courses in management and economics were similar (97 and 97 persons respectively). These courses of study belong to those most frequently chosen nationally. This results in strong competition among graduates from those courses in search of a job.

Results of studies

Professional experience is an important criterion in employee recruitment. The professional activity of students increases their competitiveness in the labour market after completing education. Awareness that the requirement of experience plays an increasing role in obtaining a job is common among students. This is confirmed by the fact that only 16% of the respondents have never worked. Most frequently, students performed occasional jobs (41%); however, some of them (11%) had worked for longer than a year. Financial issues related to payment for studies or personal expenses, including holidays, were dominant reasons for taking paid employment. Financial benefits were in most cases combined with the opportunity of obtaining professional experience. Necessity (lack of funds for studies, demand by parents), willingness to improve their living standards (financial independence) and sometimes excess of free time (24% of responses) were additional reasons for taking paid employment. However, despite these reasons, acquiring professional experience was an expectation and the derivative outcome of employment. The results of those studies differ from the results of national studies in which students indicated willingness for obtaining professional experience (60% of responses) as the main reason for taking employment during studies (*Badanie studentów* 2013, *Młodzi*... 2011). The differences in the results of the surveys could result from the fact that the region of Warmia and Mazury is among the poorest, with the lowest income levels in the country. Hence, the need for generating income is the major reason for undertaking employment during studies among students from this region. Obtaining professional experience is the secondary benefit.

The place of employment and function held were highly diversified (Tab. 1). In most cases, these were positions requiring no special qualifications. Employ-

ment was mainly based on commission contracts or specific work contracts. The "black" work, i.e. work without a contract, was also significantly represented. Such employment, in addition to being an infringement of the law, does not allow the student to document professional employment and is considered by employers as evidence of not respecting the principles of social responsibility. Fixed term contracts or unspecified term contracts occurred in individual cases and in practical terms they are unavailable to students.

Table 1

Place of student employment and position held

Place of work/position	% of responses N=124
Bar, club, restaurant/waiter	27
Shop/sales assistant	23
Office/secretary	18
Call Centre/telemarketer	14
Temporary Employment Agency /hostess	11
At home /translator (freelancer)	8

Source: own surveys.

The working hours of students are also diverse. In most cases, students work on weekends only, but for longer hours; from 9 to 11 hours and longer (30 responses). A relatively high proportion of students worked 3–4 times a week for 5–6 hours (23 persons) or 7–8 hours (10 persons) while 25 students worked 5–6 times a week for 5 to 8 hours. The other persons worked more occasionally with different frequencies from week to week and for different hours. The structure of work frequency and time depends to a significant extent on the availability of students defined by their plan of classes at school.

The Internet (80% responses), friends (42%) or press announcements (19%) were the main sources of information on jobs for students. It was relatively rare for students to use the Bureau of Careers operating at the University and its information on available jobs.

Availability is the main criterion dictating student employment (Tab. 2). Earlier professional experience is often significant while in some cases characteristics consequential to the special requirements of the job, such as gender in the case of manual work, knowledge of the language (work at the reception, translation) or dedication in the job of telemarketer, are also of importance. Not satisfying those requirements is a barrier to obtaining the job. The other barriers are a shortage of jobs and competition resulting from high unemployment and, sometimes, laziness (5% of responses).

Table 2

Student employment conditions

Recruitment criteria	% of responses* N=124
Availability	80
Experience	42
Qualifications	31
Gender	25
Place of residence	22
Course of studies	14
Command of foreign languages	10
Other: elocution	8

* – multiple choice option
Source: own surveys.

In total, 74% of the respondents rated the situation in the labour markets for students and graduates as bad or very bad. This covers not so much the availability of jobs, because a high proportion of graduates find employment, but the employment conditions such as wages, lack of contracts or unfavourable contractual conditions. Both working and non-working students expressed negative opinions about the labour market. Those opinions matched the results of the national surveys (*Pierwsze kroki*... 2013, p. 28). At the same time, the referenced surveys showed that students considered their chances in the labour market as rather high (*Młodzi*... 2011, p. 25). This indicates a certain contradiction resulting from applying the stereotype, common opinions on the labour market in general and the real evaluations concerning graduates.

The opinion on the opportunities in the labour market also influences the migration plans of students. Among the students surveyed, 33%, including the majority of those working, did not intend to search for a job abroad while 22% of the working and a half of non-working respondents considered permanent emigration. The others considered temporary migration (12%) or made the decision dependent on the future situation (23%). Students that did not work and those living in the countryside projected migration abroad more frequently (65%).

More than half (60%) of the students surveyed did not use extracurricular practice and internships. Remunerations for student internships and practice are a controversial issue and there is a difference of opinion concerning them. Interns and practicing students indicate that the lack of remuneration is irritating. Employers, on the other hand, claim that the results of work by practicing students or interns do not cover the costs of employing them. Indifferent to the lack of remuneration for internships/practice (25% of respondents agree to lack of remuneration), it is important for students to

have them in companies with an established image so as to receive good references from an esteemed company and to get the opportunity of establishing professional contacts helpful in finding employment in the future.

Only 43% of the respondents participated in activities of student scientific clubs, of which the major benefits are the opportunity of meeting interesting people (69% of responses) and acquiring organisational experience (60%). Expanding knowledge through participation in conferences and training programmes is appreciated less.

The students surveyed showed relatively good knowledge of student organisational functioning in the school, but they did not show much involvement in their activities. AIESEC, with 166 responses, was the best-identified organisation followed by the Academic Enterprise Incubator (131 responses) and Erasmus (89 responses). Only 15 respondents, however, were AIESEC members while only individual persons indicated membership in other organisations. Regardless of the membership and activity in different organisations, including Students' Self-Government, student clubs (cultural, sports, tourist, etc.) and volunteer services, students recognised the benefits from extra academic activity (Tab. 3). Those benefits which expand competences and increase opportunities for obtaining a job after graduation, according to the students, included mainly development of creativity, skills of working under time pressure, skills of self-presentation and organisation of one's own and team work.

Table 3

Skills and competences developed by extra academic activity

Competences	% of responses* N=124
Creativity, inventiveness	153
Skills of working under time pressure	133
Skills of self-presentation	121
Negotiation skills, assertiveness	78
Communication skills, skills of working in the team	22
Skills of organising own work	68
Knowledge on management	52
Independence	47

* – multiple choice option
Source: own surveys.

After graduation, the vast majority of the students surveyed would like to work in line with the course of studies completed. One third of them dream about establishing their own business. The results of surveys indicate that students rate positively their chances for finding work consistent with their education after graduation (coefficient 2.66 on a scale of 4 – very high to

1 – very low). A positive perception of a professional future may result from the experience acquired from work during their studies and other forms of extra academic activity. Those experiences increase the feeling of self-confidence and belief in their opportunities in the labour market.

Conclusion

The real evaluation of the situation in the labour market means that students undertake different forms of activities that expand their competences and thus increase their chances of obtaining satisfactory employment. Paid work is the main form of student activity, which is not only the source of funds but also offers benefits potentially increasing their employment potential through the acquisition of practical knowledge, establishing relations, obtaining knowledge of the labour market, skills of self-presentation, etc. Unfortunately, a proportion of students (25%) do not undertake such activity. Limited availability resulting from the process of studies is one of the barriers to employment for full time students. Various forms of flexible employment and flexible work time are helpful. Common awareness of the usefulness of professional experience gained during studies in applying for employment after graduation does not always translate into actual extra academic activity. The presented studies showed that both the awareness of the need for such activity and the actual extent of such activities are increasing significantly.

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FORMAL EDUCATION OF POLISH SOCIETY AS A FACTOR AFFECTING HUMAN CAPITAL

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K e y w o r d s: education, human capital, level of education.

A b s t r a c t

Human resources in Poland have varied and valuable features and components that constitute significant human capital. A steady increase in the educational level of the society has a beneficial effect on the formation of capital. This study attempts to show the changes in the education of Polish society during the period of 1990–2014.

FORMALNE WYKSZTAŁCENIE POLSKIEGO SPOŁECZEŃSTWA JAKO CZYNNIK WPŁYWAJĄCY NA KAPITAŁ LUDZKI

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S ł o w a k l u c z o w e: edukacja, kapitał ludzki, poziom wykształcenia.

A b s t r a k t

Na zasoby ludzkie w Polsce składa się wiele zróżnicowanych i wartościowych cech i składowych, które stanowią znaczący kapitał ludzki. Stały wzrost poziomu wykształcenia społeczeństwa wpływa korzystnie na kształtowanie wartości kapitału. W opracowaniu podjęto próbę ukazania zmian w wykształceniu społeczeństwa polskiego w okresie 1990–2014.

Introduction

The most valuable asset of any country is the people, the center and the purpose of economic progress (TSURU 1986, p. 14). W. Petty said that the personnel value exceeds about 70% the value of all movable and immovable property of England (PETTY 1699, p. 192 as cited in: DOMAŃSKI 1993, p. 31). At the end of the twentieth century in the early 90s, G. S. Becker estimated that the value of the human capital of the United States approaches the amount of 154 billion dollars, more than three times the value of the financial assets of the country (BOCHNIARZ, GUGAŁA 2005, p. 11). One of the basic factors of socio-economic development of a country, different regions, towns and villages, and even enterprises is human capital. Its components and roles are dependent not so much on the cardinality of the population employed, but above all on the level of knowledge, skills, entrepreneurship, health and other characteristics taken into consideration in studies.

All of these and other desirable properties of human capital are formed at a given time by investment in people. They contribute not only to physical development but primarily serve the shaping of personality and the intellectual development. The quality of human resources is the result of long-term demographic changes, taking place under the influence of many factors. Authors are mainly interested in the intensity and level of education.

Therefore, special attention was paid to the results of studies in Poland, divided into urban and rural areas. In the country in the last decade of the last century and at the beginning of this century, there was quite a radical transformation of population, which is confirmed by variables describing the most important phenomena, processes, demographic and social-economic structure. Without going into detail, it is worth noting that most of all there was a weakening dynamic of population growth and an overall size and intensity of the mobility of the population also significantly changed the structure of the population. In addition to decreasing mobility, noticeable changes also exist in the directions of migration. There remains, of course, without affecting the spatial structure of the population, changes in the numerical proportion of the urban and rural population, and a change in some structures and processes of reproduction of the population. It is worth noting that the structure of the population was uniquely improved by the level of education, which raises the value of human capital.

For many years the development of urbanization in Poland was fascinating, mainly there was a flow of population from rural to urban areas. In rural areas of the country, however, there remained a significant percentage of the population, and in recent years it can even be observed an increase in this part

of the population. It is worth noting that in terms of quality, it is a significantly different population than a dozen years ago. Human resources in both urban and rural areas are an important factor in development.

The introduction to the content presented in the article is the presentation of the structure of the population in Poland. Presenting the status of the population allows better visibility of the diversity of public education.

Macroeconomic aspects of human capital consider social education as one of the main factors of transformation and development of human capital (POCZTOWSKI 2007, p. 30–31). The primary objective of the study is to show the changes in the levels of education of the Polish population.

The basic time watershed is represented by the date of the general population censuses in 1988 and in 2011. This paper considers the Central Statistical Office estimates from between the census period. Necessary statistical data comes from the CSO. Also essential were the editions of the Demographic Yearbook. The Little Yearbook reports the results of the 2011 Census. They contain the necessary figures, indicators and ratios that characterize various phenomena, processes and demographic structure allowing for comparative methods used and the descriptive statistics. The authors admit that the article does not exhaust the rich range of studies devoted to the discussed topics, and is an attempt to present a synthetic description.

Changes in the structure of the population

At the end of the year 1988, Poland had a population of 37 885 thousand people. Starting from 1997 to 2007, a downward trend was observed, and in the last period from 2008–2012 was again marked by a growth in the numbers. Changes are noticeable, taking into account the division into urban and rural areas. In the urban areas it was followed by a steady increase until 1991, and since 2000 we are already witnessing a steady decline in the overall state population. Details are located in Table 1.

In the year 1988, rural areas had a population of 14 698 thousand, in the following years a decline in numbers was noticed until 1991, after which there was a marked increase in 1992. But it was not a steady increase, since in subsequent years the population has been shrinking in growth again, assuming the shape of a sine wave – a process that lasted until 2000. From this year, there followed the growth of the ruralization ratio to 39.4% of the total population of the country. People living in rural areas exceeded the rate of 39% of the Polish population. It is worth noting that, as compared with highly

developed countries in Europe and other continents, it is a high indicator. Rural area have a huge demographic potential, as evidenced by indicators and ratios presented in Tables 1 and 2.

Table 1

Polish population in the years 1990–2014

Specification	1990	1995	2000	2005	2008	2010	2012	2014
State as of 31 XII	38 183	38 609	38 254	38 157	38 136	38 200	38 533	38 479
Including								
Per 1 km^2	122	123	122	122	122	122	123	123
Women in thousands	19527	19823	19717	19703	19721	19756	19884	19859
Per 100 man	105	106	106	107	107	107	107	107
Urban in thousands	23 614	23 876	23 670	23 424	23 288	23 264	23 336	23 216
In %	61.8	61.8	61.9	61.4	61.1	60.9	60.6	60.3
Rural in thousands	14 569	14733	14584	14733	14848	14936	15197	15 262
In %	38.2	38.2	38.1	38.6	38.9	39.1	39.4	39.7

Source: *Mały Rocznik Statystyczny Polski 2015* (2015).

The trends depicted above show an almost constant level of observed population density and a constant proportion of men and women. In contrast to rural areas, urban areas have not only higher rates of pre-working age population, but also a sub-population of post-working age, continually increasing. This is due to the long-term flow of young people from the countryside to the cities. The increase in the median age and general changes in the age structure of the population are a symptom of the ongoing process of demographic aging as a negative phenomenon from the viewpoint of reproduction indicators, which provide demographic forecasts.

Also, this does not positively shape the numerical relationships of people of working age and non-working age, which will have a negative impact on the declining growth of the labor force. In the structure of the non-working age population wanes children and young people and comes from the elderly population, especially in the cities. Basic statistical information is presented on the population of rural and urban areas and is the basis for verification of the level of education in these groups. The macroeconomic aspect of considering human capital takes into account education, health care and the conditions of the labor market (CIEKANOWSKI 2014, p. 137–138) as key determinants shaping the differentiation potential of the country's population.

Table 2

Changes in the Polish population by sex

Years	The median age of the population		Population age						
			Under 20		65 and higher	working age	non-working per 100 people of working age		
	men	women	total	0–14			total	pre-working	post-working
			in % total						
Total [in %]									
1990	30.9	33.7	31.8	24.4	10.2	58.7	72	50	22
1995	32.0	35.3	29.7	21.6	11.3	59.6	68	45	23
2000	33.4	37.4	27.8	19.1	12.4	60.8	64	40	24
2005	34.7	38.9	23.7	16.2	13.3	64.8	56	32	24
2010	36.3	39.9	21.4	15.1	13.6	64.4	55	29	26
2012	37.0	40.5	20.8	15.0	14.2	63.9	57	29	28
2013	37.4	40.9	20.5	15.00	14.7	63.4	58	29	29
Urban areas in %									
1990	31.5	34.2	30.8	23.3	9.1	60.3	66	46	19
1995	32.7	36.2	28.1	20.0	10.5	62.0	62	40	21
2000	34.2	38.8	25.9	17.1	11.7	63.3	58	35	23
2005	35.5	40.5	21.6	14.5	13.1	66.0	52	28	24
2010	37.0	41.7	19.6	13.6	14.0	65.2	53	26	27
2012	37.8	42.2	19.0	13.9	15.0	64.2	56	26	30
2013	38.2	42.6	18.8	13.9	15.7	63.5	58	28	31
Rural areas in %									
1990	30.1	32.6	33.4	26.2	12.0	54.6	83	56	27
1995	30.9	33.6	32.3	24.3	12.6	55.6	80	53	27
2000	32.2	34.9	30.9	22.2	13.4	56.8	76	49	27
2005	33.6	36.2	27.1	18.9	13.6	60.2	65	39	25
2010	35.2	37.4	24.3	17.0	13.0	63.2	58	34	25
2012	35.9	38.1	23.6	16.8	13.7	63.4	58	33	25
2014	36.2	38.4	23.1	16.7	13.3	63.4	58	32	26

Source: *Rocznik Demograficzny 2014* (2015).

The nature and components of human capital

The main reason for the development of human capital theory was an attempt to solve the problem of imperfectly described growth formulas (DOMAŃSKI 1993, p. 14). When it was discovered that a significant portion of the income of the United States cannot be explained by an increase in tangible

capital or labor, it initiated a search for different factors which can be attributed to the rest of the existing value. The search for explanations were made first by G.S. Becker and T.W. Schultz. The first one in the preface edition of his book from the year 1975 admits that it took him a quarter of a century (BECKER 1975, p. 8)[1]. Their creative contribution to the solution of this problem has gained the highest recognition, both researchers in their later years received the Nobel Prize. Their creation of the theory of human capital is treated as a tool to facilitate the understanding of economic growth.

The authors mentioned by S.R. Domański are considered by him as coauthors of the theory (DOMAŃSKI 1993, p. 10). Similar statements are also included inside the report by J. Mujżel, T. Kowalik, B. Fiedor and E. Mączyńska developed for the Socio-Economic Strategy at the Council of Ministers (*Kapitał ludzki*... 1998, p. 14–15). Both creators of the theory, as well as other scientists, mention many other authors who have previously engaged in some of the components of this thoery. S.R. Domański mentions in this context a few Poles: S. Staszic, K. Grabiński and F. Skarbek. Among the many foreign authors who have made a contribution to the development of human capital theory, many are from the seventeenth century. They are most often mentioned by W. Petty, A. Smith, J.B. Say, F. List, J.S. Mill, A. Marshall, I. Fisher (WRONOWSKA 2005, p. 123–124).

A very important issue is the definition of human capital and its components. According to J. Grodzicki and G. Łukasiewicz, the first time the concept of human capital in the literature was used was by T.W. Schultz in 1961 (GRODZICKI 2003, p. 46, ŁUKASIEWICZ 2009, p. 16). An article published in the American Economic Review initiated a series of further publications in which that term was initially used only in the macroeconomic context. The use of the term human capital was used in explaining the high economic growth that occurred in many countries after World War II. It was noted that tangible investments were unable to produce the large increase that was observed. The factor that allowed the appearance of economic growth was described as investments in human capital (LIPKA 2010, p. 23–24).

The definition formulated by T.W. Schultz, who cites in his article W. FLORCZAK (2007, p. 651), is "through human capital in a broad sense is understood all the features of psychophysical entities, such as innate abilities, knowledge, education, skills and experience, health status, cultural level, socio-economic activity, beliefs, etc. that impact directly or indirectly on performance and which are inextricably linked with man as the carrier of these values".

[1] Compare: (SCHULTZ 1976, p. 7).

In the literature many definitions are distinguished. They can be divided into two groups, the first is based on identifying the components of human capital. The second group of definitions has a holistic character and is based on the ability to build value by the capital owner (BARON 2007). The theory of human capital, despite a high level of development, has not been worked out so far into one definition in this socio-economic category. Human capital is considered to be a resource and a capability, at individual and organizational levels. Individual human capital can be acquired by attracting and selecting employees with the right skills and experience. It can be developed through learning (INGHAM 2007, p. 103). This intangible asset is given by the genetic characteristics of the population once and for all, but it can be increased through investments called investments in people.

Existing definitions can be adopted as the basis for discussion on the role and importance of human capital in growth theory. Many authors emphasize the status of certain components and understand human capital as the knowledge and skills of a certain value as a source of future earnings or satisfaction, which is renewable and is constantly enlarged as human potential. Of course, many distinguished writers stand on human capital in the broad sense and in the strict sense.

G. Łukasiewicz. takes into account the so-called cost approach, He believes that human capital is accumulated in human abilities, knowledge, health or skills, to whose achievements are needed cash outflows. The capitalized sum of these expenses result in a unit value of human capital. K. Makowski lists two basic methods of estimating the size of human capital, taking into account several variants. These are: a method of capitalization based on the expected income stream, a method involving the production costs of human capital and its various components. The various aspects of the definition of human capital are only a synthetic presentation of the basic theory.

Human capital may be smaller or larger to a great extent independent of the demographic potential of a society. The human capital does not change exactly as the population of a country or region changes (DOMAŃSKI 1993, p. 19, ŁUKASIEWICZ 2009, p. 17). There may be a numerically weak country, which has powerful human capital. Thus, the value of accumulated human capital in a given society does not need to be positively correlated with the amount of the population. This is due to the fact that human capital considers quantitative and qualitative aspects.

Based on some of the listed definitions, it could be deduced that the human capital of the population grows infinitely. That is not so. Analogous to tangible assets, human capital in the process of management is also consumed, which is the result of transferring a portion of its value on effect. A distinction is made between the biological and moral use of human capital. In considering the issue

only as a biological phenomenon, transient depreciations stand out, the partial and total loss of the ability to work. An even more dangerous phenomenon of depreciation is the recapitalization of the human body, resulting from the nature of its exploitation, especially in the long-term. The depreciation can also take a different form, among others absolute and relative recapitalization stands out.

A part of the definition is demographic investments. There are many entities implementing this type of investment. There is a fairly well-defined catalog of measures for investment purposes, as well as also some controversy regarding the various expenses that can be considered as investments in personnel.

S.R. Domański defines investments in personnel as all activities that affect the future financial and physical income by increasing human resources (DOMAŃSKI 1993, p. 19). Of all the activities which imply certain expenses, extract the ones in the nature of consumption. It is necessary to take into account the effect they bring. Domański wrote that "if the effect of this is to increase the productivity of the human factor, these expenditures are investments, but if the growth of pleasure, utility, which is the ultimate goal, expenditures are included in the consumption process".

Research on human capital issues can be comprehensive, which means that it covers all issues or selected ingredients. They may be conducted at the micro, meso and macro levels. The Report of the Socio-Economic Strategy of 1998, determined that in narrow terms human capital is recognized as embodied in the quality features available in the economy of the labor force effect of investment in education and training (*Kapitał ludzki...* 1998, p. 14). The main objective of this paper is to present changes in the level of education of the Polish population. According to some authors, the narrow interpretation of human capital is the result of investment in education and training embodied in the quality characteristics of the labor force (CZYŻEWSKI 2001, p. 6). It can be assumed that nowadays expenditure on education and training are treated together, so also accept it authors of this paper.

Polish population by level of education

"Education in every sense is one of the fundamental factors of development" (OZTURK 2001). It also manifests a great impact not only upon productivity, but also on poverty, trade, income distribution, generating a basis for development, at the microeconomic and the macroeconomic level (DEMYEN 2015, p. 54). In the process of socio-economic development and the progress of civilization, the level of education of the population plays an important role.

The results of the subsequent censuses, as well as estimates made for the periods between the census periods shows that the overall level of education of the population is improving.

Table 3

Polish population aged 13 and older by education level in 2002 and 2011

Specification	Year	Total in %	Urban areas	Rural areas
Total	2002 2011	100 100	100 100	100 100
Higher education	2002 2011	9.9 17	13.2 21	4.2 9.9
Post-secondary	2002 2011	3.2 2.6	3.9 3.2	1.9 1.6
Secondary together	2002 2011	28.3 29.0	33.4 32.1	19.6 23.9
Vocational	2002 2011	19.7 17.2	22.3 18.5	15.3 15.1
General secondary	2002 2011	8.6 11.8	11.2 13.6	4.3 8.9
Basic vocational	2002 2011	23.2 21.7	20.4 18.6	28.0 26.5
Primary completed	2002 2011	29.8 18.3	23.9 13.7	39.7 25.6
Remaining population	2002 2011	5.6 6.5	5.1 6.6	6.6 6.4

Source: *Rocznik demograficzny 2014* (2015).

It should be noted and reported in the statistical tables that they are not fully comparable. Table 3 includes people aged 15 and over, while in the next table the age limit was lowered to 13 years. It became so because of the education reform in 1999 introducing a 6-year primary school and three years of lower secondary school. The census of May 2002 did not include graduates from high school from June 2002. For this reason, in 2002 data is given in two versions.

The data in Table 3 shows that there has been a considerable increase in the proportion of the population with post-secondary and secondary education and higher education. Since 1988, there have been minor changes in the percentage of people with vocational education. In contrast, there has been a reduction in the share of the population with basic education not completed and no primary education has been identified as the remaining population.

If the data from 1988 we take as 100 in the period up to the next census in 2002, the population aged 15 and older has increased to 110.7%. The highest growth during this period occurred in relation to the population with post-secondary education. A significant increase can also be spotted for people with higher and secondary education, especially general education. At the same time, the percentage of the population with primary education has been reduced and is called "others". The direction of change should be assessed very positively.

Given the nature of socio-economics and the diverse structure of the population living in villages and cities, considerable differences can be seen in the level of education of the population of the two communities. Also, the dynamics of change in this regard is unevenly shaped.

It can be noticed that there is a difference in the labor market in these two environments. It's perfectly understandable if we take into account the fact that rural areas do not have functioning universities, courts, prosecutor's offices, theaters, etc. Institutions which obligatorily need to employ persons with a university degree and diplomas are also absent from rural settings. Thus, it can be simple that when it comes to the workforce in rural areas, there is relatively more demand for workers with vocational, secondary and post-secondary education. The realistic state of the two communities in terms of educational levels, are shown in tables 3, 4 and 6.

The data contained in these tables show that the urban areas actually focused relatively more personnel with higher, secondary and post-secondary education. Analysis of growth rates between the census periods indicates a relatively high increase in people with post-secondary and secondary vocational education. At a similar level were indicators of population with higher education and secondary education. Of interest is the relatively large increase of population with unfinished primary school or without primary education.

On the other hand, it should be positively assessed that there was an increase in the level of education in rural areas. The share of the rural population aged 15 years or older with higher education has doubled and has increased from 1.8% to 4.3% with secondary education increasing from 12.1% to 20.4% of vocational from 24.2% to 29 2%. At the same time, there has been a reduction in the percentage of population with a completed primary education, as well as those classified as other.

CSO estimates made after 2002 include reducing the lower age limit to 13 years and the recognition of lower secondary education. Table 4 shows the results that inform about further positive changes in both urban and rural areas.

Table 4

Polish population by level of education

Specification		Total	Including education				
			higher	post-secondary and secondary	basic vocational	lower secondary	completed primary
In thousands							
Total	2002	32 435	3203	10 551	7540	x	9652
	2005	33 008	4699	10 908	7590	1802	7182
	2010	33 273	6408	11 176	7296	1780	6003
	2011	33 505	5693	10 573	7260	1651	6133
Males	2002	15 550	1448	4290	4679	x	
	2005	15 814	1968	4793	4669	940	3148
	2010	15 912	2555	5079	4465	981	2607
	2011	16 075	2375	4680	4490	883	2644
Females	2002	16 886	1755	5912	2860	x	
	2005	17 194	2371	6115	2921	862	4034
	2010	17 361	3852	6097	2831	799	3397
	2011	17 429	3318	5290	2771	768	3489
In %							
Total	2002	100	9.9	31.5	23.2	x	29.8
	2005	100	14.2	33	23	5.5	21.8
	2010	100	19.3	33.6	21.9	5.3	21.8
	2011	100	17.0	35.3	21.7	4.9	18.3
Males	2002	100	9.3	27.6	30.1	x	28.0
	2005	100	12.4	30.3	29.5	5.9	19.9
	2010	100	16.1	31.9	28.1	6.2	16.4
	2011	100	14.8	29.1	27.9	5.5	16.5
Females	2002	100	10.4	35.1	16.9	x	31.4
	2005	100	15.9	35.6	17.0	5	23.5
	2010	100	22.2	35.1	16.3	4.6	19.6
	2011	100	19	33.8	15.9	4.4	20.0

Source: *Rocznik demograficzny 2014* (2015).

A positive occurrence is a clear increase in the proportion of people with higher and secondary education. Basically, at a stable level the proportion of people with secondary and post-secondary education is holding. The downward trend can be observed in relation to the population with vocational and completed basic education. The relatively higher share of young people with lower secondary education in rural areas should be assessed positively. An undesirable state is a delay in the completion of primary school for children living in rural areas, especially for girls. It should be emphasized that generally in all years and types of research the percentage of women graduates in universities and secondary schools and post-secondary education are much higher than for men. This applies to both urban and rural areas.

The latest data of the structure of the Polish population according to educational level as provided by the census from year 2011.

Table 5

Population aged 13 and more by level of education and gender

Level of education	2002				Male		Female	
	in thous.	in %	in thous.	in %	2002	2011	2002	2011
Total	32 435,4	100	33 505,3	100	100	100	100	100
Included								
Higher	3203.6	9.9	5690.2	17.0	9.3	14.8	10.4	19.0
Post-secondary and secondary	10 208.4	31.5	10 573.7	31.6	27.6	29.1	35.1	33.8
Basic vocational	7539.8	23.2	7260.7	21.7	30.1	27.9	16.9	15.9
Lower secondary and Completed primary	9651.8	29.8	7788.4	23.2	28.0	22.0	31.4	24.4
Basic incomplete and no education	1180.1	3.6	457.1	1.4	3.0	1.0	4.3	1.7

Source: *Raport z wyników Narodowego Spisu Powszechnego Ludności i Mieszkań* 2011 (2012, p. 58).

A conversely shaped situation is with regard to basic vocational education. In this case, more men than women completed this level of education. The decline has been for further shares of boys and girls completing primary and lower secondary schooling. In this case, the girls performed better than boys with regards to indicators. While the opposite situation can be noticed in the case of people not completing primary school or having no school education. Here slightly higher rates apply to women. Another area of analysis is the structure of the educational level for verification of rural and urban populations.

Table 6

Population aged 13 and more by level of education, gender and place of residence

Level of education	Urban areas			Rural areas		
	total	male	female	total	male	female
	in %					
Higher	21.3	19.4	23.2	9.9	7.7	12.1
Post-secondary and secondary	35.2	33.1	37.3	25.5	23.1	27.9
Basic vocational	19.0	24.2	13.7	26.6	33.6	19.6
Lower secondary and Completed primary	17.9	16.6	19.2	31.6	30.0	33.3
Basic incomplete and no education	0.9	0.7	1.0	2.1	1.6	2.7

Source: *Raport z wyników Narodowego Spisu Powszechnego Ludności i Mieszkań* 2011 (2012, p. 60).

It can be seen that in the urban areas the parental level of education is average, calculated together with post-secondary education. Its share has, however, decreased slightly from 38.5% in the year 2002 to 35.2% in the year 2011, which was shown in the last census. In next place, in terms of value indicators, is the population with higher education, vocational and completed primary and post-secondary education, and it is worth noting the different proportions of men and women. A notable observation is the significant decrease in the percentage of persons with primary education not completed and no primary education.

Table 7

Population aged 13 and older continuing education by level of education and the learning model

Level of education	People who continue their education		
	total	full time courses	evening classes, distance learning
	in %		
Total	100	100	100
Higher with a masters degree. doctorate or equivalent	4.6	1.6	13.9
Higher with engineering degree. bachelors. or certified economist	8.1	4.2	20.2
Secondary vocational. post-secondary	7.3	2.7	21.9
Secondary general	21.2	10.0	31.6
Basic vocational	1.9	0.4	6.6
Primary and lower secondary	54.7	70.2	5.9
Basic incomplete and no education	2.2	2.9	0.0

Source: *Raport z wyników Narodowego Spisu Powszechnego Ludności i Mieszkań* 2011 (2012, p. 62).

In rural areas, completed primary education continues to dominate. Its total share with lower secondary education increased in 2011 to 31.6%. In second place was people with vocational education and in third were people with an average post-secondary education. Also, in the rural areas further differentiation of educational level may be formed by gender. Men can be characterized with the relatively highest basic education, while women were characterized mainly by completed primary education and lower secondary education.

Analyzing the educational level of men and women on the basis of census results, it can be noted that in both urban and rural areas, women more often than men have a university degree, as well as secondary and postsecondary education.

A positive development is that a large proportion of Poles who have completed 13 years or more still continue their education at a given level. The 2011 census provided information that these people number more than 5 million. Among which more than 3773.2 thousand study in full time courses.

As established on the basis of the Census, graduates of elementary and secondary schools continue their studies mainly in full time courses, which is 70.2% of the total number.

In turn, graduates of secondary schools participate in evening classes or distance learning. This method is also an option for graduates of further education.

Among those continuing their education, a higher percentage are urban dwellers. Nearly half of the men and women who continue their studies do it on a full time basis, and this applies to both urban residents and rural areas. Given the people who continue their education in absentia, it can be seen that often women choose that way of raising their level of knowledge.

Regardless of the mode, gender or residential environment, the most important thing it is that many people continue their studies. According to Eurostat, the proportion of people aged 18–24, which have at most a lower secondary education and do not continue learning in Poland was one of the lowest among EU countries. In the future, this will have an impact on further growth in the value of human capital in the country. It should be noted that there are large disparities in the quality of education in the country, which means that the increase of knowledge will not be identical for different regions or graduates of higher education units. This could be a subject for further consideration, which may allow a more precise determination of the contribution of the level of education as a factor that affects the human capital value.

Conclusion

The macroeconomic approach to human capital is based among others on the verification of levels of public education. Aspect macro allows an examination of education to be performed on the scale of an entire society or at the individual level (MATUSIAK 2009, p. 311, ŁUKASIEWICZ 2009, p. 23). This paper is based on the available statistical data and presents changes in the number and structure of Polish society. This paper shows changes in the level of education of the population in the years 1988–2011, taken on a percentage basis.

The demographic situation in Poland in the last two decades has fundamentally changed. In addition to positive developments, elongation of the

average duration of education, and improvement of population quality in terms of the level of education have been observed. Conditions conducive to the development of education contribute to the increase of knowledge and skills of the members of the community. The human capital recovered subsequently by employers and adequately developed by them leads to improving the competitiveness of enterprises, and thus contributes to the macroeconomic development of the region and the whole economy by improving the level of competitiveness (JARECKI 2003, p. 192–193).

Unfortunately, the evaluation of the presented process is largely dependent on the level of quality of the human capital which is generated in a given society by a functioning educational system. It is therefore advisable to implement changes, which not only increase the percentage of the population with higher levels of education, but allows for the creation of appropriate specialization of human capital.

Further verification based only on the state of quantitative data from the Demographic Yearbook of Poland from the year 2014 reveals some disturbing factors, the occurrence of which will not help to build the high potential of the society. Among the major trends characteristic of Polish society can be distinguished: the declining birthrate, the progressive aging of the population, declining spatial mobility, increasing disintegration of families, persistent negative net international migration, and high unemployment (*Rocznik Demograficzny...* 2015).

Increasing the level of formal education in the society proves that there is a greater awareness and the need to develop among the Polish population. Although this is a very desirable phenomenon and according to the theory of human capital education is part of the macroeconomic consideration of this category in the initial stage of building a conscious path of development by society, in order to increase the level of human capital it is necessary to supplement the impact of macro-scale in the areas of healthcare and increase the compatibility of human potential in the labor market. Formal education needs to increase its specialization and improve the level of cohesion for the needs of enterprise.

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RULE-BASED VERSUS DISCRETIONARY FISCAL POLICY

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K e y w o r d s: Maastricht Treaty, fiscal rules, discretionary fiscal policy, credibility of fiscal policy, flexibility of fiscal policy.

A b s t r a c t

Fiscal policy can be of a discretionary or rule-based nature. This article discuses selected examples of fiscal rules as well as presents the advantages and disadvantages of following them. The aim of the article is to solve dilemmas about the positive and negative consequences of strict regulations of contemporary fiscal policy. Therefore, a hypothesis is tested concerning whether the following of rules in macroeconomic policy is a more beneficial solution than carrying out a discretionary policy. The hypothesis was not clearly verified. On the one hand, it was stated that it is usually more beneficial to follow standard rules due to higher reliability for markets. On the other hand, that entails lower flexibility, which may be especially disadvantageous during a crisis.

REGUŁY A UZNANIOWOŚĆ W POLITYCE FISKALNEJ

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S ł o w a k l u c z o w e: traktat z Maastricht, reguły polityki fiskalnej, dyskrecjonalność w polityce fiskalnej, wiarygodność polityki pieniężnej, elastyczność polityki pieniężnej.

A b s t r a k t

Polityka fiskalna może mieć charakter uznaniowy lub oparty na regule. W opracowaniu zaprezentowano wybrane przykłady reguł polityki fiskalnej oraz przedstawiono koszty i korzyści związane z ich stosowaniem. Za cel artykułu przyjęto rozstrzygnięcie dylematów związanych z pozytywnymi i negatywnymi konsekwencjami ścisłych regulacji dotyczących współczesnej polityki fiskalnej. W związku z tym weryfikacji poddano hipotezę, zgodnie z którą stosowanie reguł w polityce

makroekonomicznej jest rozwiązaniem korzystniejszym niż uznaniowość. Hipoteza ta nie została jednoznacznie zweryfikowana. Stwierdzono wprawdzie, że zazwyczaj stosowanie reguł jest korzystniejsze z uwagi na większą wiarygodność dla rynku. Należy jednak dodać, że wiąże się ono z mniejszą elastycznością, co szczególnie niekorzystne okazać się może podczas kryzysu.

Introduction

Fiscal policy may be discretionary or based on rules. In the former case, decision-makers freely evaluate the current and predicted future economic situation. Based on that evaluation, they apply instruments being solely founded on their own opinions and decisions, guided by their own knowledge and conscience. For example, a national government can explain themselves to the public, without presenting relevant calculations, that they increased the budget deficit since it was required by *e.g.* a difficult economic situation.

An alternative to discretionary policy is policy based on rules. As for fiscal policy, such a rule can be, for instance, striving not to exceed the upper limits established by the budget deficit or public debt, or a certain limit on an annual rise in budget expenditures.

The aim of this article is to attempt to resolve dilemmas over the positive and negative consequences of strict regulations concerning contemporary fiscal policy. Therefore, a hypothesis will be initially examined wherein the application of rules in fiscal policy is a more advantageous solution than discretionary policy.

The study is theoretical in nature, although numerical data and examples of economic reality are provided in some cases. The article is composed of this introduction (Point 1), three main parts and a summary. The first main part (Point 2) presents examples of selected fiscal policy rules. The second main part (Point 3) shows the costs and benefits of applying rules and following discretionary policy. In the final part (Point 4), the application of both types of policy in the economic practice of EU countries in recent years is shown using specific examples. The article ends with a summary containing final conclusions.

Exemplary Fiscal Policy Rules

The simplest variant of fiscal policy rules are upper limits of public debt or budget deficit. They are often enshrined in treaties, constitutions or statutes. In such a case, various sanctions can be imposed if a set limit is exceeded. Typically, limits are not expressed in monetary terms but in the form of indices – usually as a percentage of GDP. It was in that way that reference values were

formulated for the EU countries in the Maastricht Treaty. They were set at the levels of 60% of GDP for public debt and 3% of GDP for budget deficit respectively (*Treaty on European Union* 1982, p. 27, 183).

The application of rules related to public finance in the entire community is connected with policy aimed at maintaining price stability in the euro zone. In order to implement the assumption of a strong common European currency, it is necessary to maintain economic balance in the member and candidate states of the Economic and Monetary Union. Therefore, certain conditions are imposed on the countries to be met even prior to joining the euro zone.

Along with the above-mentioned criteria officially enshrined in the law and concerning the two most common fiscal measures, *i.e.* debt and deficit, another category of fiscal rules is sometimes taken into account. Budget expenditures can also be regarded. The simplest version of such rules assumes that governments are obliged not to exceed an appropriate limit imposed on those expenditures with relation to GDP.

A typical spending rule may also presume that state expenditures can increase by not more than a certain marginal value. The value may be set, for example, at a level equal to the long-term rate of economic growth. According to a more complicated version of the rule, the rate of a rise in expenditures ought not to exceed a certain moving average of the future rates of an increase in revenues.

It is also worth mentioning the so called golden fiscal rule applied in some countries, where under current revenues can be used to cover not all but solely current expenditures. The other expenditures, *i.e.* those associated with investment, may generate a certain level of deficit (KELL 2001, p. 3).

It should be emphasised that fiscal policy rules may serve, among others, to evaluate how restrictive a policy is. The simplest way to examine that scenario is to compare the actual budget deficit and public debt ratios with provisions concerning reference values in the constitution, statutes or treaties. In such a case, rules play an important application role as the fact of adhering to or breaching the rules by a country can be a central argument, for instance, when qualifying for the euro zone.

Fiscal criteria established at the above-mentioned levels are justified by practice. Nevertheless, treating them as optimal fiscal policy rules attracts considerable criticism. This particularly concerns the public debt limit. There has been a discussion in the specialist literature on an optimal debt ratio level. The level may depend on many factors, for example: the relationship between growth and interest rates, demographic trends, the distortionary effects of different taxes, the degree of aversion to risk and inequality across generations, the type and extent of market failures, the degree to which consumers are forward-looking, the size and distribution of shocks, and whether government expenditure is either permanent or structural (KELL 2001, p. 14).

That issue aside, attention should be paid to the fact that such a rule can be appropriate only when the set debt limit equals approximately the initial debt-GDP ratio. Otherwise, when the initially established debt limit is significantly higher than the current one, fiscal policy may tend to be excessively expansionary due to the fact that, despite the increasing indebtedness, the debt limit still seems to be relatively "safe" (DZIAŁO 2009, p. 184).

In such a case, a better rule appears to be, for instance, the requirement to reduce or stabilise the debt ratio to or at the level of the base year. The budget balance should then be set at a level preventing relative public indebtedness (as a proportion of GDP) from growing (KOPITS 2001, p. 10).

In that context, it is worth directing attention to the fact that all of the above-mentioned rules may be unsuitable for countries not regarded as developed ones since they are not sufficiently saturated with infrastructure yet (KOPITS 2001, p. 23). The high investment needs of such countries may require the so called modified golden rule according to which budget deficit should be maintained at such a level so that the ratio of net public assets to GDP remains unchanged. In other words, a rise in relative public debt may be allowable in such cases, although it ought not to exceed an increase in the public-capital-to-GDP ratio (MACKIEWICZ 2006, p. 55, 58).

It may also turn out to be very useful in analysing fiscal policy, the isolation of the total budget balance from the cyclical (connected with output gap) and structural portions. The latter should be regarded as an approximate figure that enables determining the budget balance value if the economy works at full capacity. Moreover, the division of the budget balance into the two portions allows distinguishing between discretionary actions and automatic stabilisers as the former mainly affect the structural portion, while the latter – the cyclical portion of the budget balance (TAYLOR 2000, p. 31).

Taking into account the division of the budget balance into two components, a fiscal rule can be assumed that, for instance, requires solely the structural budget rather than the total budget to be balanced. Alternatively for some countries, the rule can presume not a zero, but a relatively low, structural deficit. It is in that way that the medium-term fiscal policy target is set in convergence programmes recommended by the European Commission for particular countries[1].

Yet another rule may be associated with isolating, from the total budget balance, the primary balance. The primary balance is calculated as a difference

[1] For instance, for the Visegrad Group countries, the target was established at the level of: 0.5% of GDP for Slovakia, 1.0% of GDP for Poland and the Czech Republic, 1.7% of GDP for Hungary (*Convergence Programme of the Czech Republic*, 2015, p. 2; *Convergence Programme of Hungary 2014–2017,* 2014, p. 31; *Convergence Programme. 2014 update*, 2014, p. 8; *Stability Programme of the Slovak Republic for 2014–2017,* 2014, p. 23).

between budget revenues and expenditures minus interest payments on public debt. Then, the rule can provide for the requirement of the balanced primary budget, for example.

It is worth highlighting that such a rule would, to some extent, be contrary to the relative debt stability rule, since the primary balance values safe for maintaining the public debt ratio stability vary considerably among countries. In order to stabilise the debt-GDP ratio in some countries, a primary budget surplus proportionate to the difference between the interest rate and nominal GDP growth rate would be necessary. If, however, the latter rate is higher, the debt ratio can be stabilised even at a certain level of primary deficit[2]. In such a case, the fiscal policy rule enables controlling the effects of interest rates and the GDP growth rate changing over time on the deficit component connected with public debt servicing (FAVERO, MONACELLI 2005, p. 3).

It should be emphasised that fiscal policy rules are mostly target rules. Although maintaining appropriate structural or primary balances can be considered an instrument of maintaining *e.g.* unchanged relative debt, it would be more accurate to regard those as targets as well (indirect and at the same time essential for meeting the main objective). If we assume fiscal policy instruments to be mostly expenditures and taxes, an instrument-related rule should be considered, in principle, to concern solely the limits on the level of or changes in expenditures (absolute or relative). On the other hand, expenditure rules can also be categorised as target rules, given their common main task of helping to maintain appropriate deficit and debt levels. Therefore, the boundary between target rules and instrument rules is sometimes quite fluid.

Costs and Benefits of Rule-Based and Discretionary Fiscal Policy

An attempt at verifying the hypothesis put forward in the introduction, whether discretionary or rule-based policy is more beneficial for the economy, can be made on the basis of several criteria. Those include, among others: **credibility** and **flexibility**, which are shown in Table 1. Furthermore, in the case of the former, attention will be devoted to two aspects associated with it: **market uncertainty** and the **temptation of abuse**.

[2] Applying values in real terms, the debt ratio can be stabilised even at a certain level of primary deficit if the economic growth rate (real GDP) exceeds the difference between the nominal interest rate and inflation rate.

Table 1

Rule-based versus Discretionary Fiscal Policy

Characteristic	Discretionary Fiscal Policy	Rule-based Fiscal Policy
(1) Credibility	lower	higher
– Market uncertainty	higher	lower
– Temptation of abuse	higher	lower
(2) Flexibility	higher	lower

Source: own work.

Credibility of Fiscal Policy

The presence of rules enhances the accountability of decision-makers since, if rules are violated, they owe an explanation of the causes of such an action to public opinion. Moreover, consistent adherence to policy rules increases its **credibility**, and hence will usually improve its effectiveness as well.

It is the presence of invariably obeyed rules in the consciousness of market participants that allows them to predict future macroeconomic policy decisions, eliminating, to a certain extent, the negative consequences of **market uncertainty**. Discretionary policy, in turn, increases that uncertainty.

Credibility is strictly connected with the issue of **temptation of abuse** as the absence of clear rules increases the decision-makers' tendency to make decisions more advantageous to themselves but often less than optimal for the economy in the long run, particularly taking into account the unrepresentativeness of public officials in conjunction with relatively short election cycles. At that point, attention should be directed to the fact that a rise in deficit may be advantageous to authorities from the point of view of future parliamentary elections. Even when the likelihood of election defeat and loss of power is high, it may also be more advantageous for the government to increase the deficit as the costs of that excessive deficit will be borne by the next government – who will be forced to limit expenditures during the next term. Thus, in that model, the higher the risk of loss of power by the ruling party and the higher the political polarisation is, the higher the budget deficit becomes (ALESINA, TABELLINI 1990, p. 22).

On the grounds of a balanced budgetary position over the entire economic cycle rather than in a given fiscal year, it is sometimes called for in the economic literature (KELL 2001, p. 3) that fiscal policy ought to be countercyclical. This means that when the economy is doing well, the government should reduce expenditures as a result of higher revenues from taxes and lower welfare expenditures connected with unemployment benefits, for example. However, remarkably often it appears that due to, among others, the prefer-

ences of voters who decide the outcome of elections, fiscal policy is pro-cyclical, which means that government expenditures grow even in an economic boom (ALESINA, TABELLINI 1990, p. 23–24).

Flexibility of Fiscal Policy

Despite many possible adverse consequences of increasing deficit and debt for economic growth in the case of discretionary policy, it should be kept in mind that discretionary policy can be more beneficial for the economy in some circumstances. Sometimes governments may face various, often quite dramatic situations such as wars, surges in oil prices or deep stock-market slumps. In such exceptional situations, rules would not be capable of taking into account those extraordinary circumstances. Then the freedom of action by fiscal authorities could prove a valuable asset (MANKIW, TAYLOR 2009, p. 455). Thus, in economic crisis conditions many countries pursue expansionary fiscal policy, which is meant to boost the economy and bring about multiplier effects in global demand.

Strict adherence to rules could blunt such effects, hence also contributing to long-term negative consequences in the labour market since, according to the neo-Keynesian view, along with short-term actual unemployment increases, crises may also lead to a long-term rise in natural unemployment. This results from, among others, the hysteresis concept according to which, if the actual unemployment rate is higher than the natural rate of the previous period, the latter will automatically rise as a consequence. What is more, the increase is not a one-off but is rather long-term in nature. That means that the labour market situation deteriorating due to a recession leaves a permanent "scar" behind and thus, even after negative shocks stop affecting the economy, the natural rate will not return to its previous lower level (BALL, MANKIW 2002, p. 9).

Therefore, it can be concluded that **flexibility** is decidedly a stronger point of discretionary policy. All the more so as fiscal target rules may sometimes contribute to very nervous actions of decision-makers determined not to exceed upper deficit or debt levels, not infrequently even resorting to creative accounting practices (KOPITS 2001, p. 7). Thus, it is worth drawing attention in that context to the fact that, if rules already apply, their essential characteristic should be transparency in governmental operations, including accounting, forecasting and institutional arrangements (KOPITS, SYMANSKY 1998, p. 18).

On the other hand, it ought to be highlighted that the abandonment of already applicable rules (through, for example, exceeding an upper debt ratio limit) could lead to even worse consequences for the economy associated with

the total loss of the credibility of authorities. However, that in fact depends, among others, on possible external sanctions for the breach.

Discretionary versus Ruled-Based Fiscal Policy in the EU Countries' Economic Practice

Many fiscal rules described in Point 1 can be applied in particular EU countries on a certain voluntary basis. That means that, although they are recommended by the European Commission (*e.g.* the rule regarding the achievement of an appropriate structural deficit level), they act as a medium-term target with no practical consequences of noncompliance. Even more freedom of application concerns such rules as: not increasing the debt ratio (when the reference value has not yet been exceeded), limits on primary deficit or increases in governmental expenditures, as well as different variants of the golden fiscal rule. In the above cases, a decision to apply or not to apply a given rule is usually made by governments of sovereign countries rather than by EU authorities.

A slightly different approach characterises the issue of reference values of public debt and total budget deficit as all the EU member states are obliged to respect them pursuant to the Maastricht Treaty. What is more, a fine of up to 0.1% of GDP may be imposed on countries failing to follow those rules (*Information Note on the EU Fiscal Compact Treaty* 2012, p. 11). Such an approach would be consistent with the view promoted by Taylor, among others. According to him, even in economic crisis conditions, government interventions involving fiscal laxity could do more harm than good, resulting in deviations from what has worked well before, without a significant boost to GDP. In such a case, due to the adverse long-term consequences of deficit and debt, the government should always, irrespective of the condition of the economy, strive to reduce indebtedness, especially if the target rule in the form of a set convergence criterion has been exceeded or is close to being exceeded (TAYLOR 2010, p. 175).

Interestingly in that context, against commonly held opinions, governments which pursue fiscal tightening often win the next election. According to research carried out by A. Alesina and S. Ardagna, out of nine analysed countries which implemented restrictive fiscal policy programmes in the 1980s and 1990s, election defeat after fiscal tightening occurred only in Greece and Denmark as well as in Ireland during the first analysed period. This was not the case in: Australia, Belgium, Canada, Italy, the Netherlands and Sweden as well, although only in the second analysed period, in Ireland (ALESINA, ARDAGNA 1998, p. 32–57).

On the other hand, it ought to be remembered that inflexible adherence to rules may sometimes result in undesirable nervous actions on the part of authorities. That is exemplified by actions of the Greek government before their accession to the euro zone, which understated the official debt statistics as compared to the actual debt and, recently, the reaction of the Polish government to the risk of exceeding the constitutional and treaty threshold of 60% public debt. When public debt reached 57% of GDP, it was decided to transfer money from Open Pension Funds to the budget (*Convergence Report* 2014, p. 163–165).

Nevertheless, decision-makers do not take such nervous steps very often, permitting the exceeding of allowable limits. Figure 1 indicates that as many as 17 EU-28 countries (Greece, Italy, Portugal, Cyprus, Ireland, Belgium, Spain, France, the United Kingdom, Croatia, Austria, Slovenia, Hungary, Germany, Malta, the Netherlands and Finland) exceeded the public debt ratio convergence criterion in 2015. For comparison, that was the case for only 9 EU-28 countries (Greece, Italy, Portugal, Belgium, France, Austria, Hungary, Germany and Malta) in 2008. That means that 8 countries (Cyprus, Ireland, Spain, the United Kingdom, Croatia, Slovenia, the Netherlands and Finland) exceeded the required level in recent years. What is more, Figure 1 indicates that 9 countries, which exceeded the 60% level as early as in 2008, not only did not near the required reference value but got even further away from it, regularly increasing their debt ratios over the last seven years. That is not changed by the fact that, over the last three years (from 2012 to 2015), 10 EU-28 countries (the Czech Republic, Denmark, Germany, Ireland, Lithuania, Luxembourg, Hungary, Malta, the Netherlands and Poland) managed to reverse the negative trend by slightly reducing their public debt ratios (http://epp.eurostat.ec.europa.eu – Code: tsdde410) – accessed on 31 May 2016).

Similar conclusions can be drawn based on the analysis of the budget deficit ratio. Figure 2 indicates that the 2009–2011 budget balance deteriorated compared to the preceding three-year period in all countries except Hungary. Some of them managed to improve the said balance in the following three years but it usually remained worse than in the 2006–2008 period. Therefore, considering the average three-year values, the deficit level required by the Maastricht Treaty was exceeded in as many as 21 countries (all apart from Denmark, Germany, Estonia, Luxembourg, Malta, Finland and Sweden) in the years 2009–2011 and 12 countries (Belgium, Ireland, Greece, Spain, France, Croatia, Cyprus, Poland, Slovenia, Slovakia and the United Kingdom) in the years 2012–2014. For comparison, that convergence criterion was not met by only 5 countries (Greece, Hungary, Portugal, Romania and the UK) in the 2006–2008 period.

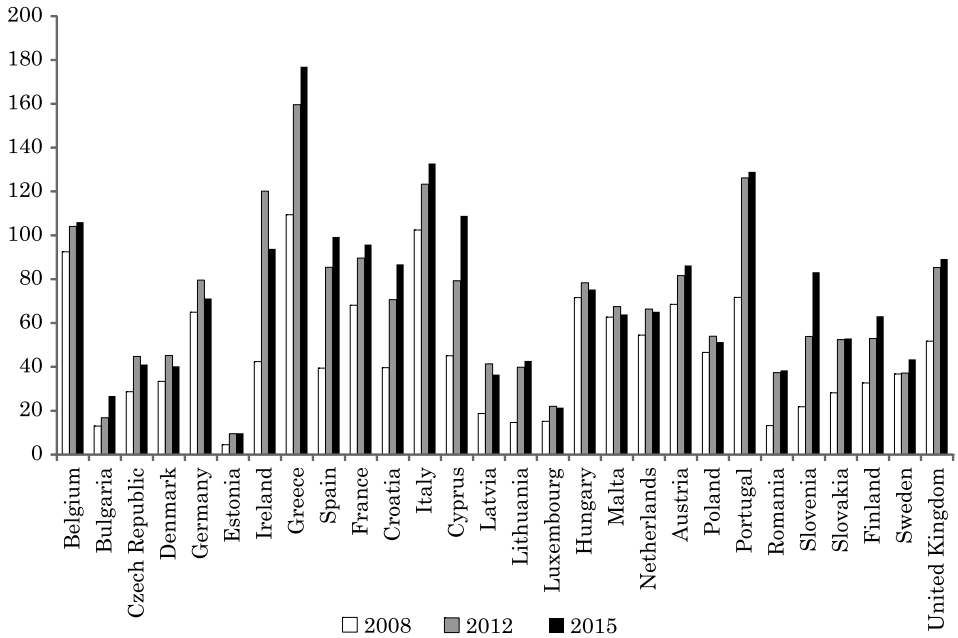

Fig. 1. Public debt ratios in EU countries in 2008, 2012 and 2015
Source: http://epp.eurostat.ec.europa.eu (Code: tsdde410) – access: 31.05.2016.

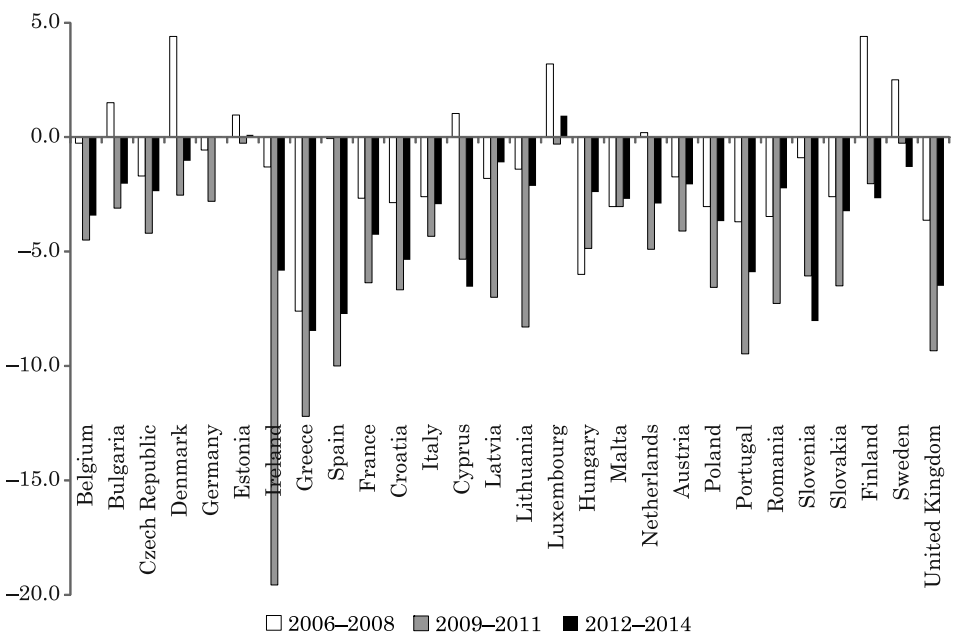

Fig. 2. Average budget balance ratios in EU countries in the years 2006–2008, 2009–2011 and 2012–2014
Source: http://epp.eurostat.ec.europa.eu (Code: tec00127) – access: 31.05.2016.

Taking into account the fact that the economic crisis widely manifested itself in 2009, the growing debt and deficit may indicate that in order to stimulate global demand, particular countries' governments applied very expansionary fiscal policy, ignoring the applicable Maastricht Treaty provisions.

In that context, it can be assumed that the model actually applicable in the EU is to a large degree a compromise solution and exceeding the prescribed limits does not usually entail any sanctions in practice, apart from possibly not being qualified to join the euro zone. Moreover, the Stability and Growth Pact contains a provision stating that the European Commission may not even instigate disciplinary procedures at all, if it decides that rules have been violated due to an extraordinary, transient situation (DZIAŁO 2009, p. 117). On the one hand, such an approach significantly reduces the long-term benefits of applying and obeying the rules. On the other hand, as presented in the theoretical analysis, it increases the flexibility of fiscal policy sometimes needed in the economy in the recession phases of an economic cycle.

Conclusion

The conducted analysis allows the drawing of several fundamental conclusions.

1. National governments face a dilemma about whether to follow a fully discretionary fiscal policy or a fiscal policy based on certain rules. Fiscal rules are, first and foremost, target rules. They mostly concern limits of maintaining public debt and budget deficit at appropriate levels in relation to GDP. They are enshrined in the law and their violation may sometimes entail sanctions. Furthermore, there may be more such rules as they may also apply to budget expenditures, structural deficit and primary deficit.

2. If rules apply, fiscal policy is more credible (apart from the nervous actions of authorities when a variable approaches the maximum allowable level). All the more so as the presence of rules is connected with lower market uncertainty and lower temptation of abuse. On the other hand, rule-based policy is decidedly less flexible, especially in extraordinary situations such as wars, stock-market crashes or economic crises.

3. Therefore, **the hypothesis put forward at the beginning cannot be unambiguously proved or rejected.** Nevertheless, based solely on the conducted theoretical analysis, a statement can be attempted that rules are more advantageous in normal conditions, whereas in exceptional situations discretionary policy can be better for the economy thanks to its higher flexibility. The lack of sanctions against countries not adhering to rules in the EU seems to prove that similar conclusions have also been drawn by EU

decision-makers. It should, however, be emphasised that the above hypothesis cannot be fully verified based on the mainly theoretical deliberations and thus the analysed issue requires detailed empirical studies for particular regions or countries.

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ASSESSING THE EFFICIENCY OF INVESTMENT FUND MANAGEMENT USING QUANTILE RISK MEASURES

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Key words: mutual fund, management efficiency, value-at-risk, conditional value-at-risk, APARCH model.

Abstract

The aim of the research is to compare the efficiency of managing selected Polish investment funds in various phases of stock market condition. The Value at Risk (VaR) and Conditional Value at Risk (CVaR) is used to construct efficiency ratios of fund management. Those funds investing in financial instruments have the most stable expected rate of return and the lowest risk, in all the analysed periods which made them highly effective.

The article also discusses the alternative methods to VaR and CVaR estimation which are used in the study. It is noted VaR and CVaR estimates obtained using backtesting and using APARCH models give similar results.

OCENY EFEKTYWNOŚCI ZARZĄDZANIA FUNDUSZAMI INWESTYCYJNYMI PRZY WYKORZYSTANIU KWANTYLOWYCH MIAR RYZYKA

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Słowa kluczowe: fundusz inwestycyjny, efektywność zarządzania funduszem, wartość zagrożona, warunkowa wartość zagrożona, model APARCH.

Abstrakt

Celem badań było porównanie skuteczności zarządzania wybranymi polskimi funduszami inwestycyjnymi w różnych fazach koniunkturalnych na rynku papierów wartościowych. Wartość zagrożona i warunkowa wartość zagrożona zostały wykorzystane do konstruowania wskaźników efektywności zarządzania funduszami. Fundusze inwestujące w instrumenty finansowe charakteryzowały się najbardziej stabilną oczekiwaną stopą zwrotu i najmniejszym ryzykiem we wszystkich analizowanych okresach, co przełożyło się na wysoką efektywność zarządzania tymi funduszami. Ponadto, w artykule zostały wykorzystane alternatywne metody estymacji VaR i CVaR. Zauważono, że zarówno dla VaR i CVaR oszacowanych metodą danych historycznych, jak i przy wykorzystaniu modeli APARCH, uzyskano podobne wyniki.

Introduction

Quantile measures of risk, like Value at Risk (*VaR*) are one of the widely-used risk measures due to the recommendation of the Basel Committee on Banking Supervision. This measure is also used in evaluating investment risk on the stock exchange. Quantile measures are used to analyse risk in emerging markets; the results of the research can be found in the paper of ATILGAN and DEMIRTAS (2013). Moreover, these measures function as the criterion of optimisation when choosing a securities portfolio (MAGHYEREH, AWARTANI 2012). Quantile measures are also used to assess investment risk on the commodity market (HAMMOUDEH et al. 2013). Also, relatively recently there were trials to use quantile measures to estimate risk at value of conditional volatility models. According to the authors of this approach, such models, despite their significant complexity, estimate *VaR* more precisely than the classic methods (e.g. GIOT, LAURENT 2003, ANGELIDIS et al. 2004, SO, YU 2006).

In order to judge the efficiency of managing investment funds a modified Campbell measure of efficiency is used (CAMPBELL et al. 2001). Efficiency ratios of investment portfolio management are used to compare investment portfolios with regard to profitability and risk. These measures evaluate a particular investment portfolio in term of expected profit and the degree of risk-free investments as well as the general situation in the market. A classic efficiency ratio of portfolio management is the Sharpe ratio, in which the excess of realised rate of return over the risk-free rate is referred to the risk measured with standard deviation (SHARPE 1966). Other popular efficiency ratios are based on the systematic risk of Jensen's Alpha (JENSEN 1968), Treynor's ratio (TREYNOR 1965) or M2 (MODIGLIANI 1997). In the case of the Polish capital market, an interesting analysis of the management effectiveness of the funds can be found in PIETRZYK'S article (2014). In his work 12 mutual fund were analysed. The topic of this research was market timing and the stock selection abilities of fund managers. A comprehensive analysis of the effectiveness of

investment fund management, yet excluding quantile measures, can be found in the work of ZAMOJSKA (2012).

The research aims to outline changes in the return of sales, risk and the management efficiency of particular fund types, depending on the situation in the financial markets. Further, various results obtained with different methods of *VaR* estimation were compared. The basic division of estimation methods came down to the use of backtesting and a method based on APARCH type of conditional volatility models. In the method of backtesting it is assumed that each observation has the same probability.

The aim of the research is to compare quantile risk and the efficiency of managing selected investment funds in various phases of stock market condition. It may be assumed that in a period of growth, aggressive funds are best-managed, whereas in a period of decline cash and bond funds are better.

Selected concepts of *VaR* and *CVaR*

Quantile measures can be estimated on the basis of the distribution function of certain theoretical distributions which are usually assumed as normal distributions. Other estimation methods are based on the method of backtesting, where the model of distribution is not taken into account. It is assumed that each observation in the past occurs with the same probability

In the classical approach, the value at risk (*VaR*) is understood as such a loss of market value of financial instrument that the probability of its occurrence, or exceeding in a planned period, equals the desired, close to zero tolerance level of h:

$$P(P_t \leq P_{t-1} - VaR) = \alpha, \tag{1}$$

where:
P_t – refers to instrument price in a moment t.

VaR may refer not only to the valuation level of a financial instrument in a given moment t, but also to the rate of return obtained in period t. Calculations in this article were carried out for rates of return, therefore, R_t denotes rate of return on a financial instrument. This rate can be treated as random variable, then *VaR* is α-quantile of its distribution, which is presented in the following equation:

$$P(R_t \leq - VaR) = \alpha. \tag{2}$$

Usually the left tail of distribution of return rates is analysed, assuming the probability on the level not higher than 0.1. As rates of return on financial instruments take on negative values in the bottom quantile, minus in the equation above means that estimation of VaR is usually obtained as positive value.

Another risk measure originating from *VaR* is Conditional Value at Risk (*CVaR*), which is defined as conditional expected value of return rates on a financial instrument provided that the rate of return takes on values lower than α-quantile. *CVaR*, corresponds with the medium level of loss, if the level of loss exceeds *VaR*, it can be written as:

$$CVar = E\{R_r \mid R_t \leq -Var(\alpha,R_t)\}, \tag{3}$$

where:
$Var(\alpha,R_t)$ – denotes value at risk for rate of return R_t and tolerance level α.

However, "classic" value at risk, as defined within equation (1) and (2) is not without faults. The most important fault involves the lack of fulfilling the condition of subadditivity, which means that *VaR* is not a coherent measure in the perspective of ARTZNER et al. (1999). In empirical studies (ROCKAFELLAR, URYASEV 2002) other faults of this risk measure were also pointed out. Conditional value at risk (*CVaR*) meets the condition of coherence and, therefore, in application (for instance, in portfolio analysis) this measure is more attractive than classic *VaR* (e.g. ROCKAFELLAR, URYASEV 2000, QUARANTA, ZAFFARONI 2008, LIM et al. 2011).

To estimate *VaR* calculations of conditional volatility were obtained with the use of conditional volatility models. This approach allows the inclusion of asymmetry in the conditional distributions of rates of return. As discussed above, this is to assure greater precision of *VaR* estimations. In this case, to determine the risk measure, estimations of volatility from the model and quantiles of adjusted distributions of innovation are used. Value at risk in period t is then estimated on the basis of conditional distributions of rates of return if provided with information available until moment $t - 1$, and is defined as:

$$P(R_t \leq -Var_t(\alpha,R_t) \mid \Omega_{t-1}) = \alpha, \tag{4}$$

where:
Ω_{t-1} – stands for the whole information available which determines the rate of return. In this article, to estimate *VaR* a model from the group of generalised models of autoregressive conditional heteroskedasticity APARCH (1, 1) (DING, GRANGER, ENGLE 1993) with the following specification:

$$Y_t = \sigma_t \varepsilon_t$$
$$\sigma_t^{\delta} = \varpi + \theta(|Y_{t-1}| - \gamma Y_{t-1})^{\delta} + \beta \sigma_{t-1}^{\delta}, \tag{5}$$

where:
$\delta > 0$, $-1 < \gamma < 1$, ϖ, θ, β – are model parameters.

In the aforementioned equations

$$Y_t = R_t - E(R_t \mid \Omega_{t-1}), \tag{6}$$

where:
$E(R_t \mid \Omega_{t-1})$ – is estimated with the use of models ARMA(n,m), represented as

$$E(R_t \mid \Omega_{t-1}) = \varphi + \sum_{i=1}^{n} \varphi_i R_{t-1} + \sum_{j=1}^{m} \eta_j Y_{t-j}, \tag{7}$$

and variables Y_t are IID with mean 0. Such action is justified as all analysed time series were stationary in the sense of standard ADF test of unit root occurrence. Symbol σ_t which occurs in equation (5) refers to conditional standard deviation, and ε_t is a sequence of independent variables with the same distribution of mean 0 and variance 1. In the case where the model parameters recognize certain specific values, the APARCH model (5) is reduced to one of the seven simple conditional variance models (see DING, GRANGER, ENGLE 1993). In the present, research it is assumed that ε_t can have normal distribution, Student's-t distribution or skew Student's-t distribution. On the basis of estimations from model (5) and (7), VaR forecast is estimated using the following formula:

$$VaR(\alpha,R_t) = -\mu_{t|t-1} - \sigma_{t|t-1} \cdot F_{\varepsilon}^{-1}(\alpha), \tag{8}$$

where:
$F_{\varepsilon}^{-1}(\alpha)$ – stands for α-quantile from a probability distribution of ε_t variable, whereas $\mu_{t|t-1}$ and $\sigma_{t|t-1}$ mean one-period forecasts of conditional expected value and volatility respectively.

To distinguish from risk measures represented by formula (2) and (3), quantile risk measures estimated on the basis of models of conditional volatility (5) and conditional expected value (7) are marked as $VaR_{\alpha}|\Omega_{t-1}$ and $CVaR_{\alpha}|\Omega_{t-1}$.

Campbell measure of risk and efficiency

A classic measure of portfolio management efficiency is the Sharpe ratio. It constitutes a premium for risk per unit of total risk, expressed with standard deviation:

$$Sh_S(p) = \frac{R_t(p) - R_f}{s_p}, \tag{9}$$

where:
$Sh_S(p)$ – the Sharpe ratio for portfolio p, R_t (p) – mean rate of return for portfolio p, R_f – mean risk-free rate of return, s_p – standard deviation of rate of return for portfolio p. The higher the value of this ratio, the better a particular investment fund is managed. Generally, the value of the Sharpe ratio for a particular investment portfolio is compared with the value of this ratio as a market index. If the value of the Sharpe ratio is higher than the value of the market index, it suggests that the fund is being managed efficiently.

Sortino modified the Sharpe ratio by replacing standard deviation with semi-deviation (SORTINO, SATCHEL 2001, p. 63). In a similar way, by using downside risk measures, one may modify other efficiency ratios for managing investment portfolio and obtain their downside counterparts (MISHRA, RAHMAN 2001, BACON 2008, p. 95–103).

CAMPBELL et al. (2001) in their study suggested VaR-based risk measure of portfolio investment. $W(0)$ stands for investment value in the initial moment of time and $VaR(\alpha,R_p)$ denotes VaR for rate of return on portfolio p. In the study, risk measure is used as:

$$\varphi(\alpha,p) = W(0) \cdot R_f - W(0) \cdot VaR(\alpha,R_p) \tag{10}$$

where:
R_f refers to risk-free rate available on the market. Bearing in mind the result obtained in (10), a counterpart of the Sharpe ratio is constructed:

$$Sh_\varphi(p) = \frac{R_t(p) - R_f}{\varphi(\alpha,p)}, \tag{11}$$

where:
R_t(p) – is the expected rate of return on investment in portfolio p (in the article, fund is identified with portfolio) in a moment of time t. Formula (11) informs of the expected profit from investment over the risk-free rate with regard to the

risk involved. As observed by CAMPBELL et al. (2001), in constructing the optimal portfolio maximizing ratio (11), the size of the initial capital does not have any impact on the choice of the optimal portfolio and, consequently, it does not influence evaluation of portfolio management efficiency performed with ratio (11). Therefore, in this article, a slightly simpler risk measure is proposed:

$$\varphi(\alpha,p) = R_f - VaR(\alpha,R_p), \tag{12}$$

with the same markings. Formula (12) was placed in formula (11) as denominator. Moreover, in this research, while estimating downside portfolio management efficiency ratios, *VaR* as well as *CVaR* were used in analogy to equation (12).

Empirical research

The quantile risk measures discussed in the article are estimated for fifteen selected investment funds managed by three investment fund companies operating in Poland. These funds have a varied declared levels of risk, and, as a result, a different structure of assets. Among them, are distinguish stock funds locating capital in the stocks of companies listed on foreign stock markets, including the Russian stock market; balanced funds, and also funds of financial instruments (including cash) and debt securities, which are commonly perceived as safe. Three of the most popular investment fund management companies in Poland are taken into account. The second criterion for selection is that the selected fund management companies administrated all types of investment funds. Instead of the original names of the funds we use a brief description of the funds. The full names of the funds are provided in Appendix 1. Simple daily returns were used and some statistics relating to them are provided in Appendix 1. To compute the statistics and results the authors used OxMetrixc 5 software.

To identify particular phases of the business cycle four market indices were taken into consideration: WIG, DAX, RTS, and NASDAQ. It should be stressed that two of them concern developed markets and the other two refer to emerging markets. The identification of certain phases has an arbitrary character and is carried out on the basis of ananalysis of the diagrams modeling the aforementioned indices. It is assumed that if the change of a trend is observed before it occurs in at least three diagrams, then the moment of its occurrence is accepted as the end of the observed phase of business cycle.

The study is conducted in various phases of the business cycle on financial markets. While analysing the time series of values of particular indices, four sub-periods are identified:

– I period (02.01.2006 – 28.12.2007) is the phase of strong growth in all analysed stock markets;

– II period (02.01.2008 – 27.02.2009) brought a crash in financial markets, which involved significant losses of value in the analysed indices;

– III period (02.03.2009 -10.08.2011) is the period of growing prices on all analysed financial markets;

– IV period (11.08.2011 – 25.03.2014) is another period of growth after a sudden and short-term collapse of prices in the financial markets. In this period, index values of WIG, DAX and NASDAQ were higher whereas RTS index had a slight risk-off trend. Characteristic for this sub-period was stagnation in the Russian financial market with concurrent growths on the Warsaw Stock Exchange, Frankfurt Stock Exchange and growing prices on over-the-counter stock exchange markets in the USA, Canada and Japan.

In the article, index POLONIA was assumed as the risk-free rate.

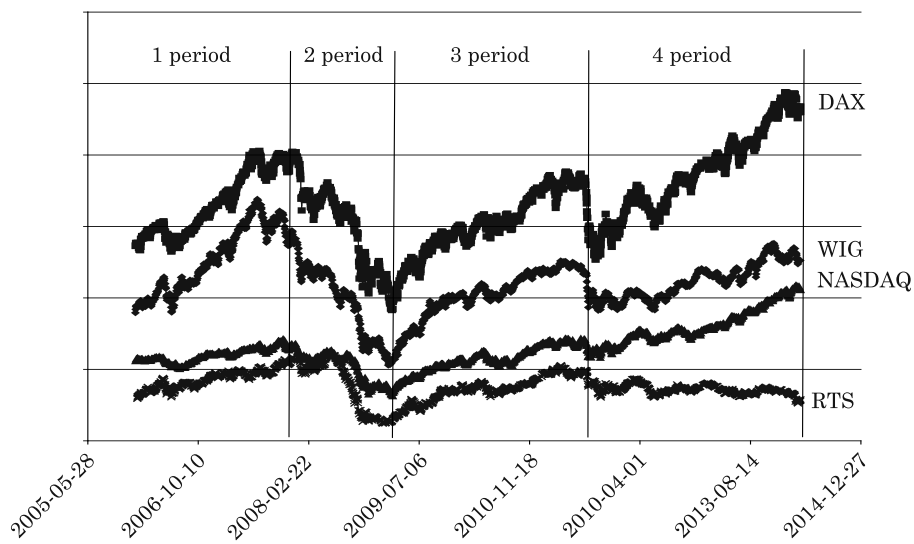

Fig. 1. Diagrams of indices and identified business cycle phases
Source: authors own elaboration.

In the study, there were problems connected with using APARCH models. In most cases, the model APARCH is reduced to GARCH. In addition, it is examined whether the use of the models IGARCH (ENGLE and BOLLERSLEV (1986)), EGARCH (BOLLERSLEV and MIKKELSEN (1996)) or GJR (GLOSTEN, JAGANNATHAN, RUNKLE (1993)) gives better results compared to the GARCH

model. All models are estimated three times, under different assumptions regarding the random component that is normal, *t*-student and skewed *t*-student. The final model to estimate VaR was chosen as the best model, meeting the assumptions of stationarity conditional variance and conditional average. However, it is impossible to estimate the parameters of any APARCH – GARCH models for some of the analysed funds (Appendix 2 summarises the best models used in the study). In the first analysed period (the phase of strong growth), risk based on the models of conditional volatility could not be estimated for 6 funds. The problems are numerical in nature and concerned funds with low declared level of risk (cash, bond, debt securities) as well as those with low quantile risk measured with *VaR* and *CVaR* estimated on the basis of backtesting, where we assume that each observation has the same probability. For each of the sub-periods, quantile risk measures presented above were estimated.

Further, efficiency ratios of fund management are calculated. Tables 1–4 present values of estimated risk measures, expected rate of return and estimated efficiency using ratio (12). All rates of return shown in the Tables are annualised rates of return on investments in a particular fund, calculated on the basis of daily values of rates of return.

In all the analysed periods, cash funds were characterised by the highest efficiency. In the periods of growth and stabilization, the most profitable were stock funds whereas in the period of decline, cash funds and debt securities, which is in accordance with expectations regarding investment funds.

In the period of a bull market, only one fund had negative efficiency, i.e. *PZU Papierów Dłuż. POLONEZ (PZU Government Bond)*. Its mean profitability is lower than the mean risk-free rate of return. It is surprising that in the period of strong price growth on financial markets, the highest efficiency characterised in cash and money funds which were also the least profitable. Nonetheless, they were very safe due to the fact that in at least 95% of cases their rates of return are positive.

The expected rate of return on stock funds is several times higher than the rate expected for cash funds. However, the risk associated with stock funds is also very high. The low values of efficiency ratio for stock funds indicate that the obtained rate of return is not sufficiently high for such a high level of risk.

In I period, due to numerical problems, it is impossible to estimate risk measures for APARCH conditional models of volatility. It is concerned with money funds and debt securities. It can be observed that in nearly all cases, estimations of *VaR* obtained with backtesting are lower than estimations obtained with APARCH models. As for *CVaR* estimations, the tendency is reversed, which is reflected in higher efficiency of *VaR* estimated with backtesting as compared with estimations from APARCH models. Efficiency estimations for *CVaR* are higher for models of conditional volatility.

Table 1
Fund risk and measures of management efficiency for $\alpha = 0.05$, 02.01.2006 – 28.12.2007 – bull market

Society/Investment fund	$E(R_p)$	VaR ($Sh_{VaR}(p)$*)	$VaR \mid \Omega_{t-1}$ ($Sh_{VaR}(p)$*)	$CVaR$ ($Sh_{CVaR}(p)$*)	$CVaR \mid \Omega_{t-1}$ ($Sh_{CVaR}(p)$*)
PZU Polish Equity	0.4356	0.9972 (0.0544)	0.9983 (0.0502)	0.9999 (0.0340)	0.9999 (0.0361)
PZU Government Bond	0.0379	0.3598 (-0.0084)	–	0.4672 (-0.0061)	–
PZU Money Market Fund	0.0574	0.0000 (0.3512)	–	0.1055 (0.0949)	–
PZU Stable Growth	0.1636	0.9192 (0.0433)	0.8985 (0.0475)	0.9785 (0.0285)	0.9738 (0.0301)
PZU Eastern European Equity	0.2066	0.9991 (0.0209)	0.9992 (0.0207)	0.9999 (0.0136)	0.9999 (0.0146)
Amplico Polish Equity	0.4743	0.9984 (0.0539)	0.9993 (0.0482)	0.9999 (0.0347)	0.9999 (0.0376)
Amplico Government Bond	0.0692	0.4370 (0.0417)	–	0.5121 (0.0338)	–
Amplico Money Market Fund	0.0559	0.0000 (0.3157)	–	0.2896 (0.0340)	–
Amplico Stable Growth	0.1526	0.9155 (0.0402)	0.9493 (0.0335)	0.9805 (0.0255)	0.9754 (0.0270)
Amplico Eastern European Equity	0.1766	0.9642 (0.0362)	0.9827 (0.0298)	0.9956 (0.0224)	0.9927 (0.0246)
Arka Polish Equity	0.5192	0.9994 (0.0515)	0.9984 (0.0585)	0.9999 (0.0340)	0.9999 (0.0361)
Arka Government Bond	0.0739	0.4376 (0.0486)	–	0.6532 (0.0273)	–
Arka Money Market Fund	0.0562	0.0000 (0.3235)	–	0.1782 (0.0563)	–
Arka Stable Growth	0.2138	0.9317 (0.0561)	0.8990 (0.0655)	0.9844 (0.0365)	0.9785 (0.0395)
Arka Eastern European Equity	0.3253	0.9983 (0.0378)	0.9990 (0.0350)	0.9999 (0.0216)	0.9999 (0.0210)

* Information in brackets reflects the modified Campbell measure of management efficiency
Source: authors own calculation.

Table 2
Fund risk and measures of management efficiency for $\alpha = 0.05$, 02.01.2008 – 27.02.2009 – bull market

Society/Investment fund	$E(R_p)$	VaR ($Sh_{VaR}(p)$*)	$VaR \mid \Omega_{t-1}$ ($Sh_{VaR}(p)$*)	$CVaR$ ($Sh_{CVaR}(p)$*)	$CVaR \mid \Omega_{t-1}$ ($Sh_{CVaR}(p)$*)
PZU Polish Equity	-0.6434	0.9999 (-0.0010)	0.9999 (-0.0799)	0.9999 (-0.0683)	0.9999 (-0.0780)
PZU Government Bond	0.0777	0.7072 (0.0002)	–	0.8873 (0.0095)	–
PZU Money Market Fund	0.0658	0.2902 (0.0003)	–	0.6853 (0.0082)	–
PZU Stable Growth	-0.2429	0.9797 (-0.0008)	0.9928 (-0.0670)	0.9965 (-0.0586)	0.9928 (-0.0671)
PZU Eastern European Equity	-0.5782	0.9999 (-0.0005)	0.9999 (-0.0609)	0.9999 (-0.0389)	0.9999 (-0.0454)
Amplico Polish Equity	-0.7065	0.9999 (-0.0010)	0.9999 (-0.0879)	0.9999 (-0.0735)	0.9999 (-0.0904)
Amplico Government Bond	0.0152	0.8169 (-0.0002)	0.9354 (-0.0139)	0.9693 (-0.0110)	0.9918 (-0.0080)
Amplico Money Market Fund	0.0576	0.0000 (0.0004)	0.0185 (0.0311)	0.4788 (0.0032)	0.4788 (0.0032)
Amplico Stable Growth	-0.3653	0.9927 (-0.0010)	0.9959 (-0.0923)	0.9995 (-0.0662)	0.9979 (-0.0825)
Amplico Eastern European Equity	-0.4509	0.9997 (-0.0008)	0.9999 (-0.0665)	0.9999 (-0.0478)	0.9999 (-0.0583)
Arka Polish Equity	-0.6770	0.9999 (-0.0009)	0.9999 (-0.1250)	0.9999 (-0.0659)	0.9999 (-0.0797)
Arka Government Bond	0.0689	0.5319 (0.0002)	0.7687 (0.0085)	0.7642 (0.0086)	0.9955 (0.0024)
Arka Money Market Fund	0.0150	0.5896 (-0.0004)	0.5455 (-0.0462)	0.7765 (-0.0251)	0.9448 (-0.0132)
Arka Stable Growth	-0.3393	0.9885 (-0.0010)	0.9775 (-0.1223)	0.9996 (-0.0601)	0.9981 (-0.0746)
Arka Eastern European Equity	-0.7008	0.9999 (-0.0008)	0.9999 (-0.1019)	0.9999 (-0.0555)	0.9999 (-0.0615)

* Information in brackets reflects the modified Campbell measure of management efficiency
Source: authors own calculation.

In the period of the market crash, only bond funds and cash funds don't incur losses. However, for two of them, i.e. *Arka BZ WBK Ochrony Kapitału (Arka Money Market Fund)* and *Amplico Obligacji Skarbowych kat. A (Amplico Government Bond)*, the efficiency ratio is negative. In the case of all stock funds with probability 0,05, investors lost nearly 100% ($VaR_{0.05} = 0.9999$) of the invested capital per year with an average loss level from 58% to 70% per annum ($CVaR_{0.05}$).

In II period, similar to period I, it is impossible to estimate *VaR* and *CVaR* values using APARCH models for all the analysed funds.

In the period of the bear market, efficiency of funds is evidently lower than in the periods of growth and stabilisation. In the period of the stock market crash, it was only the bond and cash funds that didn't incur any losses. Similarlyin the bull market period, in decline period estimations of *VaR* obtained with models of conditional volatility are higher than estimations obtained with backtesting. Yet, for *CVaR* they are lower.

Table 3

Fund risk and measures of management efficiency for $\alpha = 0.05$, 02.03.2009 – 10.08.2011 – bull market

Society/Investment fund	$E(R_p)$	VaR $(Sh_{VaR}(p)^*$	$VaR \mid \Omega_{t-1}$ $(Sh_{VaR}(p)^*$	$CVaR$ $(Sh_{CVaR}(p)^*$	$CVaR \mid \Omega_{t-1}$ $(Sh_{CVaR}(p)^*$
PZU Polish Equity	0.2752	0.9984 (0.0331)	0.9999 (0.0132)	0.9999 (0.0225)	0.9998 (0.0257)
PZU Government Bond	0.0918	0.6108 (0.0595)	0.4162 (0.1019)	0.7812 (0.0374)	0.7438 (0.0417)
PZU Money Market Fund	0.0719	0.1586 (0.1945)	0.0804 (0.3462)	0.2811 (0.1095)	0.2752 (0.1121)
PZU Stable Growth	0.1145	0.9075 (0.0326)	0.9953 (0.0147)	0.9675 (0.0228)	0.9579 (0.0246)
PZU Eastern European Equity	0.3576	0.9996 (0.0351)	0.9999 (0.0177)	1.0000 (0.0259)	0.9999 (0.0273)
Amplico Polish Equity	0.3072	0.9988 (0.0357)	0.9999 (0.0170)	0.9999 (0.0248)	0.9998 (0.0277)
Amplico Government Bond	0.1637	0.7455 (0.0871)	–	0.9112 (0.0498)	–
Amplico Money Market Fund	0.0977	0.2338 (0.2134)	0.1177 (0.4072)	0.4046 (0.1153)	0.3866 (0.1219)
Amplico Stable Growth	0.1583	0.9208 (0.0457)	0.9938 (0.0231)	0.9803 (0.0297)	0.9810 (0.0295)
Amplico Eastern European Equity	0.2573	0.9914 (0.0418)	0.9997 (0.0249)	0.9983 (0.0312)	0.9974 (0.0336)
Arka Polish Equity	0.2732	0.9983 (0.0335)	0.9999 (0.0118)	0.9999 (0.0219)	0.9997 (0.0259)
Arka Government Bond	0.0989	0.2480 (0.2043)	0.3526 (0.1385)	0.4387 (0.1060)	0.4697 (0.0969)
Arka Money Market Fund	0.0867	0.1455 (0.2837)	0.1991 (0.2108)	0.3639 (0.1102)	0.4345 (0.0886)
Arka Stable Growth	0.1745	0.9067 (0.0546)	0.9968 (0.0228)	0.9730 (0.0361)	0.9564 (0.0415)
Arka Eastern European Equity	0.4260	0.9991 (0.0469)	0.9999 (0.0172)	0.9999 (0.0306)	0.9999 (0.0349)

* Information in brackets reflects the modified Campbell measure of management efficiency
Source: authors own calculation.

In III period, all funds were characterized by positive return and positive efficiency. Nonetheless, in this period the most efficient are cash funds while the least effective are stock funds.

In III period, alike in period I, the most profitable are stock funds. However, one may observe differences in profitability of particular types of stock funds. In period I, the highest rates of return are on funds investing in stocks on developed markets and in Poland, whereas in period III on those funds which invested in the markets of East and Middle East Europe.

In period I and II, estimations of *VaR* and *CVaR* with both methods were generally similar. In III period, there were significant discrepancies in the estimations made with various methods of risk measure for the estimated risk

Table 4

Fund risk and measures of management efficiency for $\alpha = 0.05$, 11.08.2011 – 25.03.2014 – phase of further growth on certain part of markets after a short-term crash

Society/Investment fund	$E(R_p)$	VaR ($Sh_{VaR}(p)$*)	$VaR \mid \Omega_{t-1}$ ($Sh_{VaR}(p)$*)	$CVaR$ ($Sh_{CVaR}(p)$*)	$CVaR \mid \Omega_{t-1}$ ($Sh_{CVaR}(p)$*)
PZU Polish Equity	0.1672	0.9974 (0.0200)	0.9997 (0.0145)	0.9999 (0.0123)	0.9998 (0.0139)
PZU Government Bond	0.1255	0.6370 (0.0782)	0.6663 (0.0724)	0.7749 (0.0538)	0.8280 (0.0457)
PZU Money Market Fund	0.0676	0.1783 (0.1253)	0.1674 (0.1329)	0.2721 (0.0824)	0.2725 (0.0823)
PZU Stable Growth	0.1118	0.9236 (0.0268)	0.9755 (0.0187)	0.9788 (0.0180)	0.9732 (0.0192)
PZU Eastern European Equity	0.1237	0.9975 (0.0134)	0.9987 (0.0121)	0.9999 (0.0091)	0.9998 (0.0097)
Amplico Polish Equity	0.1059	0.9978 (0.0106)	0.9997 (0.0080)	0.9999 (0.0068)	0.9999 (0.0072)
Amplico Government Bond	0.0712	0.5491 (0.0390)	0.4349 (0.0535)	0.7358 (0.0238)	0.7579 (0.0224)
Amplico Money Market Fund	0.0719	0.2193 (0.1167)	0.1508 (0.1658)	0.4242 (0.0563)	0.3378 (0.0739)
Amplico Stable Growth	0.0877	0.8698 (0.0231)	0.9163 (0.0191)	0.9703 (0.0135)	0.9675 (0.0139)
Amplico Eastern European Equity	-0.0158	0.9794 (-0.0134)	0.9901 (-0.0113)	0.9966 (-0.0092)	0.9963 (-0.0093)
Arka Polish Equity	0.1053	0.9950 (0.0121)	0.9990 (0.0093)	0.9998 (0.0073)	0.9998 (0.0076)
Arka Government Bond	0.0867	0.6051 (0.0486)	0.8251 (0.0264)	0.7955 (0.0289)	0.9817 (0.0117)
Arka Money Market Fund	0.0545	0.1224 (0.1007)	0.1686 (0.0760)	0.2390 (0.0543)	0.3613 (0.0347)
Arka Stable Growth	0.0995	0.8757 (0.0277)	0.8873 (0.0265)	0.9630 (0.0176)	0.9629 (0.0177)
Arka Eastern European Equity	0.0569	0.9987 (0.0029)	0.9978 (0.0031)	0.9999 (0.0020)	0.9999 (0.0021)

* Information in brackets reflects the modified Campbell measure of management efficiency
Source: authors own calculation.

with *VaR*. It is particularly noticeable for stock funds, where *VaR* estimations conducted with APARCH models are often over 10 pts higher than estimations conducted with backtesting. Concurrently, for *CVaR* these discrepancies are insignificant.

In the final studied period (Tab. 4), there are small discrepancies between profitability of particular funds. The return of stock funds slightly outbalances the return of the remaining types of funds. In this period, *PZU Papierów Dłużnych POLONEZ (PZU Government Bond)* has a similar return, in some cases even higher when compared with stock funds. Concurrently, *VaR* and *CVaR* values estimated with backtesting in period I and IV produced similar results. *Amplico Zrówna. Nowa Europa* is a very interesting case as it is the only fund which in this period has a mean negative return and negative efficiency ratio.

The ranking of funds with respect to estimated risk and management efficiency, performed on the basis of selected risk measures, is similar. The only change is the position of funds within a group of funds with similar risk level. To evaluate the degree to which the rankings of funds (according to risk measures and efficiency ratios) were similar, correlation coefficients between estimations for the analysed funds were determined (Tab. 5).

Table 5
Correlation coefficients between selected quantile risk measures and efficiency ratios of fund management based on them

Period		Correlation of risk measures				Correlation of efficiency measures			
		VaR	*CVaR*	*VaR* | Ω	*CVaR* | Ω	*VaR*	*CVaR*	*VaR* | Ω	*CVaR* | Ω
First period (bull market)	*VaR*	1.000	0.997	0.964	0.973	1.000	0.775	0.915	0.977
	CVaR	0.997	1.000	0.973	0.994	0.775	1.000	0.937	0.995
	VaR | Ω	0.964	0.973	1.000	0.958	0.915	0.937	1.000	0.923
	CVaR | Ω	0.973	0.994	0.958	1.000	0.977	0.995	0.923	1.000
Second period (Bear market)	*VaR*	1	0.996	0.940	0.982	1	0.977	0.931	0.948
	CVaR	0.996	1	0.949	0.982	0.977	1	0.917	0.985
	VaR | Ω	0.940	0.949	1	0.925	0.931	0.917	1	0.901
	CVaR | Ω	0.982	0.982	0.925	1	0.948	0.985	0.901	1
Third period	*VaR*	1	0.997	0.970	0.998	1	0.974	0.835	0.923
	CVaR	0.997	1	0.985	0.998	0.974	1	0.904	0.984
	VaR | Ω	0.970	0.985	1	0.973	0.835	0.904	1	0.948
	CVaR | Ω	0.998	0.998	0.973	1	0.923	0.984	0.948	1
Fourth period	*VaR*	1	0.997	0.973	0.979	1	0.982	0.948	0.946
	CVaR	0.997	1	0.983	0.983	0.982	1	0.905	0.944
	VaR | Ω	0.973	0.983	1	0.973	0.948	0.905	1	0.968
	CVaR | Ω	0.979	0.983	0.973	1	0.946	0.944	0.968	1

Source: authors own calculation.

Estimations of *VaR* are varied, depending on the assumed definition and method of estimation. On the basis of the results it can be concluded that the ranking of funds due to risk is similar with respect to all variants of *VaR* taken into consideration in the present study, which is confirmed by values of Pearson's linear correlation coefficients shown in Table 5.

All values of these coefficients are positive and statistically significant ($\alpha = 0.05$). As a result, it may be assumed that the analysed investment funds are characterised by a similar model of bottom quantile of rates of return distribution, which can be deduced from the strong correlation between *VaR* and *CVaR*.

Conclusions

In all the analysed periods, money funds have the highest efficiency. In the periods of growth and stabilization, the most profitable are stock funds, whereas in the period of decline, cash and debt securities funds offered the highest profitability, which is in tune with the expectations regarding investment funds. The ranking of funds based on particular risk measures is similar.

As expected, funds investing in financial instruments are characterised by a more stable expected rate of return and the lowest risk in all the analysed periods. Contrary to expectations, stock funds in the periods of a bull market on capital markets, despite high expected rates of return, are not ranked high with respect to fund management efficiency. It resulted from the high level of investment risk in those funds.

It is typical of balanced and stable growth funds to regularly obtain low management efficiency evaluations. In II period, low efficiency evaluation also characterised stock funds, which is connected with significant losses in value of these funds. In IV period, the lowest efficiency had funds locating capital in securities listed on Eastern markets, which is related to low rates of return on investments which do not involve lower investment risk.

Risk in IV period is similar to risk in I period. Investment portfolios in funds are similarly diversified with respect to risk, which may imply a stable investment policy of funds. Concurrently, profitability of funds became alike and the differences between stock funds and other funds became insignificant. This also concerned efficiency ratio of fund management.

An interesting conclusion can be drawn with regard to the *VaR* estimation method. If *VaR* is estimated in a particular moment of time (with backtesting), it is impossible to acknowledge the advantage of econometric models over backtesting. Estimations of risk measures obtained with two methods for various market situations were similar. As estimation of risk changes applied

consistently for time series is of low value for backtesting, in this aspect econometric models gain advantage. On the other hand, estimation with APARCH models was at times impossible, which was of key importance in this study as the goal was to evaluate fund management efficiency in a particular situation on the financial markets. This certainly is a disadvantage which was of less importance to current financial data. Nevertheless, in the case of emerging markets, APARCH models as tools to estimate *VaR* are not always recommended due to the quality of the available data and frequency of their sampling. As for exchange quotations characterised by long periods of unchanged rates of return (revaluation of fund unit value is carried out every few days, but quotations are published on a daily basis), the natural volatility of time series becomes distorted. As a result, models based on conditional volatility do not allow parameter estimators of sufficient value to be obtained. In the case of the backtesting method, which is based on the frequency of events, disturbances in the volatility of a studied period do not have such a big impact on quantile estimation of risk measure. Therefore, in this study, a simpler and definitely equally effective approach is to apply backtesting to evaluate risk and efficiency of investment funds in a specified market situation.

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APPENDIX 1

Original full names of funds

Society/Investment fund	Full name
PZU Polish Equity	PZU Akcji KRAKOWIAK *http:// www.pzu.pl/produkty/pzu-akcji-krakowiak*
PZU Government Bond	PZU Papierów Dłużnych POLONEZ *https://www.pzu.pl/produkty/pzu-papierow-dluznych-polonez*
PZU Money Market Fund	PZU Gotówkowy *https://www.pzu.pl/produkty/pzu-fio-gotowkowy*
PZU Stable Growth	PZU Stabilnego Wzrostu MAZUREK *https://www.pzu.pl/produkty/pzu-stabilnego-wzrostu-mazurek*
PZU Eastern European Equity	PZU Akcji NOWA EUROPA *https://www.pzu.pl/produkty/pzu-akcji-nowa-europa*
Amplico Polish Equity	Amplico Akcji Polskich kat. A *http://notowania.metlifefundusze.pl/index.php*
Amplico Government Bond	Amplico Obligacji Skarbowych *http://notowania.metlifefundusze.pl/index.php*
Amplico Money Market Fund	Amplico Pieniężny *http://notowania.metlifefundusze.pl/index.php*
Amplico Stable Growth	Amplico Stabilnego Wzrostu *http://notowania.metlifefundusze.pl/index.php*
Amplico Eastern European Equity	Amplico Zrównoważony NOWA EUROPA *http://notowania.metlifefundusze.pl/index.php*
Arka Polish Equity	Arka FIO Akcji A *http://arka.pl/produkty/produkty.html*
Arka Government Bond	Arka Obligacji skarbowych A *http://arka.pl/produkty/produkty.html*
Arka Money Market Fund	Arka Ochrony Kapitału (pieniężny) A *http://arka.pl/produkty/produkty.html*
Arka Stable Growth	Arka FIO Stabilnego Wzrostu A *http://arka.pl/produkty/produkty.html*
Arka Eastern European Equity	Arka FIO Akcji Środkowej i Wschodniej Europy (PLN) A *http://arka.pl/produkty/produkty.html*

Statistics of funds returns; 2.01.2006 – 28.12.2007 – bull market

Society/Investment fund	Standard deviation	Skewness	Excess Kurtosis	JB normality test
PZU Polish Equity	0.010892	-0.57601	1.617164	81.96851
PZU Government Bond	0.000794	-0.01036	2.336554	113.5207
PZU Money Market Fund	0.000134	0.322998	1.329768	45.44215
PZU Stable Growth	0.004405	-0.54568	1.531213	73.51287
PZU Eastern European Equity	0.012281	-0.67231	2.85688	207.288
Amplico Polish Equity	0.011453	-0.65728	1.973821	116.9332
Amplico Government Bond	0.00107	0.839261	4.118223	411.2009
Amplico Money Market Fund	0.00038	2.12188	6.395649	1224.917
Amplico Stable Growth	0.004448	-0.73401	2.499144	174.6663
Amplico Eastern European Equity	0.006262	-0.57322	2.389911	146.0824
Arka Polish Equity	0.012532	-0.79587	2.958991	234.7221
Arka Government Bond	0.001304	0.435905	4.159236	375.483
Arka Money Market Fund	0.000294	0.295023	2.075343	96.78939
Arka Stable Growth	0.004719	-0.8144	3.096009	254.4534
Arka Eastern European Equity	0.012889	-1.03262	6.789184	526.6631
POLONIA	0.004418	-0.06616	2.989743	186.2117

Statistics of funds returns; 2.01.2008 – 27.02.2009 – bear market

Society/Investment fund	Standard deviation	Skewness	Excess Kurtosis	JB normality test
PZU Polish Equity	0.017581	-0.22145	1.423464	26.94665
PZU Government Bond	0.002425	-0.9081	7.607309	741.6835
PZU Money Market Fund	0.001457	-0.58993	46.14083	25830.72
PZU Stable Growth	0.00626	-0.45621	2.230781	70.43287
PZU Eastern European Equity	0.026377	0.176919	4.158021	211.1489
Amplico Polish Equity	0.019097	-0.22417	1.826356	42.88109
Amplico Government Bond	0.003755	-3.01004	35.92034	16083.96
Amplico Money Market Fund	0.000778	-5.48595	61.21188	46890.74
Amplico Stable Growth	0.007701	-0.55624	3.443826	158.808
Amplico Eastern European Equity	0.015098	-0.12427	4.824209	282.934
Arka Polish Equity	0.019853	-0.09299	2.133664	55.61877
Arka Government Bond	0.00173	-1.8859	21.20852	5626.335
Arka Money Market Fund	0.001376	-1.84714	10.67431	1547.012
Arka Stable Growth	0.007973	-0.48113	3.549698	164.0065
Arka Eastern European Equity	0.025646	0.226294	3.359008	139.2892
POLONIA	0.007595	-1.12504	1.490734	88.33273

Statistics of funds returns; 2.03.2009 – 10.08.2011 – growth after decline

Society/Investment fund	Standard deviation	Skewness	Excess Kurtosis	JB normality test
PZU Polish Equity	0.011586171	0.053317942	2.315269083	136.3104943
PZU Government Bond	0.0017628	0.141616074	7.196760902	1316.292294
PZU Money Market Fund	0.000507254	-1.81074327	35.95365716	33134.18343
PZU Stable Growth	0.004113361	-0.095087677	1.856562619	88.38090739
PZU Eastern European Equity	0.013168725	-0.154495828	1.519724195	61.0278259
Amplico Polish Equity	0.011861006	0.125644956	2.65352879	180.2731772
Amplico Government Bond	0.003380377	3.774823566	58.22959762	87484.96148
Amplico Money Market Fund	0.000794307	0.868468235	12.15143952	3823.363679
Amplico Stable Growth	0.004818685	0.225349143	3.856702014	382.585964
Amplico Eastern European Equity	0.008340712	0.337994436	2.298194476	145.6184672
Arka Polish Equity	0.01110135	-0.233419183	2.370272209	148.0917583
Arka Government Bond	0.000840429	0.166877174	2.887453935	214.3878481
Arka Money Market Fund	0.000622496	0.251881466	7.008969078	1253.0029
Arka Stable Growth	0.004298434	0.012697679	3.124278019	247.7046109
Arka Eastern European Equity	0.012792742	-0.248315676	2.005746304	108.3426463
POLONIA	0.005885574	0.401138408	-0.192424526	17.2721354

Statistics of funds returns; 11.08.2011 – 25.03.2014 – phase of further growth on certain part of markets after a short-term crash

Society/Investment fund	Standard deviation	Skewness	Excess Kurtosis	JB normality test
PZU Polish Equity	0.010947	-0.86883	5.004058	762.2979
PZU Government Bond	0.001949	-0.16762	2.109217	123.912
PZU Money Market Fund	0.000424	-0.83381	6.733083	1307.135
PZU Stable Growth	0.004626	-0.92413	4.486173	639.5516
PZU Eastern European Equity	0.010823	-0.29901	3.971871	438.2901
Amplico Polish Equity	0.011055	-0.65457	3.75942	430.5118
Amplico Government Bond	0.001508	-1.06926	7.281749	1564.722
Amplico Money Market Fund	0.000785	-4.30183	67.88796	127216
Amplico Stable Growth	0.004025	-1.0412	5.481944	934.2109
Amplico Eastern European Equity	0.006988	-0.14136	2.80618	216.0994
Arka Polish Equity	0.010073	-0.5596	3.626509	391.3138
Arka Government Bond	0.001861	-1.43673	13.79408	5393.489
Arka Money Market Fund	0.000399	-0.62609	19.76005	10650.09
Arka Stable Growth	0.003897	-0.75282	4.175787	535.2957
Arka Eastern European Equity	0.01125	-0.39078	2.572323	196.3517
POLONIA	0.00943	-0.35073	-1.42805	68.76918

APPENDIX 2

Best APARCH, GARCH, IGARCH, EGRACH or GJR type models used in calculation of CVaR; 2.01.2006 – 28.12.2007 – bull market

Society/Investment fund	Conditional mean	Conditional variance	Distribution of random variable
PZU Polish Equity	AR(0)	APARCH(1,1)	Normal
PZU Government Bond	ARMA(1,1)		
PZU Money Market Fund	MA(1)		
PZU Stable Growth	AR(0)	GARCH(1,1)	Normal
PZU Eastern European Equity	AR(0)	APARCH(1,1)	Normal
Amplico Polish Equity	AR(0)	APARCH(1,1)	Normal
Amplico Government Bond	ARMA(3,3)		
Amplico Money Market Fund	MA(2)	GARCH(1,1)	Normal
Amplico Stable Growth	AR(0)	GJR(1,1)	Normal
Amplico Eastern European Equity	AR(0)	APARCH(1,1)	Normal
Arka Polish Equity	AR(0)	GARCH(1,1)	Normal
Arka Government Bond	MA(2)		
Arka Money Market Fund	AR(2)	GARCH(1,1)	*t*-Student
Arka Stable Growth	AR(0)	GARCH(1,1)	Normal
Arka Eastern European Equity	AR(0)	GARCH(1,1)	Normal

Best APARCH, GARCH, IGARCH, EGRACH or GJR type models used in calculation of CVaR; 2.01.2008 – 27.02.2009 – bear market

Society/Investment fund	Conditional mean	Conditional variance	Distribution of random variable
PZU Polish Equity	AR(0)	IGARCH(1,1)	Normal
PZU Government Bond	MA(3)		
PZU Money Market Fund	ARMA(6,7)		
PZU Stable Growth	AR(0)	GARCH(1,1)	Normal
PZU Eastern European Equity	AR(0)	IGARCH(1,1)	Normal
Amplico Polish Equity	AR(1)	IGARCH(1,1)	Normal
Amplico Government Bond	AR(0)	GARCH(,1)	Normal
Amplico Money Market Fund	AR(0)	IGARCH(1,1)	*t*-Student
Amplico Stable Growth	MA(1)	IGARCH(1,1)	Normal
Amplico Eastern European Equity	AR(0)	IGARCH(1,1)	Normal
Arka Polish Equity	AR(0)	IGARCH(1,1)	Normal
Arka Government Bond	ARMA(1,1)	GJR(1,1)	Normal
Arka Money Market Fund	ARMA(1,1)	IGARCH(6,6)	Normal
Arka Stable Growth	ARMA(1,1)	GARCH(1,1)	Normal
Arka Eastern European Equity	AR(0)	GARCH(1,1)	*t*-Student

Best APARCH, GARCH, IGARCH, EGRACH or GJR type models used in calculation of CVaR; 2.03.2009 – 10.08.2011 – growth after decline

Society/Investment fund	Conditional mean	Conditional variance	Distribution of random variable
PZU Polish Equity	AR(1)	APARCH(1,1)	Normal
PZU Government Bond	AR(2)	GJR(1,1)	*t*-Student
PZU Money Market Fund	MA(2)	IGARCH(1,1)	*t*-Student
PZU Stable Growth	AR(1)	GARCH(1,1)	Normal
PZU Eastern European Equity	AR(0)	GARCH(1,1)	Normal
Amplico Polish Equity	AR(1)	GARCH(1,1)	*t*-Student
Amplico Government Bond	AR(0)		
Amplico Money Market Fund	AR(1)	IGARCH(1,1)	*t*-Student
Amplico Stable Growth	MA(1)	GARCH(1,1)	Normal
Amplico Eastern European Equity	MA(1)	GARCH(1,1)	Normal
Arka Polish Equity	ARMA(1,1)	APARCH(1,1)	Normal
Arka Government Bond	AR(1)	GARCH(1,1)	*t*-Student
Arka Money Market Fund	AR(1)	IGARCH(1,1)	*t*-Student
Arka Stable Growth	AR(1)	IGARCH(1,1)	*t*-Student
Arka Eastern European Equity	AR(1)	APARCH(1,1)	Normal

Best APARCH, GARCH, IGARCH, EGRACH or GJR type models used in calculation of CVaR; 11.08.2011 – 25.03.2014 – phase of further growth on certain part of markets after a short-term crash

Society/Investment fund	Conditional mean	Conditional variance	Distribution of random variable
PZU Polish Equity	ARMA(1,2)	GARCH(1,1)	*t*-Student
PZU Government Bond	AR(1)	IGARCH(1,2)	*t*-Student
PZU Money Market Fund	MA(1)	IGARCH(1,1)	*t*-Student
PZU Stable Growth	AR(0)	GARCH(1,1)	Normal
PZU Eastern European Equity	AR(0)	GARCH(1,1)	Normal
Amplico Polish Equity	AR(0)	GARCH(1,1)	Normal
Amplico Government Bond	AR(1)	IGARCH(1,1)	*t*-Student
Amplico Money Market Fund	AR(0)	IGARCH(1,1)	*t*-Student
Amplico Stable Growth	AR(0)	GARCH(1,1)	*t*-Student
Amplico Eastern European Equity	AR(0)	GARCH(1,1)	Normal
Arka Polish Equity	AR(0)	GARCH(1,1)	*t*-Student
Arka Government Bond	MA(1)	GARCH(1,1)	Normal
Arka Money Market Fund	AR(2)	IGARCH(1,1)	*t*-Student
Arka Stable Growth	AR(0)	GARCH(1,1)	Normal
Arka Eastern European Equity	AR(0)	GARCH(1,1)	*t*-Student

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INDICATORS OF SUSTAINABLE DEVELOPMENT OF THE PROVINCE OF WARMIA AND MAZURY IN THE ENVIRONMENTAL ASPECT

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K e y w o r d s: sustainable development, indicator method.

A b s t r a c t

The purpose of this study has been to identify the degree of sustainability in the development of the Province of Warmia and Mazury. The theoretical and empirical investigations were conducted between 2003–2014 based on data from the Local Data Bank. Using a comparative indicator method, 20 indicators were developed, with different directions of preference. The evaluation involves the concept of uniform preference, hence the higher the assessment indicator, the better the situation in the evaluated area unit. Our studies on the sustainable development of the Province of Warmia and Mazury suggest that the indicators measuring the environmental dimension and consequently the quality of life of the residents (in this aspect) score higher than the country's average values. It is also optimistic that some progress, however small, can be seen in this area based on the analyzed dynamics of changes.

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S ł o w a k l u c z o w e: rozwój zrównoważony, ocena wskaźnikowa.

A b s t r a k t

Celem badań było określenie stopnia zrównoważenia rozwoju województwa warmińsko-mazurskiego w aspekcie środowiskowym. Badania teoretyczne i empiryczne prowadzono w latach 2003–2014 na bazie danych zebranych z zasobów Banku Danych Lokalnych (BDL). Wskaźnikową

metodą porównawczą opracowano 20 wskaźników o różnych kierunkach preferencji. Dla każdego wskaźnika obliczono tzw. ocenę pokazującą, o ile procent wskaźnik jest lepszy lub gorszy od średniej dla porównywanych województw. Z badań nad zrównoważeniem rozwoju w województwie warmińsko-mazurskim wynika, że wskaźniki charakteryzujące ład środowiskowy, a tym samym jakość życia mieszkańców (w tym aspekcie) są wyższe niż średnio w kraju. Optymistyczne jest również to, że analizując dynamikę zmian można zauważyć postęp, choć znikomy.

Introduction

According to DIEFENBACHER (2009, p. 194–208), the concept of "sustainability" is not obvious *per se*. In politics, it is often perceived in line with the economic interest of the involved persons. In academic debates, especially in discussions on sustainable development, definitions are far more consistent. Whenever the issue of sustainable development is raised, it almost invariably pertains to a situation of strong permanence that should ensure intra- and inter-generation fairness. Prior to discussing the general concept of sustainable development, it is advisable to proceed first through the process of operationalization, from the identification of the dimensions of sustainable development to the establishment of relevant indicators, which will lend themselves to the task of making an assessment of how far the contemporary society is distant from attaining sustainability. This will allow for an evaluation of the current situation and identification of areas which need further action. The following study is an effort to apply some indicators for the sake of presenting changes in the environmental dimension of sustainability.

Until the 1990s, Poland was one of the most severely polluted countries in Europe. Industralization and urban development in Poland had been progressing at the expense of environmental protection and conservation. Social and economic considerations had prevailed over ecological concerns. A significant stimulus for striving towards sustainable development came from the prospective European Union membership. Provisions of the Accession Treaty posed enormous challenges that Poland had to face. Within the European Union, the economic backwardness of East European countries has been diminishing gradually over the past decade. Conversely, internal differences between regions in each country have grown bigger (KOSIEDOWSKI 2009, p. 194–208).

One of the essential goals of sustainable development is to improve the broadly understood quality of life for both present and future generations. However, a question arises as to the meaning of the quality of life. The way it is understood by individual people depends on numerous factors, including culture, religion, social bonds and the degree to which both material and spiritual needs are satisfied. KRUK (2009, p. 64–75) cites several definitions,

which proves that the term "quality of life" has been defined on a number of occasions. What all these definitions share is the claim that quality of life is the feeling of having one's needs satisfied. In our search for measures of the quality of life, we distinguish objective and subjective appoaches. Two terms should be mentioned: "quality of life" and "the sense of the quality of life". "Quality of life" pertains to the external sphere, which is a source of stimuli and experiences for individual persons. The quality of life is a product of subjective measurements. "The sense of the quality of life" refers to the sphere of emotions and lacks subjective meaures. These questions are discussed broadly, with numerous references to the literature, by OWSIŃSKI and TARCHALSKI (2008, p. 59–95).

The perception of the quality of life keeps changing as our civilization is developing and the level at which people's needs are satisfied is raised higher and higher. Apart from principal societal order indicators such as health (life expectancy), welfare, education, economy (access to products and services, income per capita), measurements of life quality also involve indicators related to the environmental dimension of sustainability, e.g. access to environmental protection infrastructure. Sustainable development indicators facilitate the monitoring of the environmental dimension of sustainability, which would be best done through cyclic assessments. The literature (BORYS 1999, p. 247–334) suggests indicators which can be applied in practice to different levels of organization, including regions, and which can serve for calculating various indices (ŁAGUNA, WITKOWSKA-DĄBROWSKA 2008, p. 92–102).

Research methodology

The purpose of this study has been to identify the degree of sustainability in the development of the Province of Warmia and Mazury, Poland, in the area of environmental order.

The theoretical and empirical investigations were conducted between 2003–2014 (10 years in the European Union) based on data from the Local Data Bank. Using a comparative indicator method, 20 indicators were developed, with different directions of preference (Tab. 1).

The research employed a theme-based classification of indicators, which led to the construction of a pyramid of indicators. A similar type of classification is used by the Local Data Bank, which facilitated the use of their data. Within the environmental dimension, several themes were distinguished. The proposed indicators underwent some modifications and transfer or adjustment to various themes during the research (WITKOWSKA-DĄBROWSKA 2011, p. 263–274). As a result, a theme-based system was achieved.

Table 1
Themes and the number of indicators selected for the study on sustainable development in the Province of Warmia and Mazury

Themes and indicators	Number of indicators
Protection of nature and landscape	6
Protection and sustainable development of forests, parks and urban greenery	4
Waste and sewage management	5
Water economy	5
Total	20

Source: adapted from *Wskaźniki zrównoważonego rozwoju* (2005, p. 62–321).

Our selection of indicators was based on the principle of causality, which posits that human activity influences the environment and is a cause of favourable and unfavourable changes (Tab. 2).

These indicators are associated with groups of goals defined in the Environmental Policy of the State, in which conservation of biodversity is mentioned as one of the objectives. It is manifested by the delineation of legally protected areas, and by protection of soils and forests. In this article, certain biodiversity problems have been included within the indicators identifying the level of afforestation and protection of the environment and landscape. They illustrate the current state and implicate major sources of problems as well as possible ways to reverse or alleviate consequences of anthropopressure. The state's Environmental Policy dedicates much attention to the protection of natural resources. Biodiversity of nature has a high value in Poland. Currently, Poland's territory comprises various forms of legally protected most valuable natural assets, although the total area of 23 national parks and 400 reserves equals just 1.5% of the country's area, and the area of 120 landscape parks corresponds to 8% of Poland's area. Woodlands are an immensely valuable natural resource of Poland, as they cover nearly 30% of the country's area. The biggest challenge facing the State Forests at the moment is to transform the forest economy from the one dominated by economic goals to a multifunctial economy, in line with the priciples of permanently sustainable forest management, because forests perform many valuable functions apart from timber production, e.g. protecting natural diversity, improving water retention, preventing soil erosion, providing space for human recreation and relaxation[1].

The so-called demonstrative value was calculated for each indicator, showing by what per cent a given indicator is better or worse than the mean for all

[1] Polityka ekologiczna państwa w latach 2009–2012 z perspektywą do roku 2016. 2008. Ministerstwo Ochrony Środowiska, https://www.mos.gov.pl (access: 1.06.2016).

Table 2

Themes, indicators and directions of preferences in environmental order

No	Themes and indicators	Direction of preference
1.	Protection of nature and landscape	stimulating/destimulating
1.1.	share of farmland in total area of the province (%),	stimulating
1.2.	share of nature reserves in total area of nature protected lands (%)	stimulating
1.3.	share of ecological utilities in total area of nature protected lands (%)	stimulating
1.4.	share of landscape parks and protected landscape areas in total area of nature protected lands (%)	stimulating
1.5.	share of the coverage of legally protected land in total area of the province (%)	stimulating
1.6.	ratio of funds from the province's budget to total inputs to nature conservation and protection (%)	stimulating
2.	Protection and sustainable development of forests, parks and urban greenery	stimulating/destimulating
2.1.	forested land (%),	stimulating
2.2.	ratio of reforested and afforested land to total area of the province (%)	stimulating
2.3.	forest fires (in ha per 1000 ha of forests)	destimulating
2.4.	reproduction of public greenery, tree stands, etc. to total area (%)	stimulating
3.	Waste and sewage management	stimulating/destimulating
3.1.	ratio of households served by WTPs to total population (%)	stimulating
3.2.	ratio of the population served by the sewage system to total population (%)	stimulating
3.3.	length of the sewage system to length of waterworks (m)	stimulating
3.4.	share of disposed waste to total amount of waste generated in a year (%)	destimulating
3.5.	volume of investment inputs to waste management economy in PLN per capita	stimulating
4.	water economy	stimulating/destimulating
4.1.	share of the population connected to waterworks to total population (%)	stimulating
4.2.	volume of water used in agriculture and forestry to total water consumption by domestic economy and households (%)	destimulating
4.3.	volume of water used by households and consumed by domestic economy per capita (m^3)	destimulating
4.4.	volume of water drawn from groundwater resources for industrial purpose to total consumption of water in industries (%)	destimulating
4.5.	volume of investment inputs to water and sewage management in PLN per capita	stimulating
Total	20 indicators	15/5

Source: the authors, based on: *Wskaźniki zrównoważonego rozwoju* (2005, p. 62–321).

compared provinces (ROGALA 2005, p. 237–246). The evaluation involves the concept of uniform preference, hence the higher the assessment indicator, the better the situation in the evaluated area unit, while the mean for the other units stands for 100%. The method used in the research was the one known as zero unitarization, in which "unitarized" indicators are referred to the mean through the following equations (BORYS, ROGALA 2004, p. 601–608):

1. for stimulating indicators
   $O_P = [(W_i - W_{min})/(W_{max} - W_{min})] \times 100\%$;
2. for destimulating indicators
   $O_R = [(W_{max} - W_i)/(W_{max} - W_{min})] \times 100\%$;
3. for the mean of a stimulating indicator
   $O_{P\text{-}mean} = [(W_{śred.} - W_{min})/(W_{max} - W_{min})] \times 100\%$;
4. for the mean of a destimulating indicator
   $O_{R\text{-}mean} = [(W_{max} - W_{śred.})/(W_{max} - W_{min})] \times 100\%$;

where:
O_P or O_R – point assessment of W indicator for the province,
$O_{P\text{-}mean}$ lub $O_{R\text{-}mean}$ – a score assessment of the mean value of indicators for the whole group of units (provinces) compared; this assessment depends on the distribution of the level of an indicator:
W_i – the level of a given indicator in the unit submitted to assessment,
W_{min} – the minimum level of the indicator in a given sample,
W_{max} – the maximum level of the indicator in a given sample,
$W_{śred.}$ – the mean of the indicator in a given sample;

5. The calculated indicators were referred to the mean level achieved in the compared group of units according to the formula:
   $[(O_p/O_{P\text{-}mean}) \times 100\%] - 100\%$ or $[(O_R/O_{R\text{-}mean}) \times 100\%] - 100\%$.

Based on the results, the dynamics of changes in 2003–2009 was determined, with the year 2003 serving as the base reference for the indices.

Research results

The surface area of the Province of Warmia and Mazury is 24,203 km^2, which corresponds to 7.7% of Poland's total area, and this makes it the fourth largest province in the country. It has varied land relief and diverse natural resources, including inland freshwaters (over 6%). Woodlands cover around 30%, which is close to the country's average percentage. Over 54% of the area is made up of farmland. The population is 1.4 million and its density is the country's lowest, at 59 persons per 1 km^2. There is some ethnic diversity

among the province's residents. The population is relatively young: 23.2% are pre-working age people, 13.3% are working age and 63.5% are post-working age. This province is among the least polluted ones in Poland. The major industries are: food processing and the furniture industry. Owing to the local natural resources, tourism and aquaculture thrive in this area (WITKOWSKA-DĄBROWSKA, BĄCZKOWSKI 2010). In 2015, there were 123,876 business entities registered in the REGON system (as of the end of the year), i.e. 0.09 per capita.

Fig 1. presents data collated for individual areas in the years: 2003, 2005, 2007, 2009 and 2014. The specific orders and themes have been discussed previously, but values of some indicators might be different than the ones given in the table because the selection of indicators has been somewhat modified while the adopted research method was being verified in the curent study (WITKOWSKA-DĄBROWSKA 2009, p. 61–71).

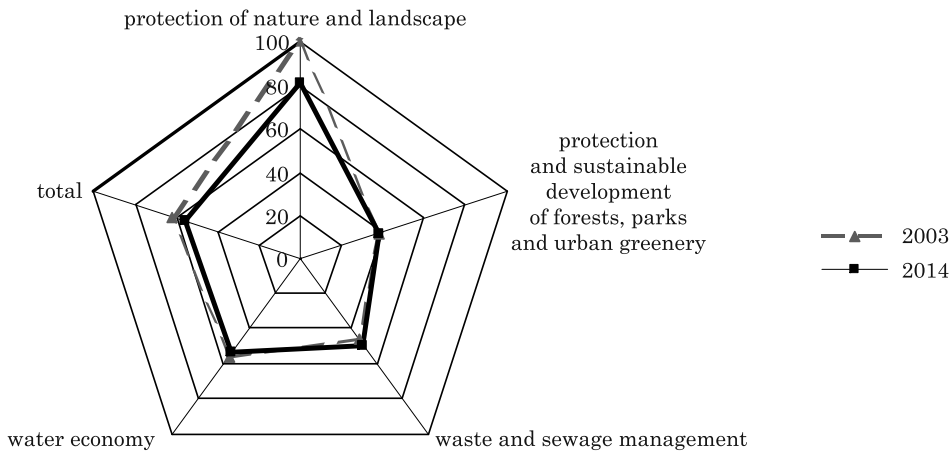

Fig. 1. Assessment of the sustainability of environmental order in the Province of Warmia and Mazury compared to other Polish provinces (%)
Source: the authors, based on the data from Local Data Bank (BDL) and Central Statistical Office (GUS) in Poland.

Within the environmental dimension, all the indicators selected within the themes attained higher values than the mean values for the other Polish provinces. The highest score was noted for the theme identified as the protection of the environment and landscape. Nature and landscape protection scored very well mostly because of the high values assigned to two indicators: inputs allocated from the Province's budget to nature protection and the share of areas under legal protection in the whole province. Our study has also demonstrated high dynamics of changes (Fig. 2). The time span was divided into stages: 2003 – prior to the EU accession, 2005 to 2007 – the time when the

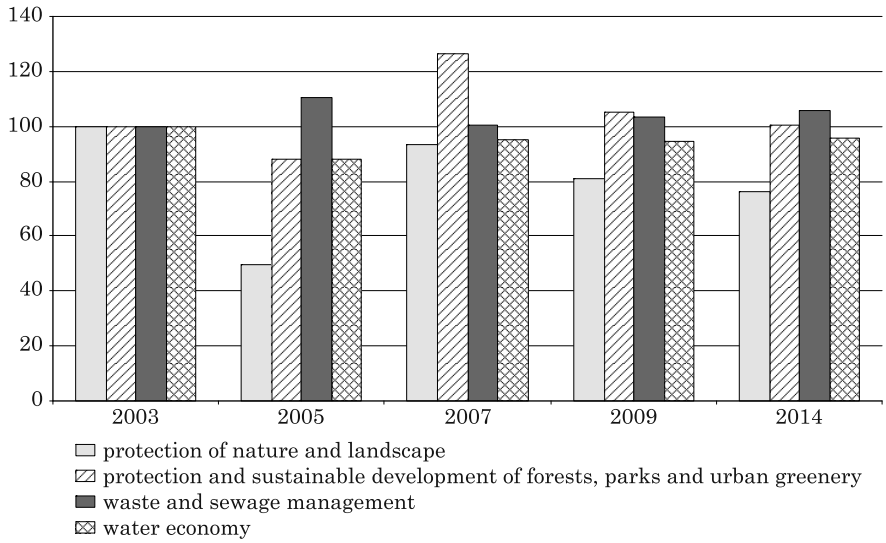

Fig. 2. Dynamics of changes in the assessment of sustainability in environmental order
Source: the authors, based on the data from Local Data Bank (BDL) and Main Statistical Office (GUS) in Poland.

state's previous environmental policy was binding, 2009 – the currently binding environmental policy was brought to life, 2013 – ten years in the EU. The index value of 2005 relative to the base one of 2003 was just 52.44%, but it rose to 93.32% in 2007 and oscillated around 80% in 2009 and on. The other themes were characterized by considerable changes as well, with the differences versus the base year 2003 ranging from 88.00% to 126.68%. Nevertheless, only one area, i.e. such as waste management, presented higher dynamics of changes relative to 2003 in all the analyzed years.

The regional problem that remains unresolved in the scope of environmental order is the low saturation of sewage and gas pipeline installations (Tab. 3). While the accessibility of sewers improves, both in the region and in whole Poland, the number of households connected to piped gas installations is on the decrease. Noteworthy, the Province of Warmia and Mazury had a distinctly higher share of the population using water and sewage networks throughout the analyzed decade, while having a lower percentage of households connected to gas pipes. During the whole time period of 2003–2014, the share of population in Poland living in households connected to waterworks increased by nearly 10%. In 2012, over 64% of inhabitants of urban municipalities across Poland used waterworks as compared to 67% of residents of the Province of Warmia and Mazury[2]. As with waterworks, the share of households connected

[2] More detail in: (Witkowska-Dąbrowska 2015, p. 55–65).

to sewage systems in the rovince of Warmia and Mazury was about 5% higher (4% since 2008) than in whole Poland. However, the percentage of population living in households connected to sewage systems was considerably lower in rural communes than in rural-urban (by nearly two-fold) and in urban (by nearly four-fold) communes, both in the province and in whole Poland.

Table 3

Share of population using the linear environmental protection infrastructure in Poland and in the Province of Warmia and Mazury (%)

Wyszczególnienie	Years				
	2003	2005	2007	2009	2014
Share of population with access to waterworks					
Poland	85.1	86.1	86.7	87.3	91.6
Warmia and Mazury	86.4	87.9	88.3	88.9	94.6
Share of population with access to a sewage system					
Poland	57.4	59.2	60.3	61.5	68.7
Warmia and Mazury	62.7	64.4	65.0	65.7	73.4
Share of population with access to a gas network					
Poland	54.2	51.7	51.7	52.6	52.2
Warmia and Mazury	45.1	44.8	44.2	43.9	42.8

Source: the authors, based on the data from Local Data Bank (BDL) and Central Statistical Office (GUS) in Poland.

The dynamics (Fig. 3) of these changes in the analyzed years testifies to the general increase in sustainability, in this regard. During that decade, the percentage of households connected to waterworks and sewage systems increased steadily. The dynamics of changes demonstrated by the index with the constant base shows a rather stable growth, with the accessibility to sewage systems slightly dominating. The largest disproportion existed in the number of households having a piped gas supply. The share of the population in Poland using piped gas systems is slightly more than 50%, while in this province it is lower by about 9 per cent points. Moreover, a decrease by 2 per cent points occurred in the analyzed decade relative to the first year (2003). The share of population with piped gas connection varied over a small range. Eventually, a decrease in the percentage of households connected to piped gas appeared in urban communes in Poland and in the Province of Warmia and Mazury. However, differences in the accessibility of piped gas between urban, urban-rural and rural communes remain the most serious problem. Nationally, the share of households in rural areas with piped gas connection was 21.6% in 2012, while in the rural communes of Warmia and Mazury it was as low as 4.8% (WITKOWSKA-DĄBROWSKA 2015, p. 55–65).

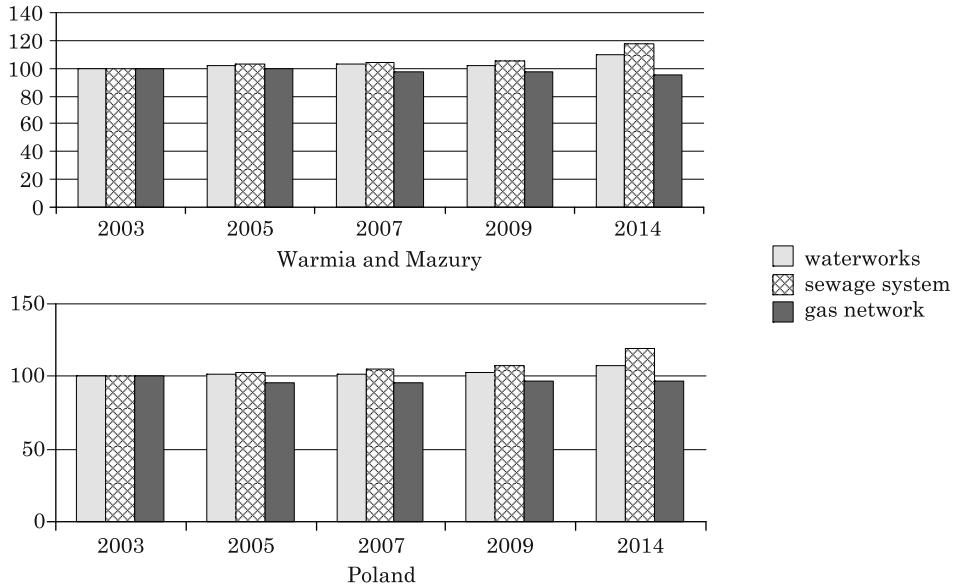

Fig. 3. Dynamics of changes in the share of population using linear environmental protection infrastructure

Source: the authors, based on the data from Local Data Bank (BDL) and Central Statistical Office (GUS) in Poland.

Until 2009, however, the above differences had never exceeded a few per cent. Afterwards, an evident growth was observed until 2014, especially in the share of households having access to sewage systems. Similar tendencies were noted in the Province of Warmia and Mazury and in whole Poland. With regard to households connected to piped gas, in most of the years submitted to our analysis, a decrease was observed in the province compared to the base year of 2003. Similar data were collected in whole Poland. KRUK (2009, p. 64–75) after F.J. Ayala-Carcedo claims that economic growth precedes social growth, and only afterwards it is possible to pursue sustainable development, which entails care for nature.

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GUIDELINES FOR TEXT PREPARATION FOR THE "OLSZTYN ECONOMIC JOURNAL"

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– Authors should consider comments by reviewers and comment on them.

After receiving the review, the author shall send to the editor:

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2) a corrected copy of the paper in English with the title, key words and abstract in Polish (on CD),
3) response to the review,
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Each paper should consist of the identified following parts:

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4) conclusion,
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Graphic materials (drawings, diagrams, graphs) should be prepared in the software operating in the Windows environment (e.g. Excel, Corel Draw). Figures prepared in other specialist software should be recorded in the Windows Metafile (*.wmf) format allowing importing them to Corel. In the text references to the figures and tables should be made in the sequence from 1 to n (according to the numbering).

Under the tables and figures their source should be given.

We do not accept handmade drawings, photocopies, scans and materials from the.

REFERENCES AND BIBLIOGRAPHY

The literature should be quoted in the paper by providing the author;s name, year and pages in brackets (e.g. Kowalski 1999, p. 23, Kowalski, Nowak 2000, pp. 5–8, Wiśniewski et al. 2003, pp. 34–56) or ... according to Wiśniewski (2000, pp. 11–12).

If the reference in the text concerns a collective paper, instead of the author;s name the **full title of the paper** (Elektronika. 1993) or the abbreviated title (Dbajmy o właściwe suszarnictwo... 1992) should be given.

The bibliography should be set in the alphabetic order (without numbering) in the following way: surname(s) of the author(s), initials, year of publication (when more papers were published by the same author during the same year the individual papers should be marked by letters a, b, c etc. after the year), title (in italics), bibliographic abbreviation of the publisher and place of publication or name of the periodical, volume number, number and page number.

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Karpacki M., Sawicki H. 1980. *Ekonomika i organizacja gospodarstw wiejskich*. PWN, Warszawa.

Kos C. 1997. *Marketing produktów żywnościowych*. PWRiL, Warszawa.

Collective papers: Dbajmy o właściwe suszarnictwo ziarna. Red. K. Lewin 1982. T. 1. PWN, Warszawa.

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