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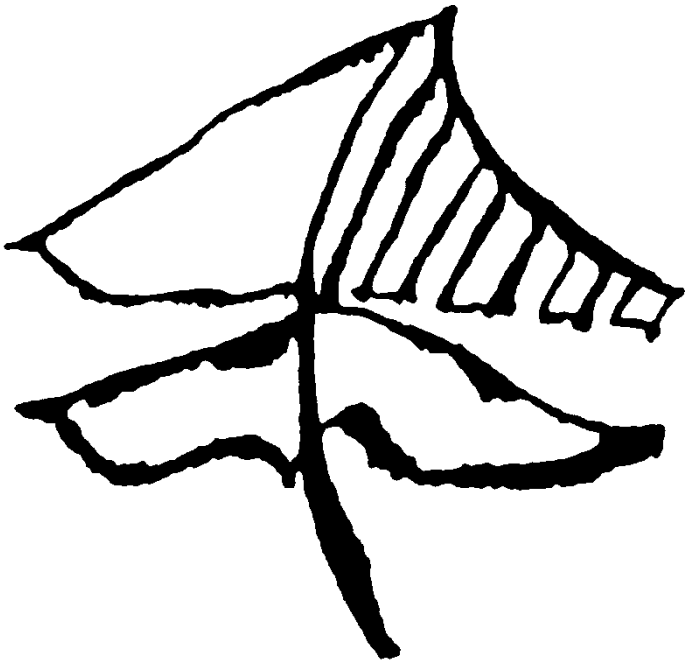

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Scientific Quarterly INTERCATHEDRA is the result of scientific, research and teaching cooperation of departments from Poznań, Zwoleń, Warsaw, Kraków, Olsztyn, Tarnów, Trnava, Zlin, Žilina, Košice, Zagreb, Brno, Prešov and other Polish and foreign scientific centres dealing with issues of economics, organisation, programming, management and marketing, especially, but not only, in arboriculture.

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Wojciech Lis

Emilia Grzegorzewska[1]

REGIONAL DIVERSITY OF THE LEVEL OF INNOVATION IN POLISH SERVICE ENTERPRISES – THE ECONOMIC DIMENSION

Abstract: The paper presents changes in the level of innovation in Polish service companies allowing for the regional division of the country. The article covers the scale of innovative activity and its influence on economic results of the analysed economic subjects. The effectiveness of these actions are evaluated on the basis of the share of revenues from sales of new or significantly improved products in total sales as well as financial outlays on innovative activity. The timeframe of the research comprised the years 2010-2014.

Key words: innovation, service companies, regional diversity

INTRODUCTION

Companies' innovation is an impulse for economic development of any country. As it follows from recent research by European Commission Poland ranks among the group of moderate innovators. However, more often than not in the analyses it is emphasised that the level of innovation in the country is not satisfying [Sacio-Szymańska 2011, Kasperkiewicz 2011, Taranko 2011, Piekut 2012, Nowak 2012, Gmurczyk 2014, Zadura – Lichota i in. 2015]. Poland's far position in the ranking signifies that the home economy belongs to the least innovative economies in Europe. Economic growth is based on low labour costs, great domestic market and funds from the European Union.

Taking into account the regional diversity one may observe similar tendencies in innovative activity of economic subjects. The innovativeness of the country is the product of the level of innovation of particular regions and enterprises that function on a given area.

OBJECTIVE AND RESEARCH METHODOLOGY

The primary aim of the research was the economic evaluation of innovative activity in service companies in Poland which was conducted on the basis of regional diversity of the country. The timeframe covers the years 2010-2014. The primary research materials were the reports entitled 'Innovation activities of enterprises' published annually by the Central Statistical Office (CSO).

The article presets change trends in the level of innovation in companies from the service sector allowing for the regional diversity. The analyses comprise the percentage of innovatively active enterprises (that is the ones which undertook actions in the field of innovation even though they did not succeed in implementing the innovation) as well as innovative enterprises (that is the ones which realized at least one innovative project and launched an innovative solution).

Taking into consideration the effectiveness and profitability of innovative activity, its influence on economic results has to be evaluated. For that reason, the article presents change trends in chosen ratios, that is the share of revenues from the sales of new or significantly improved products in total sales as well as outlays on innovative activity altogether per one researched enterprise. Moreover, the analyses were complemented with the findings from the report prepared by the European Commission entitled 'Regional Innovation Scoreboard 2014', which presents the evaluation of the level of innovation in 190 regions of the EU, Norway and Switzerland. The researched regions were divided into 4 groups: innovation leaders (34 regions), strong innovators (57 regions), moderate innovators (68 regions) and modest innovators (31 regions).

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RESEARCH FINDINGS

From the research conducted by CSO (Central Statistical Office) it follows that in the years 2010-2012 every fifth service company in Masovian voivodeship was innovatively active (19.5%) (table 1). Other places were occupied by the following regions: Kujavian-Pomeranian (16.5%), Lesser Poland (15.1%) and Lower Silesian (14.1%). The regions that ranked last, however, there were: Warmian-Masurian, Opole and Podlaskie. The percentage of service companies that were innovatively active amounted to, respectively: 5.5%, 5.7% and 8.3%. In the years 2012-2014 the first three places among the most innovatively active companies there were the following voivodeships: Lublin (18.3%), Opole (15.9%) and Masovian (15.8%). Lublin voivodeship was in the lead of the ranking of innovatively active service companies (21.9%). The least innovative in this field there proved to be service companies from: Warmian-Masurian, Lubusz and Greater Poland. It needs to be emphasized as well that in the timeframe of 2010-2014 the greatest rise in the ranking of the enterprises that undertook innovative activity was noted in: Opole (13 positions), Lublin (7 positions) and Silesian (7 positions). In the first of the mentioned regions the percentage of innovatively active companies increased almost threefold from 5.7% to 15.9%.

Table 1. Innovatively active service enterprises in the years 2010-2014 by voivodships

Voivodeship	2010/2012 [%]	2011/2013 [%]	2012/2014 [%]	Change 2012/2014 – 2010/2012 [%]	Change in the position 2012/2014 – 2010/2012
Lublin	12.1 (8)	11.1 (8)	18.3 (1)	6.2	+7
Opole	5.7 (15)	10.5 (12)	15.9 (2)	10.2	+13
Masovian	19.5 (1)	16.6 (1)	15.8 (3)	-3.7	-2
Łódź	12.7 (6)	11.0 (9)	13.0 (4)	0.3	2
Silesian	10.0 (12)	12.6 (4)	12.9 (5)	2.9	+7
Lesser Poland	15.1 (3)	13.4 (3)	11.9 (6)	-3.2	-3
Subcarpathian	12.6 (7)	9.6 (15)	11.9 (7)	-0.7	no changes
Lower Silesian	14.1 (4)	15.6 (2)	11.9 (8)	-2.2	-4
West Pomeranian	11.9 (9)	12.5 (5)	11.6 (9)	-0.3	no changes
Podlaskie	8.3 (14)	12.2 (6)	11.3 (10)	5.0	+4
Kujavian-Pomeranian	16.5 (2)	10.7 (11)	10.5 (11)	-6.0	-9
Świętokrzyskie	8.6 (13)	6.7 (16)	9.3 (12)	0.7	+1
Pomeranian	11.4 (11)	10.8 (10)	9.0 (13)	-2.4	-2
Greater Poland	11.7 (10)	10.3 (13)	8.2 (14)	-3.5	-4
Lubusz	12.8 (5)	11.1 (7)	5.8 (15)	-6.7	-10
Warmian-Masurian	5.5 (16)	9.7 (14)	4.7 (16)	-0,8	no changes

Source: own study on the basis of CSO reports – 'Innovation activities of enterprises' covering the years 2010-2014.

Significant information on the subject of the scale of innovation is derived from the percentage of innovative companies that is the ones that in the period of three years preceding the research introduced at least one innovation. From table 2 it follows that in the years 2010-2014 the percentage of companies from the service sector decreased by 1 p.p. to 11.4%.

Table 2. Innovative service enterprises in the years 2010-2014 by voivodships

Voivodeship	2010/2012	2011/2013	2012/2014	Change 2012/2014 – 2010/2012 [%]	Change in the position 2012/2014 – 2010/2012
Lublin	11.4 (8)	10.1 (8)	17.5 (1)	6.1	No changes
Opole	5.6 (15)	10.1 (9)	15.7 (2)	10.1	+13
Masovian	16.9 (1)	15.2 (1)	15.1 (3)	-1.8	-2
Łódź	11.4 (9)	10.4 (7)	11.9 (4)	0.5	+5
Lesser Poland	13.0 (2)	11.8 (5)	11.5 (5)	-1.5	-3
Silesian	8.9 (12)	10.8 (6)	11.4 (6)	2.5	+6
Subcarpathian	11.6 (6)	9.5 (12)	10.8 (7)	-0.8	-1
West Pomeranian	11.7 (5)	12.5 (3)	10.7 (8)	-1.0	-3
Podlaskie	8.1 (14)	12.0 (4)	10.6 (9)	2.5	+5
Lower Silesian	12.9 (3)	13.4 (2)	10.5 (10)	-2.4	-7
Kujavian-Pomeranian	10.8 (10)	8.4 (14)	10.0 (11)	-0.8	-1
Świętokrzyskie	8.4 (13)	6.7 (15)	8.1 (12)	-0.3	+1
Pomeranian	10.7 (11)	9.6 (10)	8.1 (13)	-2.6	-2
Greater Poland	11.6 (7)	8.5 (14)	7.7 (14)	-3.9	-7
Lubusz	12.2 (4)	9.5 (11)	7.7 (15)	-4.5	-11
Warmian-Masurian	3.0 (16)	9.1 (13)	4.4 (16)	1.4	no changes
Total	12.4	11.4	11.4	-1.0	-

Source: own study on the basis of CSO reports – 'Innovation activities of enterprises' covering the years 2010-2014.

At the beginning of the analysed period the leader of innovation in service companies was Masovian district (16.9%) which only in the years 2012-2014 fell and ranked third in the ranking. Moreover, other places of the ranking were occupied by: Lesser Poland (13%) and Lower Silesian (12.9%). It has to be stressed that the leaders in service companies achieved better results by a few percentage points. It means then that regardless of the regional diversity in the level of innovation, the greatest scale of the phenomenon was observed in industry which is borne out by a mediocre percentage of innovative enterprises from these economy sectors. In the ranking of innovative service companies covering the years 2012/2014 the first place was occupied by Lublin voivodeship (17.5%). Furthermore, high positions belonged also to Opole (15.7%) and Masovian (15.1%). A dissimilar situation was observed in Warmian-Masurian (4.4%), Lubusz (7.7%) and Greater Poland (7.7%). What is signifies is that the most favourable tendencies in this field were observed in Opole. The percentage of innovative service companies increased from 5.6% to 15.7% which resulted in the rise of 13 positions. A great decrease in this ratio, however, was noted in Lubusz which led to the fall of 11 positions.

Next to the scale of innovative activity, what is significant is the reflection in economic results of service companies. The analysis then comprised also change trends in the share of revenues from sales of new or significantly improved products in total sales (figure 1). In 2012 the ratio in question ranged from 0.2% in Opole voivodeship to 10.8% in Subcarpathian, however, it needs to be pointed out that in service companies the ratio exceeded even 35%. Two years later the influence of innovative activity on economic results in service companies was far smaller. The greatest level (6.1%) was recorded in Masovian voivodeship. Other positions in the ranking were occupied by: Subcarpathian (3.3%) and Lower Silesian (3.2%). The poorest results were recorded again in Warmian-Masurian and Opole. It needs to be emphsised that service companies recorded

significantly lower values of the ratio than economic subjects in industry. The situation was characteristic regardless of the region.

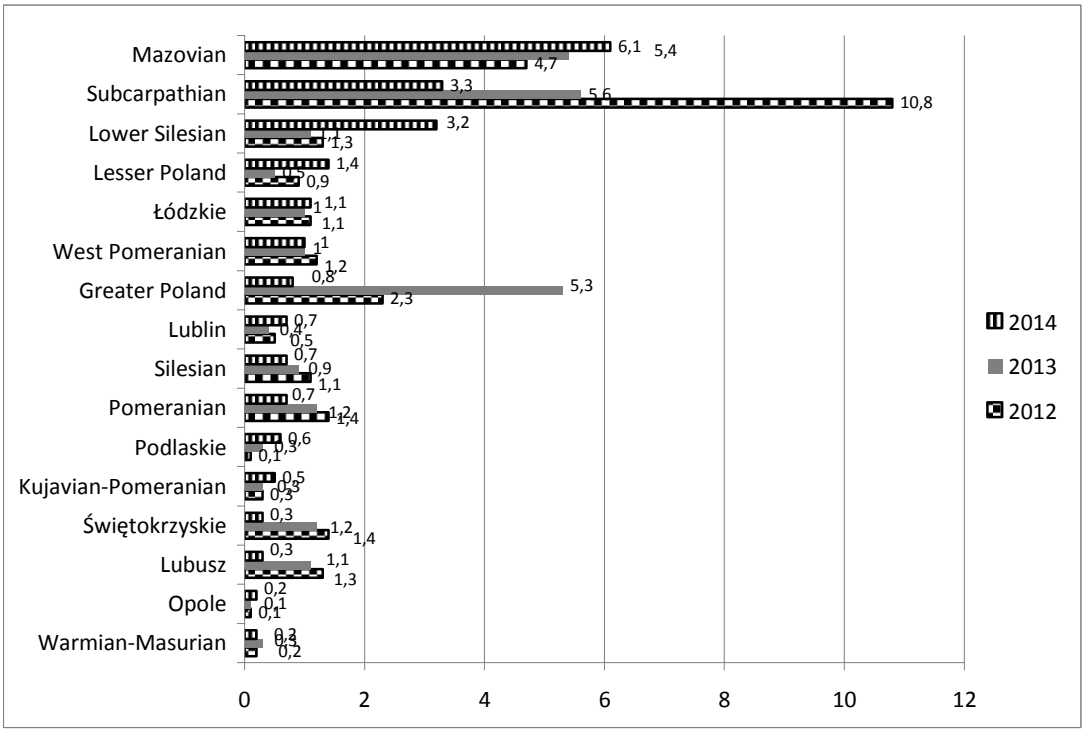

Figure 1. Revenues of service enterprises from sales of new or significantly improved products as the share of total revenues from sales in the years 2012-2014 by voivodships [%].

Source: own study on the basis of CSO reports – 'Innovation activities of enterprises' covering the years 2010-2014.

From the research it follows that regional diversity in financial outlays on innovative activity is considerable. In the timeframe of 2012-2014 the greatest outlays on innovative activity were borne by service companies from Masovian voivodeship (table 3). At the end of the analysed period the outlays exceeded the level of 8.3 billion PLN but they were lower by almost 25% than two years before. Other positions were occupied by Silesian (732.9 million PLN) and Lower Silesian (663.3 million PLN). The least funds on innovative activity were incurred by the voivodeships: Warmian-Masurian, Lubusz and Podlaskie. Service companies from these regions spent on innovative activity from a few to several million PLN. Unfavourable tendencies in this field were observed in Lublin voivodeship which led to the fall from the fifth to the tenth position (from 317.7 million PLN to 160.5 million PLN). Financial outlays of service companies were destined for the purchase of machinery and technical devices, research and development and marketing of new or significantly improved products. The tendency was upheld throughout the whole analysed period.

Table 3. Expenditures on innovation activities in service enterprises by voivodships in the years 2012-2014 (current prices in MLN PLN)

Voivodeship	2012	2013	2014	Change in the ranking 2014 – 2012
Masovian	11207.9 (1)	8893.0 (1)	8350.6 (1)	no changes
Silesian	937.6 (2)	517.8 (3)	732.9 (2)	no changes
Lower Silesian	no data	545.2 (2)	663.3 (3)	no data
Łódź	218.5 (8)	119.5 (6)	629.5 (4)	+4
Pomeranian	487.1 (4)	no data	590.4 (5)	-1
Greater Poland	300.1 (6)	263.5 (5)	482.6 (6)	no changes
Lesser Poland	639.9 (3)	431.6 (4)	435.5 (7)	-4
Subcarpathian	260.1 (7)	no data	433.9 (8)	+1
Kujavian-Pomeranian	no data	no data	322.5 (9)	no data
Lublin	317.7 (5)	57.1 (8)	160.5 (10)	-5
Świętokrzyskie	72.5 (9)	no data	53.3 (11)	-2
Opole	no data	27.2 (9)	51.8 (12)	no data
West Pomeranian	38.3 (10)	62.8 (7)	47.8 (1)	+9
Podlaskie	9.4 (12)	26.6 (10)	21.3 (14)	-2
Lubusz	18.9 (11)	13.2 (11)	12.4 (15)	-4
Warmian-Masurian	no data	9.1 (12)	7.0 (16)	no data

Source: own study on the basis of CSO reports – 'Innovation activities of enterprises' covering the years 2010-2014.

Table 4. Expenditures on innovation activities per one service enterprise which incurred such expenditures by voivodships in the years 2012-2014 (current prices in thousand PLN)

Voivodeship	2012	2013	2014	Change 2014-2012	Change in the ranking 2014 – 2012
Masovian	14518.1 (1)	11794.4 (1)	11208.8 (1)	-3309.3	no changes
Subcarpathian	3171.6 (5)	2660.3 (4)	5045.5 (2)	1873.9	+3
Pomeranian	3634.8 (3)	2767.0 (3)	4439.1 (3)	804.3	no changes
Łódź	1456.6 (11)	1182.9 (9)	3792.1 (4)	2335.5	+7
Kujavian-Pomeranian	287.5 (16)	3978.5 (2)	3707.5 (5)	3420.0	+11
Lower Silesian	2749.2 (7)	2234.4 (5)	3546.8 (6)	797.6	+1
Greater Poland	1744.9 (10)	1208.9 (8)	2666.1 (7)	921.2	+3
Silesian	4688.2 (2)	1703.4 (7)	2094.1 (8)	-2594.1	-6
Lesser Poland	2782.2 (6)	1926.8 (6)	1777.4 (9)	-1004.8	-3
Świętokrzyskie	2589.6 (8)	722.6 (10)	1238.5 (10)	-1351.1	-2
Lublin	3209.2 (4)	571.0 (13)	1049.1 (11)	-2160.1	-7
Opole	943.9 (12)	696.8 (12)	942.1 (12)	-1.8	no changes
West Pomeranian	890.6 (13)	721.8 (11)	637.5 (13)	-253.1	no changes
Lubusz	485.6 (14)	279.9 (15)	537.8 (14)	52.2	no changes
Podlaskie	314.1 (15)	532.4 (14)	519.7 (15)	205.6	no changes
Warmian-Masurian	2406.8 (9)	274.2 (16)	271.0 (16)	-2135.8	-7

Source: own study on the basis of CSO reports – 'Innovation activities of enterprises' covering the years 2010-2014

Taking into account the level of outlays on innovative activity per one service company once again Masovian voivodeship is the leader in the field (table 4). This tendency was upheld throughout the whole analysed period, however, there was a fall in the area by 10% to 11.2 million PLN. In the ranking from 2014 other positions were occupied by enterprises from Subcarpathian (5.0 million PLN) and Pomeranian viovodeships (4.4 million PLN).

The lowest results were recorded in the following regions: Warmian-Masurian, Podlaskie and Lubusz. At the end of the analysed period average outlays incurred on innovative activity amounted to: 271.0 thousand PLN, 519.7 thousand PLN and 537.8 thousand PLN. From the ranking it follows that the greatest rise was recorded in Kujavian-Pomeranian voivodeship (11 places). As regards the greatest fall (7 positions), however, it was observed in service companies in Warmian-Masurian and Lublin voivodeships.

Important information on the subject is derived from the analyses regarding regional innovation conducted by European Commission and published in the report entitled 'Regional Innovation Scoreboard'. The researched regions were divided into four groups: innovation leaders, strong innovators, moderate innovators and modest innovators. Regions of Poland were classified as members of one of the latter groups. From table 5 it follows that in the years 2004-2010 the best evaluated voivodeships there were: Masovian, Lubusz and Warmian-Masurian. It needs to be emphasized that innovative activity is one of the elements (next to enablers and outputs) influencing Regional Innovation Scoreboard, moreover, the results cover the years 2004-2010.

Table 5. Regional performance of innovation groups in Poland in the years 2008-2012

Voivodeship	2004	2006	2008	2010
Masovian	Moderate	Moderate	Moderate	Moderate
Subcarpathian	Modest	Moderate	Modest	Moderate
Pomeranian	Moderate	Moderate	Moderate	Modest
Łódź	Moderate	Modest	Modest	Modest
Kujavian-Pomeranian	Moderate	Modest	Modest	Modest
Lower Silesian	Moderate	Moderate	Moderate	Moderate
Greater Poland	Modest	Modest	Modest	Modest
Silesian	Moderate	Moderate	Modest	Moderate
Lesser Poland	Moderate	Moderate	Moderate	Moderate
Świętokrzyskie	Modest	Modest	Modest	Modest
Lublin	Moderate	Modest	Modest	Modest
Opole	Moderate	Modest	Modest	Modest
West Pomeranian	Modest	Modest	Modest	Modest
Lubusz	Modest	Modest	Modest	Modest
Podlaskie	Moderate	Modest	Modest	Modest
Warmian-Masirian	Modest	Modest	Modest	Modest

Source: Regional Innovation Scoreboard 2014, p. 49; http://www.technopolis-group.com/wp-content/uploads/2014/04/ris-2014_en.pdf

CONCLUSION

The following article has presented change trends in the level of innovation in Polish service companies allowing for the regional division. The analysis covered the years 2010-2014 and the primary sources of research material were the reports entitled 'Innovation activities of enterprises' published by the Central Statistical Office.

From the research conducted by CSO it follows that in the years 2010-2012 every fifth service company in Masovian voivodeships was innovatively active. Other places were occupied by: Kujavian-Pomeranian (16.5%), Lesser Poland (15.1%) and Lower Silesian (14.1%). The least innovative enterprises proved to be the ones operating in Warmian-Masurian, Opole and Podlaskie. In the years 2012-2014 the first three positions belonged to service companies from the following regions: Lublin (18.3%), Opole (15.9%) and Masovian (15.8%). As regards the industrial enterprises the first positions were occupied by: Lower Silesian, Silesian and again Lublin. The least innovative in this area proved to be the service companies from the regions: Warmian-Masurian, Lubusz and Greater Poland. In the sector of service companies the least innovative there were: Świętokrzyskie, Greater Poland and Łódź.

Taking into consideration the economic dimension of innovative activity that is the level of financial outlays incurred per one service company similarly the first place belonged to Masovian vioivodeship. The tendency was upheld throughout the whole analysed period, however, there was a fall in this area by 10%. In the ranking from 2014 other places were occupied by enterprises operating in: Subcarpathian and Pomeranian. The lowest results in this area were recorded in: Warmian-Masurian, Podlaskie and Lubusz. As regards industry, however, the greatest outlays in this field were noted in: Łódź (9.0 million PLN) and Lower Silesian (8.1 million PLN) and the least, though, – in Opole (1.6 million PLN).

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Barbara Kołodziej[2]

THE IMPORTANCE OF LIFELONG VOCATIONAL TRAINING FOR THE GROWTH OF INNOVATION AND COMPETITIVENESS OF ENTERPRISES

Abstract: The European Union Member States agreed on the importance of human capital: it is to be Europe's most important asset. The quality human capital is paired with the improvement in competitiveness, growth of action productivity while reducing the amount of work. The rate of education has been significantly improved in Poland, but in terms of the implementation of continuing vocational training we are not only in the group of countries with lower results, but even downward tendency is shown for these activities. Negligence in this regard correlates with the poor innovativeness of Polish companies, which in the context of gradual business development of other countries would be a bad prognosis for the future development of Poland.

Keywords: human capital, work efficiency, vocational training, statistics, innovation.

INTRODUCTION

In the 90s, entrepreneurship in the European Union member states has been characterised by the increase in labour productivity, with the decline in the number of hours worked [Berbeka 2007]. However, the EU member states have entered the XXI century with the weakening trend of the labour productivity growth, what was considered a problem by the Council of the European Union in 2005. As a result, it has been assumed that *Europe must renew the basis of its competitiveness, increase its growth potential and its productivity and strengthen the social cohesion, placing the main emphasis on knowledge, innovations and the optimisation of human capital* [the EU Council 2005], it has also been found that *the human capital is the most important asset of Europe* [Berbeka 2007]. These findings are reflected in the adopted strategic objectives, under which the Union agrees to support the member states in *developing their education and training systems, including the organisation of initiatives in the field of learning throughout the entire life, which ensure all members of the society with measures enabling the use of their potential* [Eurostat 2015]. In 2020, 40% of Europeans aged 30-34 has to hold the higher education, and the share of adults (aged 25-64) in education and training, is expected to reach, on average, 15% [Eurostat 2015].

Table 1. Participation rate in education and training of people aged 25-64.

Selected EU countries	2010	2011	2012	2013	2014
Poland	5,2	4,4	4,5	4,3	4,0
Czech Republic	7,5	11,4	10,8	9,7	9,3
Slovakia	2,8	3,9	3,1	2,9	3,0
Germany	7,7	7,8	7,9	7,8	7,9
Denmark	32,5	32,3	31,6	31,4	31,7

Source: own study, based on Eurostat 2015.

Poland belongs to the countries, which at the time of accession to the EU were to catch up a lot, both in terms of the level of education and the implementation of the lifelong learning. In 2002 (therefore, before the adoption of the EU membership), 9,8% of the Poles had the higher education, and 56,3% were people with secondary education, at most [Bagieńska 2013]. Less than 10 years later – in 2011, 23,5% of the Poles already had higher education [CSO 2013]. In 2014, the Ministry of Science and Higher Education announced that Poland has almost implemented the target set by

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the EU for 2020, so it raises the bar to the level of 45% of people at the age of 30-34 with higher education [MSHE 2014]. However, this success does not entail the expected changes in the second indicator, i.e., the implementation of the lifelong learning, understood, for example, as the *share of adults aged 25-64 in education and training*.

While the Danes (leaders in *education and training)*, generate the participation rate of approx. 32% (table 1), countries of the former Eastern Bloc achieve much poorer results: Romania has less than 2%; Slovakia 3,0. The highest rates in this group are achieved by the Czech Republic (from 7,5 in 2010 to 11,1 in 2011). Poland is among the countries, which have considerable difficulties with the improvement of the discussed indicator, but in recent years it even shows declining trends (from 5,2 in 2010 to 4,0 in 2014).

THE POTENTIAL OF THE CONTINUING VOCATIONAL TRAINING

The continuing vocational training is a special form of continuing education, defined as the actions and projects planned in advance related to professional training of employees, which are partially or entirely financed by the company [Grabara 2006, p.18]. This type of training is paired with a number of important functions, corresponding to the needs of the enterprise; as well as its employees. Companies pursuing the vocational training have the opportunity to:

- make improvements in their business and to increase competitiveness,
- safe planning of the innovative activity,
- verify workforce in the context of new tasks, derive from own human resources, proven in the previous activity
- obtain the best workforce, interested in employers who can invest in human capital
- derive from the growing loyalty of employees (as a result of investing in employees).

In turn, continual vocational training gives the employees the possibility to:

- improve the competence and to acquire new skills
- verify own capabilities in the implementation of new tasks
- increase self-esteem
- acquire new skills in carrying out tasks
- increase trust for the employer (in respect of his interest in the employees' improvement)
- increase employment security.

In total, the organisation can be adapted to the changes on the market and build its competitive advantage over other business entities /.../. The awareness of the executives is increasing of the great importance of employees' training for the company development [Konopka 2012, p.102] Therefore, employees are perceived by the staff not only as the production tool, but also as a human factor with a certain potential. The training activities also break the monotony, routine. Delegating the worker to the training, course or conference is usually perceived in terms of a reward for the employee. New energy and greater commitment to the implemented tasks accompanies the return to the place of work.

These benefits of the continuing vocational training are therefore worth the attention of entrepreneurs, but they are not necessarily associated with each training initiative. The coincidentally implemented training, not exactly relating to the company's business profile, to its prospective development directions or its needs, will not bring the expected results for the company. Only the proper training policy allows the conscious and deliberate impact on knowledge, behaviour and attitudes of employees [Konopka 2012, p. 105]. It is based on the precisely defined goals of the company, and not only on the current difficulties.

According to the regulation of the European Parliament and the Council of 2005 on the statistics relating to vocational training in enterprises [EC 2005], the activity of companies in the area of continuing vocational training is the subject of the obligatory monitoring in the EU, conducted every 5 years, since 2005 onwards. The subject of the research covers the costs, time and

accessibility to training financed in whole or in part by the companies. The forms of continuing vocational training include the pre-vocational training, internal and external courses, and other measures to increase the employee qualifications, e.g., participation in conferences, trade shows, training in the workplace and the planned self-education. Practically, these forms are divided in courses and other forms of training. Results of the monitoring allow us to get to know the implementation of continuing vocational training of individual countries, while the successive editions of the research allow the verification of the direction of changes [CSO 2010].

POLISH ENTREPRENEURSHIP AND CONTINUING VOCATIONAL TRAINING

In Poland, continuing vocational training in the form of *courses* was implemented by 34,7% of the studied companies in 2005, while 23,7% - *other forms* of training (table 2). Although in 2010 the number of *courses* was slightly higher, because of the greater number of companies, their corresponding percentage amounted to 20,4%. For *other forms of training* both the decrease in the numbers (more than 5 thousand), and the percentage (over 12 %) has been noted.

Table 2. Continuing vocational training in Polish companies in the years of 2005 and 2010

	2005		2010	
Companies	N	%	N	%
total	73337	100	91902	100
training	25491	34,76	20574	22,39
courses	17380	23,69	18826	20,48

Source: based on tab. 1(7), [CSO 2010]

Given the distribution of these forms of continuing training into their types, in 2010 entrepreneurs organised nearly 50% more *internal courses*, while the number of *external courses*, despite the increase of the total number of enterprises, is comparable to that of 2005 (table 3).

Table 3. Courses in companies in the years of 2005 and 2010

courses		2005	2010
total	N	17380	18826
	%	100	108,32
internal	N	7480	11026
		100	147,40
external	N	16512	16688
		100	101,06

Source: own study

Data describing *other forms of training*, show the reduction in numbers and percentage of all types of training (table 4), with the exception of the *planned learning through participation in science and quality clubs* (the number of initiatives included in these forms increased 7-fold in 2010). The largest negative differences relate to the *participation in conferences, workshop meetings, fairs and lectures*, and the *planned guided self-education* (both forms – decrease of more than 80%).

Table 4. Other forms of training in the years of 2005 and 2010

Year of the study		2005	2010
total	N	20081	13048
	%	100	64,97
planned training in the workplace	N	12146	7631
	%	100	62,82
planned learning through rotation, exchange, substitution	N	2794	2033
	%	100	72,76
planned learning through the participation in science and quality clubs	N	1338	9786
	%	100	731,39
planned guided self-education	N	2990	554
	%	100	18,52
participation in conferences, workshop meetings, fairs and lectures	N	14252	2390
	%	100	16,76

Source: own study

Apart from a smaller number of enterprises implementing the continuing vocational training, changes in the way and the quality of the organised courses and training take place: training organised in 2005 lasted longer than the ones organised in 2010. In terms of the participant, the average exchange rate in 2005 consisted of over 30 hours, and in 2010 - over 22 hours. The cost of this activity, in relation to the labour costs of companies is almost the same (0,87% and 0,86%), although the value of the employee training in 2005 was higher (1108 PLN in 2005; 860,5 PLN in 2010).

Table 5. Companies conducting training, the selected aspects

Year of studies	2005	2010
total in % of all enterprises	34,8	22,5
Including: enterprises conducting courses	68,2	91,1
other forms of training	78,8	63,1
Hours spent on courses in % of the total working time of enterprises conducting courses	0,6	0,7
Time of courses; the number of hours per 1 participant	30,1	22,2
Costs of courses in % of the working costs of enterprises conducting courses	0,87	0,86
The cost of 1 hour of the course (PLN)	36,76	38,7
Costs of courses per 1 participant (PLN)	1108,0	860,5
Enterprises conducting initial vocational training in % of the total number of enterprises	8,9	4,6

Source: own study

Already in 2005 it was shown that the implementation of *initial vocational training* is a rare practice, as they were organised by less than 9% of enterprises. In 2010, this percentage decreased by half (table 5). On the other hand, in the question concerning the reason for the non-implementation of continuing vocational training, in 2010 38,5% of the respondents indicated that *The enterprise focused on the initial vocational training, and not on continuing training*, while in 2005 this explanation was used only by 9,3% of the respondents (table 6). Also other explanations

(designed to explain the lack of implementation of continuing vocational training), in 2010 were selected more often than in 2005. And so:

- in 2005, 79,1 of the respondents, and in 2010 - 81,4% recognised that the *current qualifications and skills of the employed fully meet the needs of the enterprise;*
- in 2005 59,5% of the entrepreneurs, and in 2010 - by 69% it has been recognised that *the enterprise maintained the strategy of recruiting people at the appropriate level of qualifications;*
- in 2005 29,4% of the respondents, and in 2010 already 43,5% recognised that *the cost of training was too high for the enterprise;*
- in 2005 6,9% of the entrepreneurs, while in 2010 38,5% recognised that *the enterprise invested in training in the previous years and there was no need to invest in training*
- in 2005 10,1% of the group, and in 2010 - 24,4% indicated that *the employed personnel had no time to participate in training*.

Table 6. Explanations of entrepreneurs who do not conduct continuing vocational training

Reasons for the resignation of continuing vocational training	**2005**	**2010**
existing qualifications and skills of the employed fully meet the needs of the enterprise	79,1	81,4
the enterprise has maintained the strategy of recruiting people at the appropriate level of qualifications	59,5	69
the enterprise had difficulties in assessing its training needs	3,1	8,9
lack of the proper training offer on the market	5,7	10,4
the cost of the training was too high for the company	29,4	43,5
the enterprise focused on the initial vocational training, and not on continuing training	9,3	38,5
the enterprise invested in training in the previous years and there was no need to invest in training	6,9	15,9
the employed staff had no time to participate in training	10,1	24,4
other reasons	33,9	24,2

Source: own study

The summary of the results of both studies (table 6), therefore, shows that entrepreneurs take more arguments for the lack of implementation of continuing training. However, the indicated factors seem to contradict themselves (e.g. hiring employees at the appropriate level of qualification and the lack of the proper training offer or the lack of time of the personnel for training). Therefore, numerous arguments result from the strengthening of the adopted position. It is possible that the current interpretation (recommending continuing vocational training) is a true challenge for the studied entrepreneurs, however, they cannot take is consciously. They probably have the success in mind, which they have to work out in the growing competition, as evidenced by the increase in the number of business entities (in 2010 the number of companies increased by 25%). Also the number of hours of the Polish enterprises increases (calculated in working hours of the enterprise and hours per one employee): in 2010 one employee had 16 hours more than in 2005. The actual number of working hours in a week in Poland is one of the highest in Europe: according to the data of 2012, employees in Polish enterprises worked 39,4 hours, and higher rates characterised only 3 countries: Bulgaria - 40,1 hours; Czech Republic - 39,9 hours; Slovakia 39,5 [Kłos 2013, p. 57–96]. The significant growth also applies to the labour costs: compared to 2005, in 2010 the labour cost of one employee was nearly 36% higher.

Table 7. Time and cost of labour in enterprises in 2005 and 2010

Work time	in m h	%	per 1 employee	%	in m PLN	%	per 1 employee	%
2005	8671,8	100	1659	100	176980,2	100	33860	100
2010	10319,2	118,9	1675	100,9	283634	160,2	46049	135,9
growth	1647,4	18,9	16	0,9	106653,8	60,2	12189	35,9

Source: own study.

ELITE INNOVATION

The increase in the number of companies illustrates the development of entrepreneurship, although referring to the previously quoted comments concerning the European vision of development, the greater labour efficiency is desired[3]. Meanwhile, in this respect, in contrast to the working time, Polish enterprises achieve results below the European average. Therefore, the huge effort of the Polish entrepreneurs and employees is inadequately reflected in their successes and gratuities, and since the increase of the number of working hours is the only weapon in the fight for better results, these successes are also questionable in the future. The labour productivity growth requires innovation or additional motivation of employees. Both are associated with training, courses or other forms aimed at the improvement or increase of the qualifications. Thus, their abandonment is the resignation from the currently necessary, gradual development of the company.

Table 8. Innovation activity of enterprises

enterprises	2005	%	2010	%
Total	73337	100	91902	100
Introducing products/innovative services	11123	15,2	7940	8,6

Source: study based on the table ***Enterprises, which introduced new or significantly improved products, services or methods of production or provision of services.***

Innovative companies in Poland in 2005 constituted 15,2% of all enterprises, while in 2010 – 8,6% (table 8). Among the companies involved in continuing vocational training, the percentage of innovative companies is higher, while its height depends, among others, on the detailed forms of continuing vocational training. And so, in 2005, the companies pursuing education in the form of *courses*, were innovative in 27,6%, while the implementers of *other forms of training*, every third company was innovative (32,6%). In 2010, the percentage of innovative companies among the implementers of *courses* was lower (22,3%), while among the companies pursuing other forms of training – it increased to 33,7%.

The mere innovation also correlates with the research and development activity, which rates include, among others, company expenditure on its implementation. In the PARP studies it has been shown that the expenditure was gradually lower in the past years: in 2010 10,3%; in 2011-9,7%, in 2012 – 3,8%, while in 2014 – only 1,4% [PARP 2015].

Therefore, in total, both the data on continuing training and the R&D activity explain that Polish companies are not innovative, as they do not accept the so-called innovation strategy. The previously quoted CSO study results, presenting the opinions of entrepreneurs on the reasons for the

[3] understood *as the gross addend-value expressed in euro at basic prices per employee*

non-participation in *courses and in other forms of continuing training*[4], prove the adoption of "defensive" attitudes, set to survival. Innovation does not fir in this vision, it is not perceived as a challenge or an opportunity for development and it is not perceived like this, but Polish companies cannot afford it.

Table 9. Implementation of continuing vocational training and innovation

year		2005		2010	
Form of training		total	Innovative	total	Innovative
Conducting courses	N	17380	4805	18826	4195
	%	100	27,6	100	22,3
Conducting training	N	20081	6543	13048	4394
	%	100	32,6	100	33,7

Source: own study

A reflection on the state of the Polish entrepreneurship is undertaken, among others, by authors of the report of the Polish Agency for Enterprise Development [PARP 2015]: *What is happening in the Polish companies that the innovation, which today is unambiguously associated with the maintenance of competitiveness, finds it difficult to pierce the consciousness of the management and the activity of enterprises?* – they ask. As it has been further stated, innovative companies, spending more and more resources on the research and development activity, quickly achieve results, which can compete with the western countries. *Then, why does innovation remain an idea for most companies, which is not adopted to their business practice?* In the longer term, this situation will result in the increase of differences between the Polish and Western entrepreneurship. Although the PARP report assumes the optimistic scenarios, according to which: *business strategies of companies will have to go hand in hand with innovation strategies, and they will de facto be adjusted to the latter*, however, this will apply only to the strongest companies, while the future of the others remains questionable.

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Eugeniusz Kośmicki[5]

THREAT TO BIODIVERSITY AS A CHALLENGE FOR GLOBAL GOVERNANCE

Abstract: Preservation and sustainable management of biodiversity is a major challenge both for science and practice. The term biodiversity refers to the diversity of species, diversity of living space and genetic diversity within individual species. Contemporary extinction of species, destruction of ecosystems and loss of genetic diversity are becoming catastrophic. Protection of biodiversity and its sustainable management need to be considered an important element of sustainable development and thus countering the contemporary global risk society. The so-called hotspots are particularly threatened. Preservation and sustainable management of biodiversity also constitute the foundation for the maintenance of evolution processes, and thus further survival of the biosphere and humanity. This is the objective of the concept of global governance.

Key words: biodiversity, globalization, hotspots, global governance, sustainable management of biodiversity.

INTRODUCTION

In view of the global ecological and economic crisis the preservation and sustainable management of biodiversity is the primary challenge faced by humanity. The term biological diversity, or biodiversity, refers to the diversity of species, diversity of living space and genetic diversity within individual species [Flasbarth, 2008, p. 45]. To date biodiversity has not been the subject of comprehensive research in terms of sustainable functioning of the society and economy. At present we have been observing rapid extinction of whole groups of plants and animals. According to the generally accepted opinion, *"extinction is taking place at a much greater pace, much faster than it was before the advent of humans. In many cases the rate is catastrophic: whole groups are threatened*" [Wilson, 1992, p. 322]. What is more, reduction of biodiversity leads to a reduced quality of ecosystem services. For this reason: "*Ecosystem services are the most important requirement to ensure human welfare (…). It is an illusion that humans might live in comfort in a biologically depleted world*" [Wilson, 1992, p.322]. This paper discusses contemporary economy in view of global threats to the environment and selected major biodiversity issues. It is characteristic that: *"We devote much less attention to the destruction of biological diversity of the living world than we do to climate change, depletion of non-renewable resources or other transformations of the physical environment"* [Wilson, 2014, p.352].

ENVIRONMENTAL THREATS IN VIEW OF GLOBAL ECONOMY

A characteristic feature of contemporary societies and economies is connected with processes of increasing globalisation. It means that all countries, despite considerable diversification, are forming an increasingly uniform socio-economic and ecological entity. This leads to the final extension of social interdependencies of economic activity beyond national borders, reaching global dimensions. At the same time the global ecological crisis is deepening, affecting profoundly the condition of the natural environment. The only solution may be provided by the global implementation of sustainable development and global governance. As it was stated by W.E. Rees: "*In order to achieve ecological sustainability and at the same time reduce socio-economic disparity international cooperation is needed on an unprecedented scale. It would also be a step towards cultural evolution of mankind*" [Rees, 2004, p.3]. We are currently found at the turning point in

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history, since the ecological boundaries for economic development require a profound change in the previously prevalent social and economic paradigm.

In the global economy the natural environment is becoming rapidly degraded due to the huge increase in the production volume and anthropopressure. H. Károly thus characterised the current situation: "*While politics and science strive to specify objectives of sustainability, engineers and entrepreneurs are developing new technologies neglecting environmental effects and causing a flux of environmental hazards*" [Károly, 2001, p.16]. Along with the development of global economy we have been observing a rapid acceleration of environmental degradation. The scope of this degradation may be stated based on a synthetic compilation by J. R. McNeill, who presented the 20th century history of environmental degradation [McNeill, 2000, pp. 31,54,121,247]. (Table 1).

Table 1. Selected parameters of global environmental degradation in the 20th century

Characteristics	Acceleration factors from 1890 to 1990
World population	4
Industrial production	40
Energy consumption	13
Air pollution	~ 5
Carbon dioxide emission	17
Sulphur dioxide emission	13
Lead emission to the atmosphere	~ 8
Water consumption	9
Marine fish catches	35
Population of blue whales	0,0025 (decrease by 99,75%)
Arable land	2
Forested areas	0,8 (20% decrease)

Source: J.R. McNeill, [2000, p.360].

Global economy has been developing rapidly, leading to numerous ecological, social and health hazards and thus creating the global risk society [Beck, 2000]. Contemporary globalisation continues to be solely economic, while economic competition leads to many adverse economic, socio-cultural and ecological phenomena. For example, it may be stated that "*the normal rate of extinction (…) is one species per one million species annually. Human activity has accelerated the rate of extinction from one thousand to 10 thousand over that level and it was only in rainforests (…). We are obviously experiencing one of the great extinctions in geological history*" [Wilson, 1992, p.356].

In the case of the global risk society a great importance needs to be attributed to the concept of sustainable development based on the principles of generational equality, international fairness, prevention, nature's inherent right for protection, environmental harmony, recognition of social and legal democracy. Neoclassical environmental economics has not been capable of

slowing environmental degradation. Thus ecological economics has developed as a criticism of previous economic assumptions. A combination of basic assumptions of ecological economics and neoclassical environmental economics – as a specific synthesis – has resulted in the development of sustainable economics [Rogall, 2010].

SELECTED ASPECTS OF BIODIVERSITY

At present we are experiencing a rapid rate of species extinction. A question we are facing is what the rate of species extinction would be under natural conditions with no anthropopressure present. Based on fossil series it may be stated that individual species exist for approx. 1 to 10 million years before they die out or before new species develop [Baur, 2010, p.98]. Assuming that at present there are 10 million species, one to ten species would naturally become extinct as a consequence of natural factors. The extinction rate currently observed among birds and mammals is 1% per 100 years, i.e. it is 100- to 1000-fold greater than otherwise possible based on natural data [Baur, 2010, p.98]. This increased extinction rate is a consequence of human economic and social activity.

The primary causes of contemporary extinction of species include the destruction and alteration of natural habitats caused by population growth and increased consumption of natural resources per capita. Destruction of a tropical rainforest, together with its inherently high biodiversity, has become a symbol of threat to species diversity. Considerable species losses may be attributed to the intensification and mechanisation of agriculture as well as the expansion of residential and industrial areas. Due to various non-natural areas and linear traffic structures, such as streets, motorways or railways, previously interconnected areas are becoming not only smaller, but also separated. Landscape fragmentarisation limits or even prevents exchange between populations and recolonisation of specific areas. Apart from water and soil pollution, biodiversity is also depleted due to excessive consumption of natural resources (overhunting, excessive herb collection, overfishing).

Although global population growth has slowed down in the last 10 years and in some industrialized countries is approaching zero, it remains high in many regions of tropical Africa, Latin America and Asia, which at the same time are regions of the greatest biodiversity. Pressure on biodiversity is increasing as a result of the need to satisfy basic human needs, to provide food, water and shelter. Global consumption of natural resources has been growing in recent decades at a faster rate than global population, since requirements of individual consumers have increased. For example meat production per capita increased from 18 kg in 1950 to 36 kg in 1990. Another well-known example is paper consumption per capita in developed countries, which increased from 70 kg in 1961 to 158 kg in 1998. In the same period paper consumption grew also in developing countries from 2 kg to 18 kg [Baur, 2010, pp.52-54].

Biodiversity is not uniformly distributed throughout the world. Both on land and in freshwater and marine environments there are areas with very high species diversity. Several regions are characterised by particularly high species diversity and a large number of endemic species. These global biodiversity hotspots account for as little as 2.3% Earth's surface, at the same time comprising approx. 50% all known plant species and 42% species of amphibians, reptiles, birds and mammals. Such ecosystems with exceptionally high species diversity include e.g. coral reefs, mountains and dry grasslands. Knowledge on the spatial distribution of biodiversity is a crucial indicator for planning and allocation of means for its protection [Myers, 2000, pp.853-858]. The concept of global biodiversity hotspots has been repeatedly updated and corrected. The latest list presented in 2005 gives 34 hotspots.

Most hotspots are found in areas with population densities much higher than average. For example, the Philippines, Japan, the Western Ghats and Sri Lanka have population densities of over 250 inhabitants per 1 km^2. In many hotspots population growth rates exceed the average population

growth rate worldwide. Such a high population growth is placing great pressure on the still existing hotspots. A significant problem for the preservation and appropriate management of biodiversity is connected with adequate scientific knowledge. Scientists report a lack of awareness on the importance and threats to biodiversity among politicians, administrative agencies and business circles. The importance of biodiversity needs to be adequately appreciated in research policy and support for specific research institutions.

BIODIVERSITY AND THE CONCEPT OF GLOBAL GOVERNANCE

The current system of international institutions developed after WWII and it focused on problems and potential of that period. The most important task originally attributed to the United Nations was to prevent international conflicts, which in the 20th century led to two world wars and potentially threatened with the outbreak of another world war. To date no major international discussion has been initiated on the necessity to develop new regulatory models for economy on the international or global scale (apart from the problem of economic integration). Such an attempt to overcome international problems is provided by the current concept of global governance. In 1989 on the initiative of W. Brandt the Commission on Global Governance was established, which in 1995 published the Report entitled *"Our Global Neighbourhood*" in an attempt to present major problems of global neighbourhood in more detail [Nasze…, 1996]. Since that time a lively scientific and political discussion has been conducted. Regulation of globalisation processes refers to such basic problems as world peace, global trade organisation, international competitiveness, the world currency and financial system, global development, the world social system and global ecology.

At present 600 multilateral international agreements are in force, binding on the power of international law and concerning environmental protection. We also have 50 to 80 international ecological regimes, i.e. specific, definite principles, standards, procedures and programmes concerning interactions of entities within strictly specified areas of the environment. Currently new, the so-called flexible international instruments of environmental protection are being implemented, i.e. international emission fees, the institution of joint implementation and international emission certificates, subject to trade. So far environmental protection has not been adequately represented even within the UN. Although the UN Environmental Program has been in place already since 1972, it does not have the character of a specialised organisation [Biermann, 2015, pp.107-114].

We need to consider the following scopes of ecological order: the ozone layer protection policy, the climate protection policy, the biodiversity and forest protection policy, soil and water protection policies, the material resource policy and waste management policy as well as global epidemiological threats.

Ecological theories also in relation to biodiversity still comprise certain fixed opinions, which may be referred to as myths. We may mention here four such basic myths, i.e. the **myth of balance of nature** – all ecological units at the absence of human interference are found in the state of equilibrium or approach this state; the **myth that only humans disturb the existing equilibrium,** which is refuted by the occurrence of natural disasters in the history of the Earth as well as the human protective activities leading to a specific condition of nature, **the myth that nature is a perfectly operating machine**, i.e. the Cartesian-Newton understanding of nature as well as a simplified cybernetic feedback mechanism within the theory of ecosystems, **the myth that nature is a global living organism**. The above-mentioned myths have been questioned by contemporary life sciences. As a result of criticism of previous ecological concepts contemporary knowledge has developed, based on new ecological concepts.

Table 2. Basic elements of ecological global governance

Elements of global governance	Examples
International conferences	Conference in Stockholm (1972) Conference in Rio de Janeiro (1992) Conference in Johannesburg (2002)
International reports	Brundtland Report (1987) Our Global Neighbourhood Report (1995)
International conventions and protocols	Approx. 600 international conventions Framework Convention on climate change Convention on biodiversity
Legal regimes	Approx. 50-80 regimes, e.g.: climate protection water protection soil protection
International institutions	UN Environmental Program (UNEP) Commission on Sustainable Development (CSD)
new regulatory instruments	International emission fees Joint implementation

Source: The author's study.

It comprises the following characteristics of animate nature, particularly in terms of biodiversity:

- Ecological systems are not absolutely stable or in the state of equilibrium, being dynamic instead;
- Disturbances in the structure of ecosystems occur also with no human interference, as a result of dynamic natural processes;
- To a considerable extent ecological systems exhibit a certain dynamic, phenomena occurring in nature are stochastic in character, and as such they are difficult to diagnose;
- Ecosystems do not have characteristics of living organisms and their internal structures and self-regulation continue to be investigated by science, since many problems remain unclear;
- Processes connected with the occurring changes are natural, or even necessary and have a positive effect on the maintenance of the biosphere as a whole;
- Evolutionary biology and ecology contribute to the explanation of causes for biodiversity, while evolution as the history of life on Earth also indicates a global perspective for the preservation of biodiversity;
- moreover, humans have to avoid excessive exploitation of the natural environment (as indicated by the carbon footprint) to prevent ecological losses;
- species are elements of natural communities and complex interactions occur between many species;
- biodiversity facilitates the satisfaction of human needs and provides us with the experience of freedom, constituting a value which specifies human needs in the positive sense.

The Earth Summit in Rio in 1992 was of great importance for the discussion concerning biodiversity. The UN Convention on Biological Diversity (CBD) was signed in 1992 in Rio de Janeiro and it has been ratified by most countries, including the European Union. CBD is currently

considered the basic international convention on the protection of biosphere. It reflects the primary change in the paradigm on biodiversity protection followed since the 1980's. The only currently binding protocol on the potentially safe handling and transfer of genetically modified organisms (GMOs) was adopted in 2000. It is the Cartagena protocol on biological safety.

For the protection of rare and endangered plant and animal species a tremendous role has been played by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), also called the Washington Convention. Other conventions concerning nature conservation and biodiversity preservation include the Ramsar Convention (protection of wetlands e.g. as habitats for wetland birds) and the Bonn Convention (on wild migratory animal species). National legal acts are also crucial for the protection of biodiversity, such as e.g. the US Endangered Species Act, or the national Red Lists. The European Union is also active in enforcing nature conservation, with the greatest role played by the Natura 2000 Programme as well as the Habitat and the Birds Directives. Within the EU the status of amphibian, migratory fish and butterfly populations, moss species, as well as marine, coastal, moor and freshwater habitats is particularly disturbing [Biermann, 2015].

Numerous countries have implemented their own categories of protected areas, partly independent of IUCN. Large protected areas, such as national parks, are crucial for the maintenance of biodiversity. In Central Europe most national parks belong to IUCN. For a specific species to be preserved over a long period they need to cover many populations. Biosphere reserves play a particularly significant role among the various categories of protected areas. Within the UNESCO Man and the Biosphere programme (MaB) reserves have been established in order to use the living space and maintain biodiversity. Biosphere reserves are extensive landscapes of national importance covering specific areas [Simonis, 2003, p.39].

CONCLUDING REMARKS

The primary objective of biodiversity protection seems to be the maintenance of natural processes and thus further evolutionary development, including the formation of new species. An important objective for our activities is to preserve extant plant and animal species, their communities within the natural selection conditions, as well as protect genetic variability within species. Anthropopressure currently involves such forms and scopes that the natural evolutionary process itself is becoming threatened, in turn posing a risk for the historical socio-economic development of mankind, with humans becoming a true geological force. Global economy generates tremendous degradation of the natural environment, loss of biodiversity and unsustainable use of natural resources. These changes are frequently irreversible, threatening the foundations of life on Earth and resulting in an extreme situation for the biosphere and anthroposphere.

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PRODUCTIVITY OF PINE WOOD CONVERSION AS A FUNCTION OF THE COST OF RAW MATERIAL AND THE ASSORTMENT OF PRODUCTS

Abstract: Studies on productivity of coniferous assortment are directly linked to the assortment structure of manufactured finished products or prefabricates. Technological process often determined by the size of sawmill is also significant. The article shows the direct influence of the type of selected raw material on lowering the costs of the production of selected assortment of prefabricated sawn wood and the sawn wood in general, packaging, pallets and elements of garden architecture. The relation between productivity and the level of efficiency of conversion has been presented. The study was carried out for various enterprises depending on the type of their final products.

Key words: sawmill industry, pine wood, efficiency, productivity.

INTRODUCTION

The development of wood industry and the global volume of wood conversion mainly depend on the potential and volume of domestic resources. Structural changes within wood industry caused an increase in harvesting annual merchantable bole in Poland from 20 million m^3 in the 90-ties to over 37 million m^3 now (Lasy w liczbach 2015). Mechanical conversion, including sawmilling (large and medium-size wood), utilizes 12 to 15 million m^3 of roundwood. Raw material conversion in sawmilling industry is characterized by a wide variety of products related to market needs both domestic and even more so expectations of the common EU market. (Gotych et al. ,2019, Hruzik et al. 2000, 2004).According to Polish Statistical Classification of Economic Activities (Polska Klasyfikacja Działalności (PKD) carried out by Central Statistical Office GUS (2015), the number of enterprises specializing in the production of wood and wooden products (including sawmill products, panels, plywood, veneers, carpentry and joinery products, packaging, products made of cork and wicker – excluding furniture) amounts to over 20 thousand, within that number 8200 are the recipients of roundwood [Lis 2008a, 2008b].

Table 1. Structure of sawmilling enterprises in Poland based on raw material purchases

Volume of conversion [thousand m^3/year]	Number of enterprises
<10	about 3000
10-24	about 100
25-99	42
100-249	31
>250	8

Source: own elaboration based on the data provided by National Forests 2015, Rynek Drzewny 2015)

The structure of sawmilling enterprises in Poland, determined based on the purchases of raw material was shown in table 1, which indicates that Polish sawmill industry is dominated by enterprises with annual conversion up to 10 thousand m^3 (about 3 000 companies) about a hundred

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enterprises convert from 10 to 24 thousand m^3 while the recipients of over 100 thousands m^3 of raw material constitute a group of 25 enterprises.

According to the criteria of Central Statistical Office the biggest dynamics of development is characteristic for the structure of those enterprises within sawmill industry which employ up to 200 employees. The group of those enterprises definitely dominates among the producers of sawmill goods. There is a similar situation in Germany (Dietz and Krzosek 2009). According to the data provided by EWD Sägetechnik the number of sawmills converting up to 30 thousands m^3 of wood oscillates around 2 000 and there is a steady decrease in this number. It has to be stated that in the EU contrary to Poland there are industrial complexes with annual conversion between 0.5 and 1.5 million m^3 of raw material.

METHOD OF DEFINING PRODUCTIVITY

Conversion of raw material into sawn wood and sawn products depends on a few production and market factors. (Hruzik 2003). The development of this industry is conditioned by the following factors:

- Introduction of ISO 9000, which regulate systemic implementation of production quality,
- Using PN-EN standards concerning raw material and sawmill products
- Using raw material with COC/SFC certificates

Within an enterprise among the main factors determining economic effects are the conditions of purchasing raw material by various companies. Analysis of this problem in relation to the whole sector [Gotych et al. 2009, Hruzik 2006, Ratajczak, Bidzińska, Szostak, Herbeć 2011] cannot be isolated from the current structure and assortment of sawmill production in Poland. Studies of that problem carried out based on the number of different sawmills [Hruzik et al. 2000] show that technological efficiency of wood conversion is here of fundamental significance. E_p is a synthetic technical efficiency ratio of roundwood conversion into sawn wood and sawn products, expressed in natural numbers or percentage, defined as a sum of product value (of sawn wood and other sawmill products as well as chips and sawmilling by-products) obtained from a given raw material, related to the cost of purchase of raw material vital for their production. [Hruzik et al. 2000, 2004, Hruzik 2010, Lis 2011], described by the following formula:

$$E_p = \frac{\sum V_w C_w + \sum V_z C_z + \sum V_o C_o}{\sum V_s (C_s + T_s)} * 100\%$$

where:

V_w – volume of products of conversion for domestic and european market,
C_w – unit prices of ready-made products,
V_z – volume of chipped raw material,
C_z – conventional conversion chips price,
V_o – volume of residue and sawdust,
C_o – conversion price of residue and sawdust,
V_s – volume of raw material,
C_s – conventional raw material price,
T_s – cost of raw material transport.

With a ratio defined this way and the assumption that production assortment and raw material selection for certain products quality and dimension-wise is in line with developed standards one needs to pay attention to two elements, namely:

- Cost of raw material used for conversion,
- Production assortment.

Raw material for sawmill conversion, depending on its normative and commercial features has a certain price. Simultaneously, when purchasing raw material: loco las one has to take into account the cost of its transport to the place of its conversion. When this distance grows there is an increase in the cost of raw material. It's well known that in certain circumstances there is a limit to the distance from which raw material may be transported beyond which its purchase is economically sound.

Productivity E_p may also be determined as a sum of partial efficiency for individual products [Hruzik 2010, Lis 2011] obtained at a given plant from raw material conversion:

$$E_p = E_p(w) + E_p(z) + E_p(o) + ...$$

or

$$E_p = E_p(t_g) + E_p(t_b) + E_p(z+o)$$

where:
t_g – main sawn wood,
t_b – side boards,
z+o – other forms of products (briquettes, pellet ...).

Productivity of wood conversion and manufacturing certain sawmill products has to be analysed taking into account material efficiency ratios, as well as current prices of certain products determined at contract level. (Rynek Drzewny 2015).

Following accession of Poland to the European Union and a significant expansion of sawmill products onto the European market, product prices calculated in Euro as well as current conversion rates have had a strong impact on the production efficiency.

PRODUCTIVITY OF PINEWOOD CONVERSION

Study of productivity of certain assortment of sawn wood, packaging, pallets as well as elements of garden architecture has been shown in table 1.

Table 1. Results of the study on efficiency and productivity of pinewood conversion into various products

Type of raw material (quality class)	Assortment - product	Study results – figure number
Large-size material WC0	Edged sawn timber	2
Medium and large-size material S2b/WC0	Edged packaging and pallet elements	3
Medium and large-size material S2b/WC0	Elements of garden programme	4
Medium and large-size material W(C)	Garden architecture	5

Source: own-elaboration

Raw material conversion was carried out at well-equipped sawmills specialized in a given type of production (small and medium enterprises). An individual selection of logs was applied when executing orders. The results of industrial studies in a form of a volume of conversion and obtained

ratios of material efficiency and productivity of certain assortments of sawn wood and manufactured products were show in figures 1 to 4.

Figure 1 shows comparative material efficiency and productivity of edged sawn wood in a form of boards and planks of various sizes produced at one sawmill. Productivity ratio of sawn wood sold on domestic market at efficiency level between 47–65% oscillated within the range 142% and 215% (level of raw material and finished products prices from 2015). The lowest efficiency and productivity was found in case of the thinnest sawn wood, while the highest (215%) for the scantlings. Which suggests that the technological results and productivity of logs conversion from large-size wood, class: WC0 vary considerably (ΔW=18% and ΔE_p=72,5%).

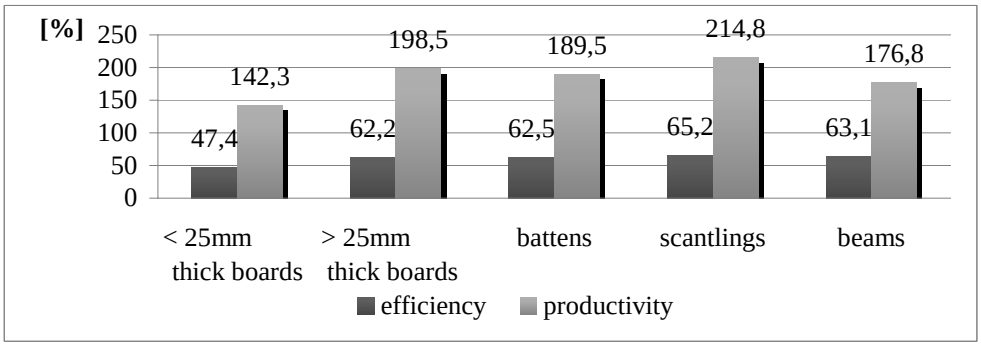

Figure 1. Impact of edged assortment of pine wood on the average efficiency and productivity (price level 2015)

Source: own-elaboration

Average technological ratios of the conversion of top logs from large-size wood (50% class W(C)) and medium-size material (50% billets S2b) into elements of packaging and euro-pallets (prices of both raw material and products from 2015) presented in figure 2. Material efficiency between 58% and 63% for various elements guarantees conversion productivity from 100,7% to 156,7%.

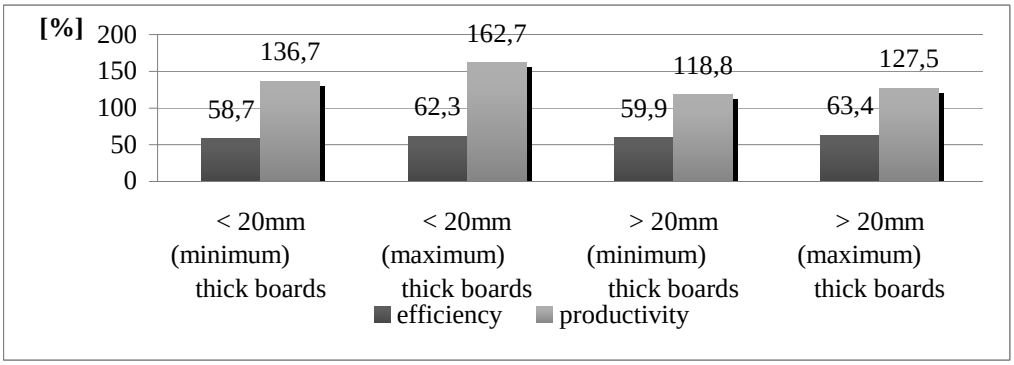

Figure 2. Average efficiency and average productivity of medium and large-size pinewood conversion into various sawn wood assortment of packaging and pallets (price level 2015)

Source: own-elaboration

Very low conversion productivity (118%; 137%) indicates that thin edged elements are obtained with efficiency only slightly exceeding the cost of raw material. Therefore their production is desirable only when they are manufactured along such elements which guarantee higher productivity level. The analysis that was carried indicates that despite high material efficiency production of elements of packaging and pallets is characterized with a varied level of productivity.

Examples of technological ratios of conversion of medium and large-size raw material into elements of garden architecture were shown in figures 3 and 4. Sawmills in which the analysis was carried out belong to a group of medium-size enterprises, which production is targeted at European market. Each time logs (billets) for the production of certain elements are selected using diameters optimal for a given type of sawmilling.

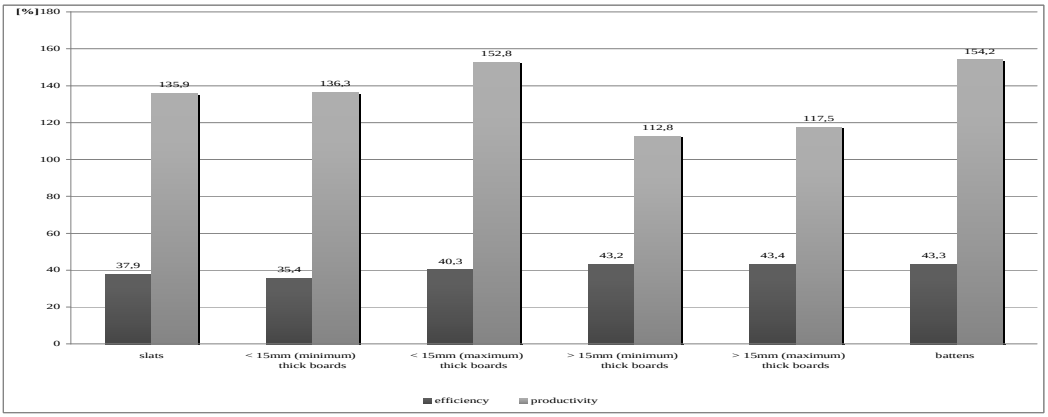

Figure 3. Average efficiency and productivity of conversion of medium and large-size pine wood into elements of garden programme (price level 2015)

Source: own-elaboration

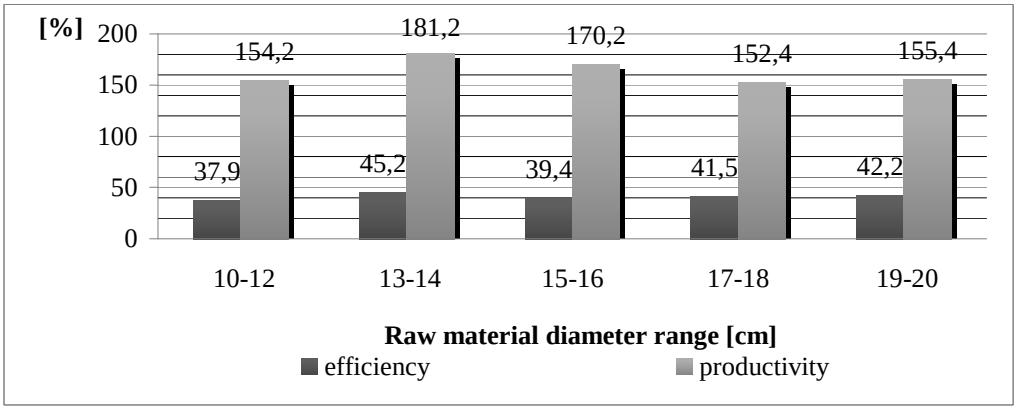

Figure 4. Average material efficiency and average productivity of medium and large-size pine wood conversion into the elements of garden programme (price level from 2015)

Source: own-elaboration

Figure 3 presents efficiency and productivity manufacturing slats, battens and boards accounting for the level of prices from 2015. Converting billets and thin logs allows for efficiency level between 35% and 43% at productivity between 112% and 154%. Production assortment has a decisive impact on the final effect of conversion. Similar results were obtained when comparing conversion of billets and thin logs (figure 4) into the elements of garden programme for the level of prices from 2015. In this case efficiency oscillated between 37% and 45%, while productivity from 152% to 181%.

Ratios presented in figures 3 and 4 are much lower than ratios determined for various assortments of edged sawn wood produced in 2015. This indicates that the level of productivity of certain sawmill products due to the prices of domestic raw material at a rather stable (or slightly decreasing) prices of finished products, shows a downward trend and for sawmills is a negative phenomenon.

CONCLUSIONS

1. Cost of raw material in sawmill conversion with stable and competitive prices of finished products has a direct impact of sawmills' level of productivity regardless of the type of assortment.
2. Productivity of mechanical processing into sawn wood and certain sawn goods depends on the assortment being produced at a given enterprise. Productivity of conversion of medium and large-size pine wood, analysed at sawmills of different profile in 2015 ranges from about 30% to 72%. This indicates the rule that sawmill economic results are mainly determined by the assortment of production.
3. Prices of purchased raw material and manufactured products influence efficiency of sawmill conversion. Changes in productivity ratio objectively indicate deteriorating situation in sawmill industry what is confirmed by the results of analysed cases for various assortments depending on the character of final production.

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Wojciech Lis[8]

ASSESSMENT OF THE STRATEGY TO PURCHASE TEN-YEAR PENSION BONDS TO BE DEPOSITED IN AN INDIVIDUAL RETIREMENT ACCOUNT (IRA) – BONDS

Abstract: The study will assess different strategies of purchasing ten-year pension bonds to be deposited in individual retirement accounts (IRA). Ten-year pension bonds are purchased and serviced by means of the IRA-Bonds. The study will prove that among different investment strategies, in January each year it was the most profitable to purchase a set of ten-year pension bonds issued between 2004-2014 and 2007-2017. Apart from bonds purchased in January, successive, monthly purchasing of a proportional part of the specified limit of securities was also worse than in bonds purchased in February, September and May. The study assessed the profitability of the ten-year pension bonds investment strategy.

Key words: pension bonds, individual retirement account

INTRODUCTION

Ten-year pension bonds of the state treasury were first issued in October 2004. They are part of the third pillar of the Polish pension system. Having been on the market of individual retirement accounts (IRA) for about 13 years, we can say that apart from the interest margin and interest rate, the profitability of these bonds also depends on the purchasing method and time in consecutive years. The study analyses different investment strategies and compares their efficiency for issues maturing between 2014 and 2017.

The aim of the study is to prove that the profitability of investments in ten-year pension bonds to be redeemed between 2014 and 2017 depended on the purchasing strategy. The analysis proves that the method and time of purchasing ten-year pension bonds influenced the profitability of investments.

INTEREST RATES ON TEN-YEAR PENSION BONDS

Ten-year pension bonds are characterised by a variable interest rate and annual interest capitalisation. In the first year of interest income interest is calculated from the nominal value of bonds. In consecutive years it is calculated according to the nominal value increased by the interest accumulated at the end of the previous interest income year. The interest rate on ten-year pension bonds depends on the inflation rate and interest margin. The margin was set at a level guaranteeing that return on investments was greater than the inflation rate (Official Journal 2016, Pos. 1776). Table 1 shows the actual interest rate on ten-year pension bonds redeemed between 2014 and 2017.

In the last 4 years, or to be more precise, in the last 39 months (ten-year pension bonds have been offered since October 2004) for which complete data concerning the interest rate on the bonds were available up to the end of 2016, the average interest rate on the issues for which the inflation rate was known amounted to 5.33%. The lowest interest rate of 4.5% was noted for the April issue 2006-2016. The highest interest rate of 6.34% was noted for the November issue 2004-2014. The difference between these rates amounted to 1.84%, whereas the spread between the extreme interest rates amounted to 11.94%.

The comparison of the average interest rates in individual months of the 4 years for which calculations were completed reveals that the maximum rates were noted in October, November and

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December, i.e. 5.27%, whereas the minimum rates were noted in April, i.e. 4.91%. The difference amounted to 0.36%, whereas the spread amounted to 0.52%.

Table 1. Interest rates on ten-year pension bonds redeemed between 2014 and 2017

Month		1	2	3	4	5	6	7	8	9	10	11	12	Year
Year of interest	1										7,10%	7,10%	7,10%	2014
	2										5,10%	5,30%	5,10%	
	3										5,10%	5,10%	4,70%	
	4										5,00%	5,80%	6,50%	
	5										8,30%	8,00%	7,70%	
	6										7,20%	6,90%	6,60%	
	7										5,50%	6,00%	6,30%	
	8										7,80%	7,40%	7,80%	
	9										7,30%	7,30%	6,90%	
	10										4,60%	4,50%	4,30%	
Average	%										*6,30*	**6,34**	*6,30*	6,31
Year of interest	1	7,00%	7,00%	6,00%	6,00%	6,00%	5,50%	5,00%	4,75%	5,00%	4,50%	4,50%	5,00%	2015
	2	4,00%	3,70%	3,70%	3,70%	3,40%	3,70%	3,40%	3,30%	3,60%	3,85%	3,85%	3,45%	
	3	4,40%	4,40%	4,70%	4,90%	5,50%	5,30%	4,80%	5,10%	4,80%	3,75%	4,55%	5,25%	
	4	6,60%	7,00%	7,30%	7,20%	7,10%	7,00%	6,90%	7,10%	7,30%	7,05%	6,75%	6,45%	
	5	6,70%	6,30%	6,10%	6,30%	6,60%	7,00%	6,10%	6,00%	6,10%	5,95%	5,65%	5,35%	
	6	6,30%	6,50%	6,60%	5,90%	5,60%	5,40%	4,70%	4,80%	4,50%	4,25%	4,75%	5,05%	
	7	5,70%	6,10%	6,80%	6,60%	7,30%	7,50%	7,50%	6,70%	6,60%	6,55%	6,15%	6,55%	
	8	7,80%	7,60%	7,10%	7,30%	6,90%	7,00%	6,10%	6,80%	6,50%	6,05%	6,05%	5,65%	
	9	5,80%	5,40%	4,70%	4,30%	4,00%	3,80%	3,00%	2,70%	3,60%	3,35%	3,25%	3,05%	
	10	3,60%	3,70%	3,70%	3,70%	3,70%	3,30%	2,70%	2,80%	2,50%	2,25%	2,25%	2,25%	
Average	%	***5,79***	*5,77*	*5,67*	*5,59*	*5,61*	*5,55*	*5,02*	*5,01*	*5,05*	*4,76*	*4,78*	*4,81*	5,28
Year of interest	1	5,00%	4,75%	4,50%	4,75%	4,75%	5,25%	5,50%	5,50%	5,50%	5,50%	5,50%	5,50%	2016
	2	3,65%	3,65%	3,70%	3,90%	4,50%	4,30%	4,80%	5,10%	4,80%	4,00%	4,80%	5,50%	
	3	5,85%	6,25%	6,30%	6,20%	6,10%	6,00%	6,90%	7,10%	7,30%	7,30%	7,00%	6,70%	
	4	5,95%	5,55%	5,10%	5,30%	5,60%	6,00%	6,10%	6,00%	6,10%	6,20%	5,90%	5,60%	
	5	5,55%	5,75%	5,60%	4,90%	4,60%	4,40%	4,70%	4,80%	4,50%	4,50%	5,00%	5,30%	
	6	4,95%	5,35%	5,80%	5,60%	6,30%	6,50%	7,50%	6,70%	6,60%	6,80%	6,40%	6,80%	
	7	7,05%	6,85%	6,10%	6,30%	5,90%	6,00%	6,10%	6,80%	6,50%	6,30%	6,30%	5,90%	
	8	5,05%	4,65%	3,70%	3,30%	3,00%	2,80%	3,00%	2,70%	3,60%	3,60%	3,50%	3,30%	
	9	2,85%	2,95%	2,70%	2,70%	2,70%	2,30%	2,70%	2,80%	2,50%	2,50%	2,50%	2,50%	
	10	2,25%	2,25%	2,00%	2,00%	2,00%	2,00%	2,50%	2,50%	2,50%	2,50%	2,50%	2,50%	
Average	%	*4,82*	*4,80*	*4,55*	*4,50*	*4,55*	*4,56*	*4,98*	***5,00***	*4,99*	*4,92*	*4,94*	*4,96*	4,80
Year of interest	1	5,50%	5,75%	5,75%	5,75%	5,75%	5,75%	6,00%	6,00%	6,50%	6,50%	6,50%	6,75%	2017
	2	6,10%	6,25%	6,55%	6,45%	6,60%	6,50%	7,15%	7,35%	7,55%	7,55%	7,25%	6,95%	
	3	6,20%	5,55%	5,35%	5,55%	6,10%	6,50%	6,35%	6,25%	6,35%	6,45%	6,15%	5,85%	
	4	5,80%	5,75%	5,85%	5,15%	5,10%	4,90%	4,95%	5,05%	4,75%	4,75%	5,25%	5,55%	
	5	5,20%	5,35%	6,05%	5,85%	6,80%	7,00%	7,75%	6,95%	6,85%	7,05%	6,65%	7,05%	
	6	7,30%	6,85%	6,35%	6,55%	6,40%	6,50%	6,35%	7,05%	6,75%	6,55%	6,55%	6,15%	
	7	5,30%	4,65%	3,95%	3,55%	3,50%	3,30%	3,25%	2,95%	3,85%	3,85%	3,75%	3,55%	
	8	3,10%	2,95%	2,95%	2,95%	3,20%	2,80%	2,95%	3,05%	2,75%	2,75%	2,75%	2,75%	
	9	2,50%	2,25%	2,25%	2,25%	2,50%	2,50%	2,75%	2,75%	2,75%	2,75%	2,75%	2,75%	
	10	2,50%	2,25%	2,25%	2,25%	2,50%	2,50%	2,75%	2,75%	2,75%	2,75%	2,75%	2,75%	
Average	%	*4,95*	*4,76*	*4,73*	*4,63*	*4,85*	*4,83*	*5,03*	*5,02*	*5,09*	**5,10**	*5,04*	*5,01*	4,92
4 sets on average %	arithmetic mean	5,19	5,11	4,98	4,91	5,00	4,98	5,01	5,01	5,04	5,27	5,27	5,27	5,33
	median	4,95	4,80	4,73	4,63	4,85	4,83	5,02	5,01	5,05	5,01	4,99	4,99	5,10
	maximum	5,79	5,77	5,67	5,59	5,61	5,55	5,03	5,02	5,09	6,30	**6,34**	6,30	6,31
	minimum	4,82	4,76	4,55	***4,50***	4,55	4,56	4,98	5,00	4,99	4,76	4,78	4,81	4,80
	difference	0,98	1,01	1,12	1,10	1,07	1,00	0,04	0,02	0,10	1,55	1,57	1,50	1,52
	range	3,41	3,71	4,86	4,77	4,45	3,92	0,01	0,00	0,04	7,97	8,09	7,38	7,61

Source: own study based on: www.obligacjeskarbowe.pl

Table 1 shows the other values of detailed analysis of interest rates on ten-year pension bonds for the sets issued between 2004-2014 and 2007-2017.

THE AMOUNT OF INTEREST ON ONE TEN-YEAR PENSION BOND

Table 2 shows the amount of interest on one ten-year pension bond, which was calculated according to the interest rates provided in Table 1. The average amount of interest on one bond from the set for which calculation parameters were known up to the end of 2016 amounted to 68.16 zlotys in ten years, i.e. 6.82 zlotys per annum. Similarly to the interest rates, the lowest amount of interest was noted for the April set 2006-2016, i.e. 55.08 zlotys per bond (it was 13.08 zlotys less than the average value), whereas the highest amount of interest was noted for the November issue 2004-2014, i.e. 84.81 zlotys (it was 16.65 zlotys more than the average value). The difference between the highest and lowest value amounted to 29.73 zlotys, whereas the spread between these values amounted to 18.92%.

The comparison of the average interest per bond in individual months reveals that the maximum interest was noted in November, i.e. 67.28 zlotys, whereas the minimum interest was noted in April, i.e. 61.43 zlotys. The difference amounted to 5.85 zlotys, whereas the spread amounted to 0.83%.

Table 2 shows the other values of detailed analysis of interest on ten-year pension bonds for the issues redeemed between 2014 and 2017.

PROFIT ON TEN-YEAR PENSION BONDS PURCHASED IN 12-PIECE PACKAGES

Table 3 shows the profit gained on the securities. 13 variants were analysed: one-off purchase from January to December (12 months = 12 variants) and successive investments – a proportional number of bonds purchased each month. Table 3 shows calculations based on the interest in Table 2 for a package of 12 bonds and for 2 (24 bonds) and 3 packages (36 bonds) with 12 bonds per package. The number of bonds in a package corresponds to the number of months in a year. This enables easy presentation of variant 13, i.e. purchasing one ten-year pension bond every month.

As results from Table 3, the prices of ten-year pension bonds redeemed in 2014 were characterised by the greatest stability. Only three sets were issued: October – December. The spread between the prices was 0.01%. The greatest diversification in prices was noted in 2015. The differences amounted to 187.52 zlotys per 12 bonds. The spread between the interest paid was 6.09%.

Three variants of interest in individual months were analysed: 1) October – December – 4 sets were issued; 2) January – September - 3 sets were issued; 3) successive monthly purchase of 12-bond packages – 4 sets were analysed.

In the first group the purchase made in November was the most profitable. The interest on 4 sets of packages of 12 bonds amounted to 3,229.32 zlotys, i.e. 807.33 zlotys per set. In the second group the purchase made in January was the most profitable. The interest on 3 sets amounted to 2,367.12 zlotys, i.e. 789.04 zlotys per set. The third variant – successive purchase: in 2014 – 4 bonds purchased every month, between 2015 and 2017 – 1 bond purchased every month. The interest on 4 sets amounted to 3,271.45 zlotys, i.e. 817.86 zlotys per set. However, the comparison of the first and second variant is burdened with error due to the difference of one set issued. The missing set gained relatively high interest in the first year.

The average difference between the successive purchase and November purchase amounted to 10.53 zlotys per set. The average difference between the successive purchase and January purchase amounted to 28.82 zlotys per set. The average difference between the October purchase and January purchase amounted to 18.29 zlotys per set.

As results from Table 3, when bonds were purchased in packages of 12 items or when multiples of these packages were bought (2 and 3 packages were analysed), successive purchase was the most profitable.

Table 3 shows additional variants: the best variant – every year bonds were purchased in the most profitable month (2004 - in November, 2005 – in January, 2006 – in August, 2007 - in

October) and the worst variant – every year bonds were purchased in the least profitable month (2004 and 2005 - in October, 2006 and 2007 - in April). The difference between these variants was 382.32 zlotys for the package of 12 bonds and 1,146.96 zlotys for the package of 36 securities; the spread between the best and worst variant was 1.39%.

Table 2. The amount of interest and profit on one ten-year pension bond redeemed between 2014 and 2017

Set	Year	Month	1	2	3	4	5	6	7	8	9	10	11	12	Average year		Diffe-rence	Range
1	2014	interest										***6,30***	**6,34**	6,30	6,31	%	0,04	0,00
		profit										***84,08***	**84,81**	84,11	84,33	zł	0,73	0,01
2	2015	interest	**5,79**	5,77	5,67	5,59	5,61	5,55	5,02	5,01	5,05	***4,76***	4,78	4,81	5,28	%	1,04	3,89
		profit	**75,43**	75,1	73,46	72,15	72,46	71,46	63,02	62,78	63,51	***58,97***	59,30	59,75	67,28	zł	16,46	6,09
3	2016	interest	4,82	4,80	4,55	***4,50***	4,55	4,56	4,98	**5,00**	4,99	4,92	4,94	4,96	4,80	%	0,51	1,13
		profit	59,9	59,67	55,90	***55,08***	55,82	55,93	62,37	**62,68**	62,54	61,45	61,79	62,1	59,60	zł	7,60	1,67
4	2017	interest	4,95	4,76	4,73	***4,63***	4,85	4,83	5,03	5,02	5,09	**5,10**	5,04	5,01	4,92	%	0,47	0,92
		profit	61,93	59,02	58,56	***57,05***	60,3	59,97	63,02	62,87	63,96	**64,12**	63,21	62,82	61,40	zł	7,07	1,37
4 sets on average		interest	5,19	5,11	4,98	***4,91***	5,00	4,98	5,01	5,01	5,04	5,27	**5,27**	5,27	5,33	%	0,37	0,52
		profit	65,75	64,60	62,64	***61,43***	62,86	62,45	62,80	62,78	63,34	67,16	**67,28**	67,20	68,16	zł	5,85	0,83
Median		interest	4,95	4,80	4,73	***4,63***	4,85	4,83	5,02	5,01	**5,05**	5,01	4,99	4,99	5,10	%	0,42	0,75
		profit	61,93	59,67	58,56	***57,05***	60,30	59,97	63,02	62,78	**63,51**	62,79	62,50	62,46	64,34	zł	6,46	1,15
Maximum		interest	5,79	5,77	5,67	5,59	5,61	5,55	5,03	5,02	5,09	6,30	**6,34**	6,30	6,31	%	1,33	5,52
		profit	75,43	75,10	73,46	72,15	72,46	71,46	63,02	62,87	63,96	84,08	**84,81**	84,11	84,33	zł	21,94	9,03
Minimum		interest	4,82	4,76	4,55	***4,50***	4,55	4,56	4,98	5,00	4,99	4,76	4,78	4,81	4,80	%	0,51	1,13
		profit	59,90	59,02	55,90	***55,08***	55,82	55,93	62,37	62,68	62,54	58,97	59,30	59,75	59,60	zł	7,60	1,67
Difference		interest	0,98	1,01	1,12	1,10	1,07	1,00	0,04	***0,02***	0,10	1,55	**1,57**	1,50	1,52	%	1,85	4 sets total
		profit	15,53	16,08	17,56	17,07	16,64	15,53	0,65	***0,19***	1,42	25,11	**25,51**	24,36	24,73	zł	29,73	
Range		interest	3,41	3,71	4,86	4,77	4,45	3,92	0,01	***0***	0,04	7,97	**8,09**	7,38	7,61	%	11,84	
		profit	5,34	5,83	7,51	7,33	6,85	6,03	0,01	***0***	0,05	12,72	**12,94**	11,81	12,17	zł	18,92	

Source: own study based on: www.obligacjeskarbowe.pl

ASSESSMENT OF THE PURCHASING STRATEGY OF TEN-YEAR PENSION BONDS TO BE DEPOSITED IN AN INDIVIDUAL RETIREMENT ACCOUNT (IRA) – BONDS

Table 4 compares 13 purchasing strategies based on the variants presented in Table 3. These strategies are important when bonds purchased are to be deposited in an individual retirement account (IRA) – Bonds. The number of bonds that can be purchased and deposited in a retirement account is strictly specified in Article 13 Paragraph 4 of the law on individual retirement accounts and individual pension security accounts. It remains the responsibility of the minister in charge of social security (Official Journal 2016, Pos. 1776). The minister's decision about the number of bonds that can be purchased and deposited in a retirement account was announced in December of the previous year, except the first decision, which was announced in June 2004.

Apart from the interest calculated for 1 and 12 bonds shown in Table 3, Table 4 includes the interest calculated for the number of bonds resulting from the decision of the Minister of Labour and Social Policy between 2004 and 2007. In 2004 (MP 2004 27/466) the regulation allowed purchasing 34 bonds to be deposited in an IRA, in 2005 (MP 2004 56/957) and 2007 (MP 2006 90/952) - 36 bonds, in 2006 (MP 2005 84/1220) - 35 bonds.

According to the strategies assumed for January – October in the first year (2004) all bonds were purchased in October. There was minimal difference – as results from the analysis of Table 1, the difference between extreme values of interest rates amounted to 0.37%, whereas the spread of interest rates amounted to 0.52%.

Table 3. Profit on ten-year pension bonds purchased in 12-piece packages redeemed between 2014 and 2017

Set	Year	Months	Month												Purchase			Assessment	
			1	2	3	4	5	6	7	8	9	10	11	12	succe-ssive	best	worst	difference	range
1	2014	1										***84,08***	**84,81**	84,11		84,81	84,08	0,73	0,01
		12										1008,96	1017,72	1009,32	1012,00	1017,72	1008,96	8,76	
	*12	2										2017,92	2035,44	2018,64	2024,00	2035,44	2017,92	17,52	
		3										3026,88	3053,16	3027,96	3036,00	3053,16	3026,88	26,28	
2	2015	1	**75,43**	75,10	73,46	72,15	72,46	71,46	63,02	62,78	63,51	***58,97***	59,30	59,75		75,43	58,97	16,46	6,09
		12	905,16	901,20	881,52	865,80	869,52	857,52	756,24	753,36	762,12	707,64	711,60	717,00	807,39	905,16	707,64	197,52	
	*12	2	1810,32	1802,40	1763,04	1731,60	1739,04	1715,04	1512,48	1506,72	1524,24	1415,28	1423,20	1434,00	1614,78	1810,32	1415,28	395,04	
		3	2715,48	2703,60	2644,56	2597,40	2608,56	2572,56	2268,72	2260,08	2286,36	2122,92	2134,80	2151,00	2422,17	2715,48	2122,92	592,56	
3	2016	1	59,9	59,67	55,90	***55,08***	55,82	55,93	62,37	**62,68**	62,54	61,45	61,79	62,1		62,68	55,08	7,60	1,67
		12	718,80	716,04	670,80	660,96	669,84	671,16	748,44	752,16	750,48	737,40	741,48	745,20	715,23	752,16	660,96	91,20	
	*12	2	1437,60	1432,08	1341,60	1321,92	1339,68	1342,32	1496,88	1504,32	1500,96	1474,80	1482,96	1490,40	1430,46	1504,32	1321,92	182,40	
		3	2156,40	2148,12	2012,40	1982,88	2009,52	2013,48	2245,32	2256,48	2251,44	2212,20	2224,44	2235,60	2145,69	2256,48	1982,88	273,60	
4	2017	1	61,93	59,02	58,56	***57,05***	60,3	59,97	63,02	62,87	63,96	**64,12**	63,21	62,82		64,12	57,05	7,07	1,37
		12	743,16	708,24	702,72	684,60	723,60	719,64	756,24	754,44	767,52	769,44	758,52	753,84	736,83	769,44	684,60	84,84	
	*12	2	1486,32	1416,48	1405,44	1369,20	1447,20	1439,28	1512,48	1508,88	1535,04	1538,88	1517,04	1507,68	1473,66	1538,88	1369,20	169,68	
		3	2229,48	2124,72	2108,16	2053,80	2170,80	2158,92	2268,72	2263,32	2302,56	2308,32	2275,56	2261,52	2210,49	2308,32	2053,80	254,52	
4 sets together		1	197,26	193,79	187,92	184,28	188,58	187,36	188,41	188,33	190,01	268,62	269,11	268,78		287,04	255,18	31,86	1,39
		12	2367,12	2325,48	2255,04	2211,36	2262,96	2248,32	2260,92	2259,96	2280,12	3223,44	3229,32	3225,36	3271,45	3444,48	3062,16	382,32	
		24	4734,24	4650,96	4510,08	4422,72	4525,92	4496,64	4521,84	4519,92	4560,24	6446,88	6458,64	6450,72	6542,90	6888,96	6124,32	764,64	
		36	7101,36	6976,44	6765,12	6634,08	6788,88	6744,96	6782,76	6779,88	6840,36	9670,32	9687,96	9676,08	9814,35	10333,44	9186,48	1146,96	
Average 1 set - 12 pieces			789,04	775,16	751,68	737,12	754,32	749,44	753,64	753,32	760,04	805,86	807,33	806,34	817,86	861,12	765,54	95,58	

Source: own study based on: www.obligacjeskarbowe.pl

Table 4. Assessment of the purchasing strategy of ten-year pension bonds to be deposited in an individual retirement account (IRA) – Bonds redeemed between 2014 and 2017

Set	Year	Number of bonds	Month												Purchase			Assessment	
			1	2	3	4	5	6	7	8	9	10	11	12	succe-ssive	best	worst	difference	range
1	2014	1				***84,08***							**84,81**	84,11		84,81	84,08	0,73	0,01
		12				1008,96							1017,72	1009,32	1012,00	1017,72	1008,96	8,76	
		34				2858,72							2883,54	2859,74	2867,08	2883,54	2858,72	24,82	
2	2015	1	**75,43**	75,10	73,46	72,15	72,46	71,46	63,02	62,78	63,51	***58,97***	59,30	59,75		75,43	58,97	16,46	6,09
		12	905,16	901,20	881,52	865,80	869,52	857,52	756,24	753,36	762,12	707,64	711,60	717,00	807,39	905,16	707,64	197,52	
		36	2715,48	2703,60	2644,56	2597,40	2608,56	2572,56	2268,72	2260,08	2286,36	2122,92	2134,80	2151,00	2422,17	2715,48	2122,92	592,56	
3	2016	1	59,9	59,67	55,90	***55,08***	55,82	55,93	62,37	**62,68**	62,54	61,45	61,79	62,1		62,68	55,08	7,60	1,67
		12	718,80	716,04	670,80	660,96	669,84	671,16	748,44	752,16	750,48	737,40	741,48	745,20	715,23	752,16	660,96	91,20	
		35	2096,50	2088,45	1956,50	1927,80	1953,70	1957,55	2182,95	2193,80	2188,90	2150,75	2162,65	2173,50	2083,59	2193,80	1927,80	266,00	
4	2017	1	61,93	59,02	58,56	***57,05***	60,3	59,97	63,02	62,87	63,96	**64,12**	63,21	62,82		64,12	57,05	7,07	1,37
		12	743,16	708,24	702,72	684,60	723,60	719,64	756,24	754,44	767,52	769,44	758,52	753,84	736,83	769,44	684,6	84,84	
		36	2229,48	2124,72	2108,16	2053,80	2170,80	2158,92	2268,72	2263,32	2302,56	2308,32	2275,56	2261,52	2210,49	2308,32	2053,8	254,52	
Together 4 sets		1	**281,34**	277,87	272,00	***268,36***	272,66	271,44	272,49	272,41	274,09	268,62	269,11	268,78		287,04	255,18	31,86	1,39
		12	3376,08	3334,44	3264,00	3220,32	3271,92	3257,28	3269,88	3268,92	3289,08	3223,44	3229,32	3225,36	3271,45	3444,48	3062,16	382,32	
		141	9900,18	9775,49	9567,94	9437,72	9591,78	9547,75	9579,11	9575,92	9636,54	9440,71	9456,55	9445,76	9583,33	10101,14	8963,24	1137,90	1,43
Viability of purchase			**1**	2	8	***13***	4	9	6	7	3	12	10	11	5				
Difference between purchase	best		-200,96	-325,65	-533,20	-663,42	-509,36	-553,39	-522,03	-525,22	-464,60	-660,43	-644,59	-655,38	-517,81	0,00	-1137,90		
	worst		936,94	812,25	604,70	474,48	628,54	584,51	615,87	612,68	673,30	477,47	493,31	482,52	620,09	1137,90	0,00		
	successive		316,85	192,16	-15,39	-145,61	8,45	-35,58	-4,22	-7,41	53,21	-142,62	-126,78	-137,57	0,00	517,81	-620,09		
	January		**0,00**	**-124,69**	**-332,24**	**-462,46**	**-308,40**	**-352,43**	**-321,07**	**-324,26**	**-263,64**	**-459,47**	**-443,63**	**-454,42**	**-316,85**	**200,96**	**-936,94**		
	April		462,46	337,77	130,22	0,00	154,06	110,03	141,39	138,20	198,82	2,99	18,83	8,04	145,61	663,42	-474,48		

Source: own study based on: www.obligacjeskarbowe.pl

Table 3 shows the other values of detailed analysis of profit gained on ten-year pension bonds purchased in packages of 12 items.

As far as the variant of successive purchasing of ten-year pension bonds is concerned, it was assumed that in the last months of 2004, i.e. in November and December there was 1 bond less purchased than in October. For 2006 it was assumed that in December there was 1 bond less purchased than in the first eleven months of the year. As a result of these simplifications, in Table 4 it was possible to make an effective comparison of the 13 aforementioned variants of strategies of purchasing ten-year pension bonds.

As results from the analysis of Table 4, bonds purchased in January were the most profitable, whereas the securities purchased in April were the least profitable to. The difference in profits for 4 sets of ten-year pension bonds amounted to 462.46 zlotys. The successive purchase variant took the fifth place, after bonds purchased in January, February, May and September. It was 316.85 zlotys less profitable than the January variant and 145.61 zlotys more profitable than the April variant. The spread between the January and April purchase variant amounted to 0.23%.

Like in Table 3, additional comparative variants were added: the best variant – every year the bonds were purchased in the most profitable month, and the worst variant – every year the bonds were purchased in the least profitable month. The difference between extreme investments in ten-year pension bonds amounted to 1,137.90 zlotys, whereas the spread amounted to 1.43%.

Table 4 shows the other values of detailed analysis of the purchasing strategy of ten-year pension bonds to be deposited in an individual retirement account – Bonds.

CONCLUSIONS

The analysis of 39 sets of ten-year pension bonds for which profitability parameters were known up to the end of 2016 showed that the time when the securities were purchased affected the profitability of the entire investment in ten-year pension bonds deposited in an individual retirement account – Bonds. Between 2005 and 2007 ten-year pension bonds purchased in January were the most profitable, whereas the bonds purchased in April were the least profitable. This situation was mostly caused by the year 2005, when inflation was decreasing rapidly and the interest rates on the securities under study became considerably reduced.

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TEN-YEAR TREASURY BONDS – FINANCING THE BUDGET DEFICIT AND PENSION SYSTEM

Abstract. The abandonment of the second pillar of the Polish pension system, i.e. open pension funds, which will be effective as of 2018, will strengthen the significance of the third pillar, which has been optional so far. Ten-year treasury pension bonds are an important element of the third pillar. They are one of the ways in which it is possible to have a share in individual retirement accounts. The article analyses the significance of ten-year pension bonds for state budget financing and their role in the Polish pension system.

Key words: treasury bonds, budget deficit, pension system

INTRODUCTION

Citizens' old-age and disability pension security is one of the most important determinants of the condition of public finance. Expenditures on pensions are the most important element of public sector expenditures in Poland. Due to the unfavourable demographic tendencies which have been observed for several decades they are a considerable direct burden to the national economy and an indirect burden to citizens because of taxes and fees paid to the budget. The financing of retirement and disability pensions in Poland amounts to more than 30% of an average citizen's funds: in 2013 – 31.10%, in 2014 – 30.44%, in 2015 – 30.61%. This largest item on the list of expenditures is about three times greater than the amount spent on education (more than 11% of a citizen's funds on state expenditures) and health care (nearly 11%). It is about ten times greater than the amount spent on science and higher education (less than 3.5%) (Balcerowicz 2014, 2015, 2016; Komunikat 2016).

The aim of the study is to prove the significance of ten-year pension bonds for budget deficit financing and their role in the Polish pension system.

BUDGET DEFICIT AND PUBLIC DEBT FINANCING

We can observe a budget deficit when budget expenditures are greater than budget income. In Poland this situation has been continuing for several decades. We can talk about public debt when consecutive budget deficits are accumulated. It is total debt resulting from budget deficits from consecutive years, debts of local governments and extra-budgetary funds, including the Social Insurance Fund, from which pensions are financed. At the beginning of January 2017 the public debt in Poland exceeded the amount of a trillion zlotys (1 000 000 000 000), i.e. 26,338 zlotys per capita (Balcerowicz 2017).

In 1997 the Stability and Growth Pact was agreed on at the EU summit in Amsterdam. The member-states which signed the Pact committed themselves to:

- maintaining the maximum budget deficit at 3% of the GDP,
- maintaining the ratio between the public debt and the GDP at the maximum value of 60%.

The member-states agreed on the rules of the Exchange Rate Mechanism II, which is important when candidates are admitted to the European Monetary System - Economic and Monetary Union (EMU).

At the end of 2016 the deficit of the public finance sector became reduced to about 2% of the GDP. It was caused by the good financial result of local governments. According to the data of the

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Ministry of Finance, at the end of November 2016 the budget surplus of local governments exceeded 19 billion zlotys (Sąsiada 2017).

The public debt should not exceed 60% of the GDP. In 2016 the value of this ratio amounted to 53.8% in Poland. By comparison, in Germany the debt amounted to more than 70%, in the United Kingdom – nearly 90%, in the euro zone - more than 90%, in the United States - more than 100%, in Italy - more than 130%, in Japan - almost 230% (Słomski 2017). According to the Ministry of Finance, at the end of 2017 the ratio between the public debt and the GDP should amount to more than 51%.

As long as the 60% limit is not exceeded, there is relative equilibrium in public finance. As the debt increases, so do its service costs. It particularly applies to the value of interest paid to investors on the maturity of securities issued by the state. Indebted countries simultaneously pay some of their liabilities, finance current expenditures and do not want to raise taxes excessively. When the debt is too high and it is impossible to repay it in sufficient amounts, the payment of liabilities becomes suspended. The state announces a debt moratorium. Apart from the moratorium, other troublesome operations related with the debt include repudiation, i.e. complete cessation of repayment, and debt conversion – the amount of the debt and the repayment deadline are negotiated with creditors (Sowell 2016).

Apart from the debt that is publically announced by the Ministry of Finance, there is also hidden debt, i.e. liabilities of the state concerning future payments. For example, it includes. the value of future pensions. As results from the investigations made by the Civil Development Fund, the hidden debt is more than three times greater than the officially announced public debt. Thus, the total debt of Poland is greater than 4 trillion zlotys, i.e. more than 200% of the GDP (Balcerowicz 2016).

Among the investors that gave a loan to the state there are mostly households, commercial banks, Polish and foreign investment funds. The state treasury usually incurs debt by issuing securities, which are redeemed after a fixed time. The amount of money paid back to investors is increased by the interest rate.

In Poland ten-year pension bonds are an important form of long-term securities, mostly addressed to households.

FINANCING THE PENSION SYSTEM

For several decades there has been an unfavourable demographic situation in Poland and it has a growing tendency. There is a growing number of retired people in relation to economically active people. This relation is defined as old-age dependency ratio (DR). Analyses show that a person who will retire between 2040 and 2050 will receive a pension amounting to about a third of their last salary. Therefore, it is necessary to make voluntary savings for retirement. At present ten-year pension bonds are an element financing the third, optional pillar of the pension system through individual retirement accounts (IRA). Ten-year pension bonds are a safe financial instrument issued and guaranteed by the state treasury.

It is important for future pensioners that IRAs are exempt from the capital gains tax. The IRA Act (Official Journal 2016, Pos. 1776) specifies the amount of annual IRA deposits that are exempt from the capital gains tax. According to Article 13.1 of the Act, IRA deposits made in a calendar year must not exceed the triple amount of an average monthly salary that is predicted in the national economy in a given year. This amount is specified in the budget act or interim budget act or in budget bills if relevant laws have not been enacted. If the amount defined according to the rule given above is smaller than the amount announced in the previous calendar year, the amount of IRA deposits announced in the previous calendar year is applicable. The rule of the triple amount of an average monthly salary that is predicted in the national economy in a given year has been applicable since 2009. Between 2004 and 2008 the permissible amount of an IRA deposit was smaller by half.

Limits of IRA deposits are defined by the minister in charge of social security (Official Journal 2016, Pos. 1776).

At the beginning of 2018 the second pillar of the pension system, i.e. open pension funds, will be replaced by investment funds. A quarter of the amount deposited in open pension funds will be transferred to the Demographic Reserve Fund, which will support the first pillar. The remainder will be managed by investment funds as private deposits, being an important part of the third pillar. It is assumed that all assets of the current open pension funds which are not shares of the companies listed at the Warsaw stock exchange will be transferred to the state system, i.e. the first pillar.

SUMMARY AND CONCLUSIONS

Ten-year pension bonds play an important role in the Polish public finance system. They are a source of finance for the state budget and an important element financing the pension system. Pensioners-to-be deposit their funds, which will be used to finance part of their future pensions.

As of 2018 the third pillar and ten-year pension bonds will be even more important as a source of deposits for pensions and simultaneously, as a source of budget deficit financing.

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LABOUR MARKET SECURITY AND FLEXIBILITY MODEL AND ITS POTENTIAL IMPLEMENTATION IN POLAND

Abstract: The article describes the main assumptions and constituents of the Danish model of flexicurity. In particular, it provides a description of basic labour flexibility features and their typology, and addresses the problem of security from both, employer's and employee's perspective. The article emphasises the complexity of socioeconomic conditions that need to be fulfilled so that the labour market can enjoy both flexibility and security. Attention is also paid to uneven risk distribution regarding the practical implementation of the model. Determinant factors of the flexicurity model for Polish labour market have been indicated. The article is based on secondary research and statistical analysis of Eurostat data.

Key words: Security, flexibility, labour market, flexicurity model

INTRODUCTION

Rapid technological progress and globalisation influence the dynamics of adjustment processes on the labour market. In order to improve their competitive ability, companies tend to prefer qualified workforce willing to excel their skills in response to the changing market. In other words, they opt for labourers who can adapt to the labour market. This can lead to a division of the labour market into two groups of workers, those whose employment is stable and those whose it is not. Therefore, labour market flexibility is generally perceived as harmful to employees' security and the two variables remain in mutual interaction, resulting either in improved security or in greater flexibility. Considering them as complimentary processes can, thus, prove to be very difficult in practice. The two participants of the labour market, i.e. employers and employees, have different expectations from work. Employers expect flexibility while employees typically opt for work security. The Danish model of flexicurity attempts to reconcile these two somewhat contradictory aspects of the labour market. It consists on the assumption that the relationship between flexibility and security on the labour market is that of complementation rather than substitution. Successful application of the model, which has already resulted in low unemployment level in Denmark (since 2008), has encouraged researchers and international institutions to adopt a standpoint regarding the possibilities of its further adaptations, particularly in other EU countries. The flexicurity model constitutes an attempt to find the equilibrium between labour market flexibility and social security of employees and the unemployed. Its main objective is to ensure employment security at every stage of professional life considering the growing insecurity of the labour market. Labour market volatility is primarily caused by the demand on labour, which, in turn, results in the need of increased adaptive flexibility on the part of the labour force and new, or, at least, modified, management tools. The Danish model therefore constitutes a response to the challenges of the contemporary labour market, yet its adaptation to other European countries may be problematic. Hence, although the model can be successfully applied in Denmark, only a limited selection of its elements can be adopted in other European economies.

THE NATURE AND MAIN ASSUMPTIONS OF THE FLEXICURITY MODEL

The flexicurity model was created in Denmark in the 1990s, where, according to general assessment, compromising between market flexibility and social security contributed to the

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achievement of EU-lowest unemployment rate. The state continued until the financial crisis in 2008, after which the unemployment rate increased to a higher level. Between 2009 and 2014 the average unemployment rate amounted to 7.03% (table 1).

Table 1.Unemployment rate in EU countries 2004-2014

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Austria	5.6	5.3	4.9	4.1	5.3	4.8	4.6	4.9	5.4	5.6
Belgium	8.5	8.3	7.5	7.0	7.9	8.3	7.2	7.6	8.4	8.5
Bulgaria	10.1	9.0	6.9	5.6	6.8	10.3	11.3	12.3	13.0	11.4
Croatia	13.0	11.6	9.9	8.6	9.2	11.7	13.7	16.0	17.3	17.3
Cyprus	5.3	4.6	3.9	3.7	5.4	6.3	7.9	11.9	15.9	16.1
Czech Republic	7.9	7.1	5.3	4.4	6.7	7.3	6.7	7.0	7.0	6.1
Denmark	4.8	3.9	3.8	3.4	6.0	7.5	7.6	7.5	7.0	6.6
Estonia	8.0	5.9	4.6	5.5	13.5	16.7	12.3	10.0	8.6	7.4
Finland	8.4	7.7	6.9	6.4	8.2	8.4	7.8	7.7	8.2	8.7
France	8.9	8.8	8.0	7.4	9.1	9.3	9.2	9.8	10.3	10.3
Germany	11.2	10.1	8.5	7.4	7.6	7.0	5.8	5.4	5.2	5.0
Greece	10.0	9.0	8.4	7.8	9.6	12.7	17.9	24.5	27.5	26.5
Great Britain	4.8	5.4	5.3	5.6	7.6	7.8	8.1	7.9	7.6	6.1
Holland	5.9	5.0	4.2	3.7	4.4	5.0	5.0	5.8	7.3	7.4
Hungary	7.2	7.5	7.4	7.8	10.0	11.2	11.0	11.0	10.2	7.7
Ireland	4.4	4.5	4.7	6.4	12.0	13.9	14.7	14.7	13.1	11.3
Italy	7.7	6.8	6.1	6.7	7.7	8.4	8.4	10.7	12.1	12.7
Latvia	10.0	7.0	6.1	7.7	17.5	19.5	16.2	15.0	11.9	10.8
Lithuania	8.3	5.8	4.3	5.8	13.8	17.8	15.4	13.4	11.8	10.7
Luxembourg	4.6	4.6	4.2	4.9	5.1	4.6	4.8	5.1	5.9	6.0
Malta	6.9	6.8	6.5	6.0	6.9	6.9	6.4	6.3	6.4	5.9
Poland	17.9	13.9	9.6	7.1	8.1	9.7	9.7	10.1	10.3	9.0
Portugal	8.8	8.9	9.1	8.8	10.7	12.0	12.9	15.8	16.4	14.1
Romania	7.1	7.2	6.4	5.6	6.5	7.0	7.2	6.8	7.1	6.8
Slovakia	16.4	13.5	11.2	9.6	12.1	14.5	13.7	14.0	14.2	13.2
Slovenia	6.5	6.0	4.9	4.4	5.9	7.3	8.2	8.9	10.1	9.7
Spain	9.2	8.5	8.2	11.3	17.9	19.9	21.4	24.8	26.1	24.5
Sweden	7.7	7.1	6.1	6.2	8.3	8.6	7.8	8.0	8.0	7.9
EU (28)	9.0	8.2	7.2	7.0	9.0	9.6	9.7	10.5	10.9	10.2

Source: Authors' own work based on Eurostat data.

The term "flexicurity" derives from two English words, i.e. *flexibility* and *security*. The implementation of the idea is expected to improve people's prospects of quick employment at all stages of professional life, given the conditions of dynamically changing economy and progressing globalisation. Meeting the demands of global competition makes employers react promptly to buyers' dynamically changing expectations. It can lead to making some employees redundant as well as increase demand for employees equipped with skills required for more technologically advanced production processes. The model assumes that job seekers respond to changeable labour

market flexibly and acquire new skills through various forms of training. This involves a flexible attitude towards the possessed skills and a high level of readiness to improve them if they cannot meet potential employers' expectations.

The Danish flexicurity model is based on three pillars:

1. Flexible employment regulations, which results in high numerical flexibility,
2. Extensive social security system,
3. Active market policy consisting in applying common stimulating and educational activities aimed to motivate the unemployed to seek employment.

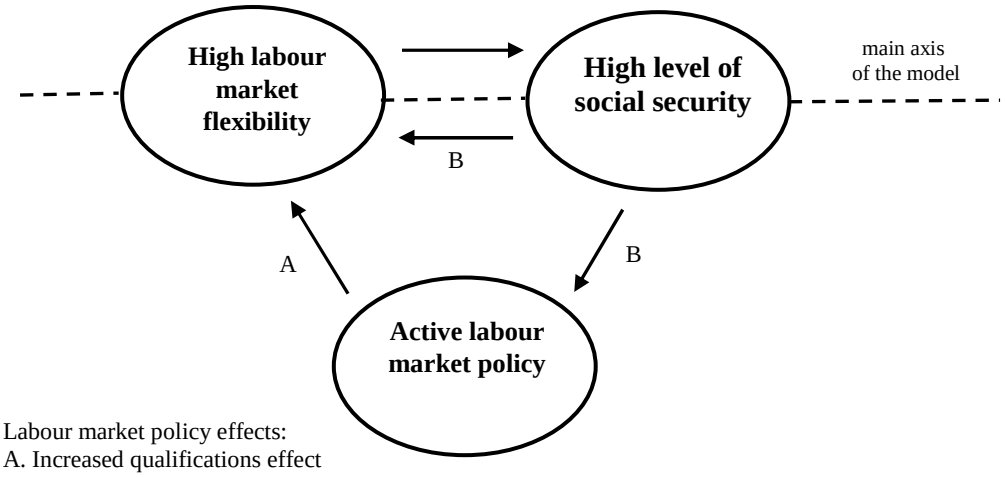

Figure 1. The Danish "golden triangle"

Source: Gmurczyk J. (2012), Flexicurity w Danii i Polsce wnioski i rekomendacje, Analiza 2012/3, Instytut Obywatelski.

The pillars of the model are known as the so-called golden triangle. According to Lang [2015, pp.2-3],

"the two arrows connecting the labour market and the social system reflect the fact that approx. 25% of all employees face the problem of unemployment every year, but most of them find another job very quickly. The other arrows show that people who do not find new employment quickly are involved in active labour market programmes".

The main flexibility features in this model on the part of the employee consist in smooth changes in their professional life, starting with graduation, and involving changing jobs, as well as the relative easiness of finding employment after a period of long-term unemployment. The model emphasises the following types of flexibility:

- external numerical flexibility consisting in the easiness of recruiting employees and making them redundant, untypical employment contracts, very low level of labour market regulation,
- internal flexibility, involving working time flexibility (working part-time, flexitime, shifts) and functional flexibility (job rotation, extending the scope of duties, multi-jobbing, flexible workflow),

- remuneration flexibility, involving the dependency on efficiency and outcomes, consisting in adjusting the level of remuneration to labour market processes and the economic situation of the company.

According to the Danish model, work flexibility involves the application of legal regulations which make it possible to sign employment contracts relatively quickly and easily. On the part of the employer, it mainly involves creating better conditions of human resources management, which can be resolved by applying flexible forms of employment. Consequently, the labour market is characterised by increased volatility, which is reflected by, e.g. staff fluctuation, amounting to 30% annually in Denmark, and the fluctuation of posts, amounting to 12%.

An important part of the model is played by social partners represented by trade unions and employers' organisations. Since the role of the state as the labour market regulator is minimal, the implementation of the model is possible given the high rate of trade union membership. Was it not the case, employees' situation on the labour market would be at stake due to market flexibility. At the same time, security can be approached from three perspectives:

- workplace security (protection from redundancies resulting from adjusting qualifications to labour market expectations),
- employment security (ability to find employment),
- income security (guarantee of income after job loss)

Another element of the "golden triangle" is a generous social system, which ensures employees' security through a system of private unemployment insurance funds subsidised by the state. The unemployed receive a benefit of up to 90% of their previous monthly pay, but not exceeding 400 euros. The level of the benefits depends on the family situation and the level of remuneration in the past employment period.

The final element of the Danish model is active labour market policy. The share of relevant expenses in GDP is very high, which make Denmark outperform other EU economies in this respect. Expenses on active policy include, first of all, benefits and employment support. The share of these expenses on labour market policy is considerable. Between 2005 and 2013 it amounted to between 30.2% and 44.6% (table 2).

Table 2. Public expenses on labour market policy as a percentage of Danish GDP (%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Labour market services	4.2	4.9	5.4	9.7	9.7	13.0	12.5	12.1	11.9
Trainings	13.4	13.4	12.6	9.6	9.3	11.4	10.6	9.8	9.8
Employment suport	6.4	6.1	4.6	5.3	5.8	8.7	11.4	11.4	11.8
Enhanced employment, rehabilitation	13.6	17.8	20.9	25.2	21.3	18.1	18.4	17.6	17.1
Direct job creation	0.002	0.002							
Support for start-ups	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Benefits	44.6	40.3	36.8	30.2	40.2	38.7	38.1	41.2	42.0
Earlier retirement	17.8	17.6	19.6	20.0	13.8	10.1	9.0	7.9	7.4
Total expenses	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Authors' own work based on Eurostat data.

As can be seen, companies are the main beneficiary of labour market flexibility. They recruit highly qualified workforce, which increases their security through an improvement in their competitiveness. As regards the potential benefits on the part of employees, their distribution is not unequivocal. Beneficiaries are limited to those who adjust their qualifications, which results in increased security in job search. However, some labourers may react inappropriately to labour market processes after their job stability is threatened. It is confirmed by the level of unemployment rate after 2008, i.e. after crisis, when some employees were not able to adapt to the new labour market conditions, which consequently kept the unemployment rate at a relatively high level. Also, Danish labour market security is at risk more than elsewhere due to a relatively low popularity of fixed term employment and, at the same time, a relatively high proportion of part-time employment comparing to other EU countries. Between 2005 and 2014, the average proportion of employees on fixed-term contracts amounted to 8.8% in Denmark, whereas it amounted to 14.0% on average in the EU, and as regards the average proportion of part-time employment, it is equal to 24.1% in Denmark, but only 18.3% in the EU (table 3).

Table 3. Share of fixed-term employment and part-time employment in the EU, Denmark and Poland between 2005 and 2014

Year	Fixed-term employment			Part-time employment		
	EU (28)	Poland	Denmark	EU (28)	Poland	Denmark
2005	14.0	25.6	9.8	17.2	9.8	21.5
2006	14.5	27.3	8.9	17.5	8.9	23.0
2007	14.6	28.2	9.0	17.5	8.5	23.0
2008	14.1	26.9	8.5	17.5	7.7	23.8
2009	13.6	26.4	8.7	18.0	7.7	25.2
2010	13.9	27.2	8.5	18.5	7.7	25.6
2011	14.0	26.8	8.9	18.8	7.3	25.1
2012	13.7	26.8	8.6	19.2	7.2	24.8
2013	13.7	26.8	8.8	19.6	7.1	24.7
2014	14.0	28.3	8.6	19.6	7.1	24.6

Source: Authors' own work based on Eurostat data.

Since the Danish labour market is heavily oriented towards increasing productive employment, it faces the risk of marginalising and even excluding some groups of workforce. Those groups at risk include elderly workers, as well as young employees and women, since, for objective reasons, they demonstrate a lower ability to adapt to the changeable labour market. Therefore, the practical application of the model requires specific legal solutions regarding the creation and protection of workplaces of the groups at risk [Rymsza 2005, p.32].

POSSIBILITIES OF IMPLEMENTING THE FLEXIXURITY MODEL ON THE POLISH LABOUR MARKET

On 27 June 2007 the European Commission issued a communication including recommendations for common flexicurity rules in EU countries. It pointed to the need to define appropriate strategies of modernising domestic labour markets. The document emphasises that defining and implementing the flexicurity policy should include the four components listed below:

1. Flexible and predictible conditions of employment (from both employee's and employers' perspective, concerning both permanently employed and fixed-term employees) resulting from employment law, collective bargaining, and workflow.
2. Complex strategies of lifelong learning, ensuring constant adaptation of employees to labour market demands, particularly concerning employees facing unemployment.
3. Efficient active labour market policy, supporting dynamic change handling, resulting in shortening unemployment periods and facilitating changing jobs.
4. Modern social security systems ensuring appropriate income support promoting employment and facilitating mobility on the labour market [Commision of the European Communities 2007, p. 6].

The EU Commission communication also points to the necessity of social debate in EU countries in order to produce some common rules of creating and implementing the *flexicurity* strategy. Various bodies, including assemblies of scientists, have entered the social debate over the possibility of implementing some elements of the flexicurity model in Poland. Papers dedicated to this topic typically point to the barriers of implementing the solution. The conviction of lack of possibilities of implementing the solution on the Polish labour market or its numerous limitations [Gmurczyk 2012, p.12-21]. It results from Poland's different developmental determinants, administrative barriers of starting a company, and institutional, legal and cultural barriers of the labour market.

Among the barriers of implementing the flexicurity model in Poland, some are of key meaning. Firstly, the flexicurity model is based on high level of social security of people who were made redundant. The unemployment benefit system in Poland, however, has long been a restrictive one, i.e. it deprives the unemployed from the right to benefit and the benefit level is low. Implementing the model would thus require a dramatic reorientation of the support system for the unemployed, whose funding would arise controversy. Secondly, the model is based on relatively poor protection of workplaces and various alternative forms of employment. On the contrary, protection of workplaces is popular in Poland, but flexible forms of employment have not yet become so yet. Experience of flexible employment, and particularly – the use of civil-law agreements (the so-called junk contracts) reveals a low degree of social acceptance of diminishing the meaning of permanent employment. Thirdly, the present system of education and trainings is not flexible enough and does not fully respond to employers' expectations of employees' qualifications. Also, given the existing conditions, young and elderly people would also be at risk. The latter would also suffer from the weak lifelong learning system, which is caused by demographic changes. Fourthly, the inefficiency of labour offices, and ineffective policy of employment promotion in Poland implicate the necessity of a fundamental reorientation of their operation.

All the indicated problems result from the specificity of the Polish labour market and point to the necessity of its complex reform. However, due to the specificity of both Polish and Danish labour market, the flexicurity model can serve as a point of reference for Polish reforms, but cannot be copied.

CONCLUSIONS

The conducted analysis of the features, assumptions, and constitutents of the flexicurity model show that the Polish labour market still suffers from a number of limitations which disable its potential implementation. They are of economic, institutional, legal and cultural nature. A high level of complexity of these limitations makes it impossible to copy the model and apply it on the Polish labour market. However, some of its elements can be applied in activities targeted at improving the efficiency of the active labour market policy.

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Katarzyna Mydlarz[11]

SUSTAINABLE DEVELOPMENT A CURRENT TREND FOR TIMBER SECTOR LARGE COMPANIES

Abstract: Large timber sector companies operating on Polish market for years have had their well-established position. They have sufficient financial resources, modern technological lines, use certified raw material, produce goods which quality and technical parameters do not differ from similar goods produced in other countries and very often they even exceed them. Those favourable conditions do not however mean that the companies themselves remain passive. It is the large companies, stable and with a well-established brand that carry the responsibility of setting trends for the whole sector. Very often large companies are the initiators of new ideas, solutions and continuous search for innovative products, improving their technical and qualitative parameters. They determine the direction of development as well as emphasize the necessity of introducing innovations, not just within technology of production but also management and company policy.

The aim of the article is to present the situation of large companies from timber sector, current trend as well as indicate the direction of their development.

Key words: timber sector, investments,

INTRODUCTION

In recent years a lot of attention in the public space is being devoted to innovations. Those however, are of special significance in production companies, where it's of key importance that each investment means an improvement in company's profitability. Thus companies aiming at improving financial indices secure themselves resources for investments. While investing, they are still looking for means to gain advantage over their competitors. They are looking for methods, which will allow them to reduce production costs, increase the profit, as well as work efficiency.

However, the constant striving for the improvement of economic parameters was in recent years reinforced by environmental triggers, whose role is gradually increasing. This fulfilment of environmental requirements is the factor which determines all activities of renowned producers from timber sector. Achievement of better financial results however complying with the rules of sustainable development begins to indicate the new direction for Polish companies also determined in „*Strategies of innovation and economic efficiency Strategie Innowacyjności i Efektywności Gospodarki*" as well as work programme for this strategy "Program for the development of companies till 2020 „*Programie Rozwoju Przedsiębiorstw do 2020 r.*". It's message is the support for business in areas of innovation and sustainable development [Raport 2014].

THE POSITION OF TIMBER SECTOR IN POLISH ECONOMY

Timber industry belongs to one of the most significant sectors of Polish economy. The share of sold production for the goods made of timber, furniture, paper and pulp in 2015 reached 8,9%, which proves its macro and micro-economic significance. Confirmation of the important position of companies from this sector for the economy is taking into account their growing demand for raw material in *National Programme for Increasing Afforestation Krajowym Programie Zwiększania Lesistości* by the year 2050. Assumptions of that programme indicate that for many years the level of afforestation has been gradually increasing. Over the recent years it grew from 28,8% in 2005 to 29,5 in 2015. Further growth prospects are also favourable and assume that the level of afforestation

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in our country will reach 30% in 2020 and 33% past year 2050. Therefore, it's a natural response to ever growing potential of timber sector.

Significant from the point of view of the analysis of sector enterprises is the fact that they are very versatile in terms of the level of employment, capital or turnover. Large and very big companies of timber sector constitute just 2,5% of all companies and they build up the core of Polish timber industry [Gruszczyński 2011]. It has to be however emphasized that within the group of these companies there are basic sawmills, as well as enterprises where timber raw material is being highly processed. Therefore, evaluating the whole sector one cannot overlook the differences between individual branches of this industry, their technical and technological potential, as well as investment or development possibilities [Ratajczak 2009].

Timber market is continuously demanding towards companies from timber sector. They however, concern the quality of manufactured goods and the ever higher efficiency of production. Simultaneously, a lot of attention is being devoted to the reduction of costs of production and the improvement of environmental parameters. Focus is drawn to the role of planned and implemented operations in order to maintain the strong position of companies. The situation of the whole sector is being evaluated from the perspective of undertaken investments emphasizing its influence on the overall economy.

Significant from the point of view of the company's potential is the improvement of economic indices, especially profitability and financial liquidity, to maintain a strong position on the domestic but mainly global market. As it may be concluded from the data presented in figure 1, companies from timber sector, skilfully use their potential aiming at constant increase in sales and the improvement in achieved results.

Table 1. Production of the main products

Products	2005	2010	2014	2015
Wood, wood and cork products, except furniture; Articles of straw and plaiting materials				
Sawnwood in dam3				
Particle board and similar board of wood or ligneous materials in dam3	2188	2404	2730	2700
Fibreboards of wood or ligneous materials	3940	4657	4790	4834
in km2	340	499	620	641
PAPER AND PAPER PRODUCTS				
Soda or sulphate chemical wood pulp other than for dissolving grades in thousand T	802	881	881	873
Paper and paperboard in thousand T	2699	3662	4221	4366

Source: Own-elaboration based on Statistical Yearbook 2016

Similar tendencies to those of the producers of timber and timber-based products, producers of wooden boards or pulp and paper producers are also visible in furniture industry where according to Central Statistical Office the value of production sold in January 2016 amounted to 3 046,6 million zł and was 10.8% higher than in the same period of 2015, and throughout the whole 2015 it reached the value of 39,1 million zł. [www.oigpm.org.pl]. It may be therefore concluded, that good economic situation in furniture industry stimulated growth of orders in related industries for example the production of wooden panels and sawmilling. Similar relationship concerns construction sector, the improvement of economic situation in this branch of industry determines proactive operations in the companies cooperating with timber industry. It indicates the relationship

and close cooperation of individual branches of timber sector. Hence, the strong position of both furniture industry and constructions determines the demands for the remaining participants of the forest-and-timber chain.

Specific nature of timber sector offers the possibility of optimal usage of timber raw material. It is obvious that through converting post-production residue into a full-value product, as well as recycling post-consumer wood or paper the volume and cost of primary raw material is being reduced. Thus launching modern technological and technical solutions very often requiers looking for possibilities of utilizing less valuable material. This type of solutions are used in the sector of wooden panels, pulp and paper industry, applied by companies participating in garden programme or those selling ecological sources of energy.

THE INFLUENCE OF INTERNAL AND EXTERNAL FACTORS ON TIMBER INDUSTRY

Condition of each company is determined by both factors related to the company itself as well as external factors, which are mostly beyond the control of producers or managers. Within the first group of factors there are, among others: financial condition of the company and its size, its human resources and their potential and motivation for undertaking the risk of introducing innovations. In each of these cases, the way in which the company will function will depend on the decisions taken within it, hence the skills, knowledge and experience of people employed by a given company. In case of external factors, independent from the company itself, decisive possibilities are significantly limited. Among those factors there are: competition, economic situation, state policy, as well as the pace of technological progress. Hence the process of managing the organization necessitates an accurate evaluation of risk. Such situation very often hinders the process of making investment decisions.

Prosperous companies have their own mission and vision, which they gradually, implement and all their plans and activities stay in line with those objectives. Sometimes however problems occur and they prevent achieving those earlier objectives. In case of companies from timber sector one of such problems might be purchase of raw material. The purchase of timber in companies from timber sector in Poland is multidimensional and not always predictable. Lack of possibility of including in the plans for the next year the cost of purchase of raw material significantly hinders taking any decisions. As it may be seen in figure 1, timber prices evolve depending on where the resources come from. The most stable prices may be found at forest and timber portal for timber sold by National Forests which each year offers a fixed volume of timber. However, the amount offered to the producers is not sufficient. Thus they are forced to supplement their stocks with raw material from portal e-drewno or with imported timber. In this case, differences in prices in subsequent years happen to be significant, which has an impact on the demand. Also smaller producers, for whom each increase in timber prices may drastically reduce production and significantly deteriorate its efficiency need to deal with this situation.

The above example shows that the main factor, which increases average timber price is the price from auctions at portal e-drewno.

Companies from timber sector due to a significant share of products which are exported adjust the standards of their products to foreign customers requirements. They pay particular attention to the selection of adequate materials used in the production and their certificates. Willing to meet the expectations of their clients they implement in the production process modern technological solutions, which through improving basic products parameters gradually expand the market. The result is high quality of produced goods, which is also beneficial for Polish consumers. Lower, in comparison with foreign companies, production costs facilitate competing with domestic producers in a given country, which also expands Polish companies order book. It is worth emphasizing that the presence of Polish companies on the foreign market also facilitates adopting European and

World-wide tendencies which then enter Polish market and gradually may be used in subsequently launched ideas.

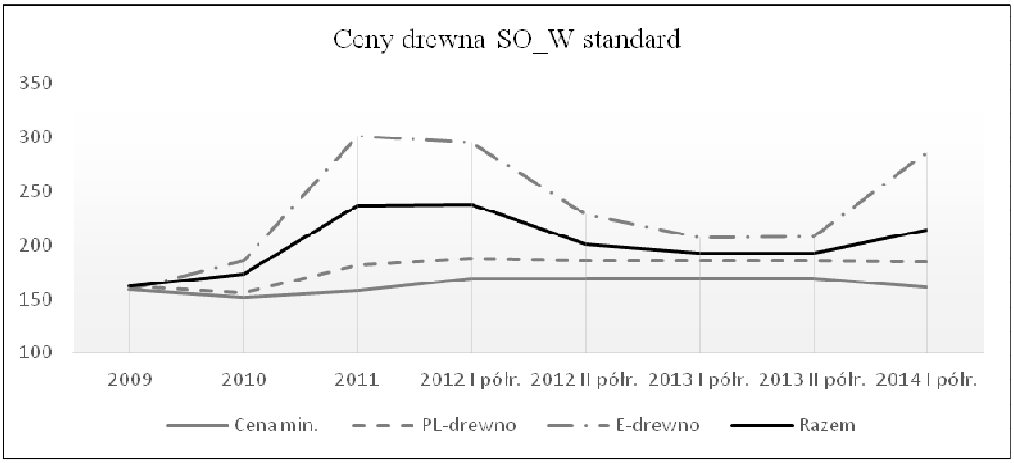

Figure 1. Pine wood prices offered to the producers from timber sector

Source: Own-elaboration based on www.leśnictwo.gov.pl

A thread for many companies which export a significant share of their production is linked to exchange rate differences, which directly influence company's profitability. Weak Polish currency increases this profitability while the strong zł means that even the increased export results in lower efficiency. The data provided by NBP (National Bank of Poland) indicates that from the beginning of 2016 apart from short periods of currency rate drops both euro and dollar remain strong. (euro oscillated between 4,24 zł and 4,49 zł, and dollar between 3,73 zł up to 4,13 zł. For means of comparison minimum euro exchange rate in August 2008 was 3,21 zł, a minimum dollar exchange rate in July 2008 was 2,02 zł) [www.nbp.pl]. This situation shows how significant differences in the income from sales may be achieved by those producing for export and how much a current economic situation influences their financial liquidity.

Among the companies, which export the significant share of their production there are those producing furniture. Taking into consideration the fact that that furniture industry is mainly exporting industry (Poland comes third in Europe right after Germany and Italy, as furniture export is concerned) rather low currency rate of Polish zł means higher income from sales. Similar situation may be observed among the producers of wooden-based panels and other goods made of timber or pulp and paper industry.

CONCLUSION

Economic target of all companies is achieving economic efficiency over the longest period of time. Developmental ability of a company is characterized by the ability to accumulate, condition and structure of its fixed capital, quality of human resources, entrepreneurship, propensity to invest or innovation ability. Thus it is important to obtain a moderately stable position on the market, which facilitates the accumulation of the stream of income and further development of a company.

Timber sector, especially its large companies, are among the more significant for Polish economy and they are still developing. The ability to create new products and market trends should be counted towards their unique abilities not just domestically, but also internationally.

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INCREASED SIGNIFICANCE OF LOWER QUALITY WOOD IN DOMESTIC WOOD TRADE

Abstract: In recent years there has been limited distribution and supply of wood. In consequence, there are attempts to optimise its rational use. The noticeable deficit and commonness of this raw material cause the search for different sources from which it could be acquired. Therefore, there is search for new applications of lower quality wood, which meets clients' expectations due to its availability and lower prices. The article analyses the possibilities and justifies the use of lower quality material for different mechanical purposes with simultaneous maintenance of appropriate quality of products.

Keywords: woodquality, medium-size wood, technological usefulness, wood prices

INTRODUCTION

In view of the current amounts of wood material acquired in Poland, the market demand for sawn materials and wooden products is not satisfied. Therefore, it is necessary to use the available supply of raw materials rationally. This situation is influenced by the current age structure and species composition of forests in Poland. In consequence, increasingly younger trees are being cut to use their wood for industrial purposes [Tomczak & Jelonek 2012]. They have different properties than the assumed parameters of mature wood acquired according to the forest thinning order. Regardless of the assumed rules of wood material acquisition and its classification, its age and habitat are decisive to the usefulness and properties of utility wood [Spława-Neyman 1998, Borecki & Dawidziuk 2011].

Attempts to fully meet the demand of the market of sawn wood materials and wooden products cause the search for new solutions in wood classification and sorting [Ślęzak 2006]. Due to the forecast increase in the demand for wood both in the sawmill industry [Ratajczak 2011] and other sectors, it is necessary to carefully monitor the annual limits of wood acquired in domestic forests. Therefore, it is necessary to use purchased material appropriately.

Timber efficiency is a basic technological indicator characterising the current production potential of sawmills. This determinant is a material efficiency indicator providing information about the degree of material use in wood processing in the enterprise. This indicator can be used in different ways connected with the selection of log quality and dimensions as well as the demand for raw material [Hruzik 2006].

An increase in the demand for materials and products combined with a simultaneous decrease in the supply of sawmill softwood is a problem which can be solved by extending the supply of materials by using thinner assortments, e.g. medium-size wood and wood for paper production. Rational wood processing, continuous improvements and introduction of new technologies are some of the measures that need to be taken to ensure cost effectiveness of production and abundance of material [Buchholz 1990, Hruzik 2006].

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Medium-size wood can be used as an alternative in order to partly meet the demand of the wood industry for mechanical processing of material. Improvement in the profitability of enterprises is the result of good economic effectiveness caused by favourable prices of this form of raw material. The price determines the demand for this form of round wood. Another aspect affecting the demand is lower quality requirements concerning products. It is possible to achieve by meeting clients' demands for finished products, which diverge from mature wood strength parameters and are meant for shorter periods of product using, such as garden architecture programmes or packaging products (cases, pallets, etc.). Manufacturers of timber for these purposes try to use medium-size wood rationally [Giefing 2004, Hruzik 2006].

The aim of this article is to verify the scale of processing medium-size wood from different sources of assortment for the wood industry in its broad sense. The procedure of analysing the reasons for using lower quality assortments for mechanical processing allows for differences in quality and efficiency resulting from the dimensions of round wood used. The economic aspect, which results from the market demand of other branches of industry, is a decisive factor determining the rationality of using this form of material.

TECHNOLOGICAL PARAMETERS AND USING LOWER QUALITY WOOD

Less valuable wood, aka lower quality wood, is characterised by technical parameters, physical and anatomical traits which limit the possibilities of its application, as compared with traditionally logged wood for industrial purposes. Thus, in most cases lower quality wood includes the wood which can also be classified according to the quality and dimension criteria used by the 'State Forests' National Forest Holding. Therefore, medium-size wood is defined as round wood with the minimum upper end diameter of 5 cm (without bark) and the maximum lower end diameter of 24 cm (without bark). This category includes the following assortments of wood:

S11 – poles – production of telecommunication poles
S10 –mine props – construction of drifts in mines, timber production
S2a – paper wood – cellulose production, board production
S2b – paper wood with a choice – pallet production (upper diameter without bark – more than 12 cm)
S3a – industrial poles – woodchip production
S3b – utility poles – fencing
S4 – fuel

Assortments S11 and S10 are a group of wood with a choice to be used in products with high quality and strength requirements. This wood is a valuable raw material in the wood industry but the value relations in acquired medium-size wood quality classes are similar to large-size wood.

The Polish Standard PN–91/D–95018 (Wood Material. Medium-Size Wood) and the Technical Requirements for medium-size wood for industrial and energy purposes [Regulation No. 33 and 34 of the Director of the 'State Forests' National Forest Holding issued on 17 April 2012] concerning wood trade divide medium-size wood into four main groups differing in quality and dimensions. Utility assortments group S2 includes group S2B with defined lesser curvature of wood for mechanical use. It is a basic raw material for package products such as flat pallets. Group S2A with round assortments for industrial use is colloquially called 'the paper group'. It is chiefly used by the industry manufacturing boards of wood origin. It partly provides raw materials for mechanical processing, including the preliminary sorting process. S3 assortments, chiefly in the form of poles with the thinner end minimum diameter of 5 cm, are successfully used by primary wood processing enterprises to manufacture shafts by means of reeling mills. Simultaneously, these assortments provide input material for industrial woodchip production to the industry manufacturing boards of wood origin and branches of the paper industry. S4 assortments, which are chiefly firewood, are

characterised by considerable qualitative and dimensional variability. This fact limits machine processing of this form of round wood [Gifing 2004].

Apart from lower quality wood, which is successively acquired by the 'State Forests' National Forest Holding as part of medium-size wood assortments, wood sold on the market also comes from areas of natural disasters and it is acquired by pruning, thinning or sanitary cutting. Wood from areas afflicted by natural disasters is considerably diversified in dimensions and technical parameters. This material is offered on the market after damage caused by wind, flood or fire. The possibilities to use this wood depend on the character of the disaster, the degree of damage done to wood and how long it was left in the forest. It is certain that large-size wood from areas afflicted by natural disasters should not be used as a constructional element or in any other places which require adequate strength parameters. However, it can be used in the industry manufacturing boards of wood origin or in the cellulose and paper industry on condition it is not biodegraded. Medium-size pinewood from areas afflicted by fire or degraded by insects can be used in its round or sawn form as mine props, chipboards or small-size packaging. Small-size wood with the lower diameter in the bark ranging up to 7 cm and minimum lengthof 1.5 m and medium-size wood S3a and b, large amounts of which are acquired in consequence of disasters, can be used for manufacturing products in the so-called 'garden programme'. This wood is used for production of different elements, which are pressure protected with chemicals. The wood which is to be impregnated must not have blue stains or humidity exceeding 60%. Small-size wood is used in a similar way. Rational use of wood from tree stands afflicted by disasters requires full coordination of actions taken by forest management and wood processing enterprises [Borecki et al. 2011].

Another example is wood acquired from pruning or sanitary cutting. Wood acquired by pruning is of little industrial significance. It comes from less common species of coniferous trees, e.g. Douglas fir-tree, and deciduous trees, e.g. poplar, hazel, willow, lime-tree, including fruit trees, e.g.plum, pear, cherry-tree. These are less common trees which usually grow along roads. For safety reasons they are systematically cut by commune and county authorities. Wood acquired from sanitary cutting comes from areas endangered by snagging or development of insects damaging trees. In consequence, these wood assortments are usually characterised by lower technical quality and diversified dimensional structure. Therefore, the use of these assortments in the wood processing industry is very limited. Wood acquired by thinning comes from individual trees or groups of trees, from tree stands where not only mature trees but also weaker ones are cut for sanitary reasons.

MEDIUM-SIZE WOOD ACQUISITION AND ITS ECONOMIC ASPECT

Medium-size wood, which is considered a lower quality material, has considerable potential (Table 1). Rational medium-size wood processing may result in high profitability of production thanks to favourable indicators of efficiency in consequence of much lower costs of material acquisition.

The material cost factor is in a way the main determinant of costs and in consequence, it also affects the profitability of wood processing enterprises (Lis 2010a, 2010b). In primarywood processing enterprises round wood and its delivery generates 60-80% of all costs of production. Therefore, reduction of this value is so significant to the overall economic balance of an enterprise. The compensation of some of the wood deficitwith medium-sizematerial has very positive effect on the share of costs and simultaneously, itnegatively reduces the index of material efficiency in thin wood assortment processing.

Table 1. Wood acquired between 2000 and 2014

Timber harvesting in years	2000	2005	2010	2011	2012	2013	2014
	thousand m^3						
In all	27659	31945	35467	37180	37045	37946	39742
Compact wood	26025	29725	33568	34877	34978	35796	37661
public forests	24593	28601	32325	33244	33629	34549	36135
private forests	1432	1124	1243	1633	1349	1247	1526
medium-sizewood material hardwood	3193	3959	4008	4128	4317	4427	4463
medium-sizewood material softwood	8507	10249	11982	12330	12212	12614	13341
medium-sizewood material longstem	833	701	542	502	449	413	388
small-sizewood material	1634	2220	1899	2303	2067	2148	2079

Source: The author's compilation based on Leśnictwo 2015

Table 2. The price structure of medium-sizewood material in 2015

No.	Softwood material	Type of wood	Price (zlotys per m^3)	Maximum price (zlotys per m^3)
1	S10	softwood	230	282,90
2	S2A	spruce	223	274,29
3	S2A	pine, larch	228	280,44
4	S2B	spruce	225	276,75
5	S2B	pine	320	394,21
6	S3B	pine, larch	210	258,30
7	S4	spruce	90	97,20
8	S4	pine, larch	100	108,00

Source: The author's compilation based onwww.handeldrewnem.pl

As results from direct comparison of the costs of large-size wood processing (Table 3), where the prices of sawmill wood WC0 ranged from 531 to 570 zlotys per m^3, the value of acquired comparable medium-size wood material ranged from54% to 69% of the value of valuable sawmill material (Table 2). The demand for this form of round wood increased due to the considerable difference in the value.

Table 3. Average prices of softwood sawmill assortments in 2015

No.	Softwood material	Type of wood	Average price in 2015 (zlotys per m^3)
1	WA0	pine	757,61
2	WA0	spruce	849,48
3	WB0	pine, larch	619,69
4	WBO	spruce	665,21
5	WC0	pine, larch	531,10
6	WC0	spruce	572,83
7	WD	pine, larch	378,58
7	S4	spruce	435,61

Source: The author's compilation based onwww.handeldrewnem.pl

The analysis of the wood market through the factors of wood supply and wood prices reveals that it is justified to process wood rationally. It is necessary to stress the fact that for manufacturers

who purchased lower quality material its lower costs cause the need to allow for technical costs of the investment, include additional technological operations and reduce the efficiency of wood processing. In consequence, it is necessary to adjust the parameters of processing to the requirements of products manufactured. However, this situation requires entrepreneurs' economic engagement and innovativeness.

SUMMARY

By investigating the technical properties of lower quality wood we can understand that it can satisfy the demand for wood material and simultaneously, it will rationalise the use of wood resources.

Studies on contemporary forms of medium-size wood assortments show that it is justified to use this type of wood for different purposes of mechanical processing. The possibility to use additional volume of raw material enables a 35% increase in the potential of softwood material and an increase of about 11% in the potential of medium-size hardwood used in mechanical processing.

It is justified to use this form of wood because in the technological process its quality and form are adjusted to clients' individual needs. It is significant to sort round wood accurately according to its quality and diameter because it enables enterprises to achieve rational indexes of processing efficiency.

Proven experimental research on medium-size woodshows that the lowest processing efficiency can be observed in groups of the thinnest wood. Simultaneously, it is necessary to confirm the fact that big diversification in the material diameters causes irregular and usually lower effects of processing. Additional verification of the economic conditions of processing medium-size wood of different forms and quality classes shows that it is justified to saw wood for industrial purposes, having eliminated rotten and excessively curved pieces before. Studies which have been conducted so far prove that it is necessary to continue verifying the process of qualitative and dimensional classification of round wood of domestic origin. The problem of sorting different wood quality classes into thickness groups according to diameter becomes significant because by adjusting the processing to wood diameters and by selecting thicker assortments it is possible to increase the profitability of sawmill production.

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PROCEDURE PROJECT „FMEA ANALYSIS" FOR THE COMPANY MANUFACTURING FURNITURE

Abstract: In the paper the design of the FMEA analysis procedure has been presented. It was prepared for the company producing furniture. The company is located in the Podkarpackie Province. As a part of the strategy managers implement an idea of continuous improvement. As a part of this work the pilot quality management tools and Lean Manufacturing are implemented. Now it is the time for formalization of these activities on the basis of the conclusions of previous work. The procedure presented in the work can also be used in other companies.

Keywords: FMEA, procedure

INTRODUCTION

In the conditions of the present times, to talk about reaching an effective and successful business organizations which delivers goods or provides services, it is essential to have an efficient and modern management system. System approach to management should support not only the success of the organization itself, but also bring benefits to all stakeholders, and therefore customers, owners, suppliers and society. Management of an organization includes many disciplines, and quality management is recognized as one of the most important. Quality management is the coordination of all activities related to management of the company, the quality, including strategy, goals, planning, supervision, guarantee and quality improvement. The system, which allows for the establishment of policy and quality objectives and also for an achievement of these objectives, is called the quality management system. One can enumerate a lot of quality management systems called to life for different branches, industries or corporations. Their common feature is the need for skillful process documentation in order to work with it, and thus reduce the number of errors.

One of the documents describing the processes are the procedures. The term procedure should be understood as a certain way of conducting an action or a process. Procedures are an integral part of the documentation of the quality system and provide information about how to perform a specific action. This procedure describes how to perform activities and interaction of individual organizational units in organizations that participate in the realization of the set objectives. The procedures apply to middle management. They are documents that represent the tactical level, to a large extent responsible for the processes of a continuous improvement in organizations.

The improvement can also be implemented through the quality management tools. One of them is to analyze the causes and effects of defects (Failure Mode and Effect Analysis - FMEA). It was developed in the USA for the needs of the defense industry in the late forties of the last century. The way the FMEA is conducted, is a highly planned and systematic procedure . It enables for:

- A reasonable selection of solutions while planning process,
- Detection of deviations necessary in a process or in a product,
- Recognition of the right control resources and an analysis in the process of product design, efforts in the company and in the production process,
- Reduction of the costs, including the costs of defects and improper prevention,
- Determination and elimination of unnecessary operations in the process, and as a result,

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- Shortening the duration of the process,
- Leads to increased satisfaction of internal and external customer. [1, 2, 3]

In order to have benefits from the skillful use of FMEA it is purposeful to establish procedures to analyze the causes and effects of defects, e.g. in a company producing furniture, as repeatable in the future the conduct of an analysis may translate into a higher quality of the process and the product.

PROCEDURE PROJECT: FMEA ANALYSIS

On the following pages based on [4] it has been shown the design process of FMEA for the analyzed company.

LOGO	**PROCEDURE**	**P12**	Page 1/5
	FMEA analysis		Edition 1

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TABLE OF CONTENT

THE PROCEDURE IS OWNED BY ..XX..

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1. Objective.

The aim of the procedure is to establish a series of basic actions to minimize or complete eliminate of thecauses of defects in the manufacturing process of furniture, by identifying potential defects and to propose and implement specific corrective measures.

2. The area of application.

This procedure applies to all production processes and product design processes, implemented inP.P.H. ..XX ...

3. Definitions and Abbreviations.

FMEA - Failure Mode and Effects Analysis)

Non-compliance - failure to meet the requirements.

Potential inconsistency (failure) - a potential defect which may arise in the life cycle of a product or process and which results in failure to meet the specific product requirements against it.

Potential cause of failure - a possible cause of the analyzed defects.

Potential effect of failure - possible by the appearance of defects.

4. Responsibility.

4.1. Director P.P.H. ..XX .. is responsible for the selection and appointment of a team of people involved in thework related to the FMEA analysis, including the FMEA leader (moderator). Director shall also evaluate the effectiveness of corrective actions taken.

4.2. Managers are responsible for the effective implementation of the proposed corrective actions and for the timely implementation of the tasks arising from the register of corrective and preventive actions.

4.3. FMEA project leader is in charge of coordinating the work of the working group, organizing meetings,preparing materials to assist in the design of FMEA, such as minutes of the inspection, reports of non-compliance, complaints from customers. The moderator is also responsible for refilling the FMEA forms and theregistry of corrective and preventive actions.

4.4. Members of the working group perform the tasks associated with the FMEA analysis and listen to the commands of the group leader.

5. Proceedings algorithm

6. Proceeding description.

6.1. First, the owner appoints a team consisting of no more than 6-8 people, who know the problems of theprocesses in the company (including employees of marketing, logistics). The owner appoints the project leader.

6.2. On the first day of work related to FMEA, the leader selects the object of research and defines the foundation for the implementation of a correct FMEA analysis. He also prepares the FMEA form where all thedata resulting from the analysis will be listed.

6.3. After selecting an object of research, the working group led by the leader carries out the decomposition ofthe product process and defines the functions of the product and the purpose of the process.

6.4. The team then determines for each operation all the possible potential errors. To identify potentialincompatibilities one needs to use the knowledge and experience of team members, data from the analysis of similar processes, research benchmarking protocols of control, reports of non-compliance and complaints fromcustomers. In the following days the working group identifies and analyzes all potential causes of disclosure oferrors. The identification is performed using quality management tools, e.g. the Ishikawa diagram. Then the teamdetermines the effects the detected failures cause (both direct impacts as well as from the point of view of thecustomer).

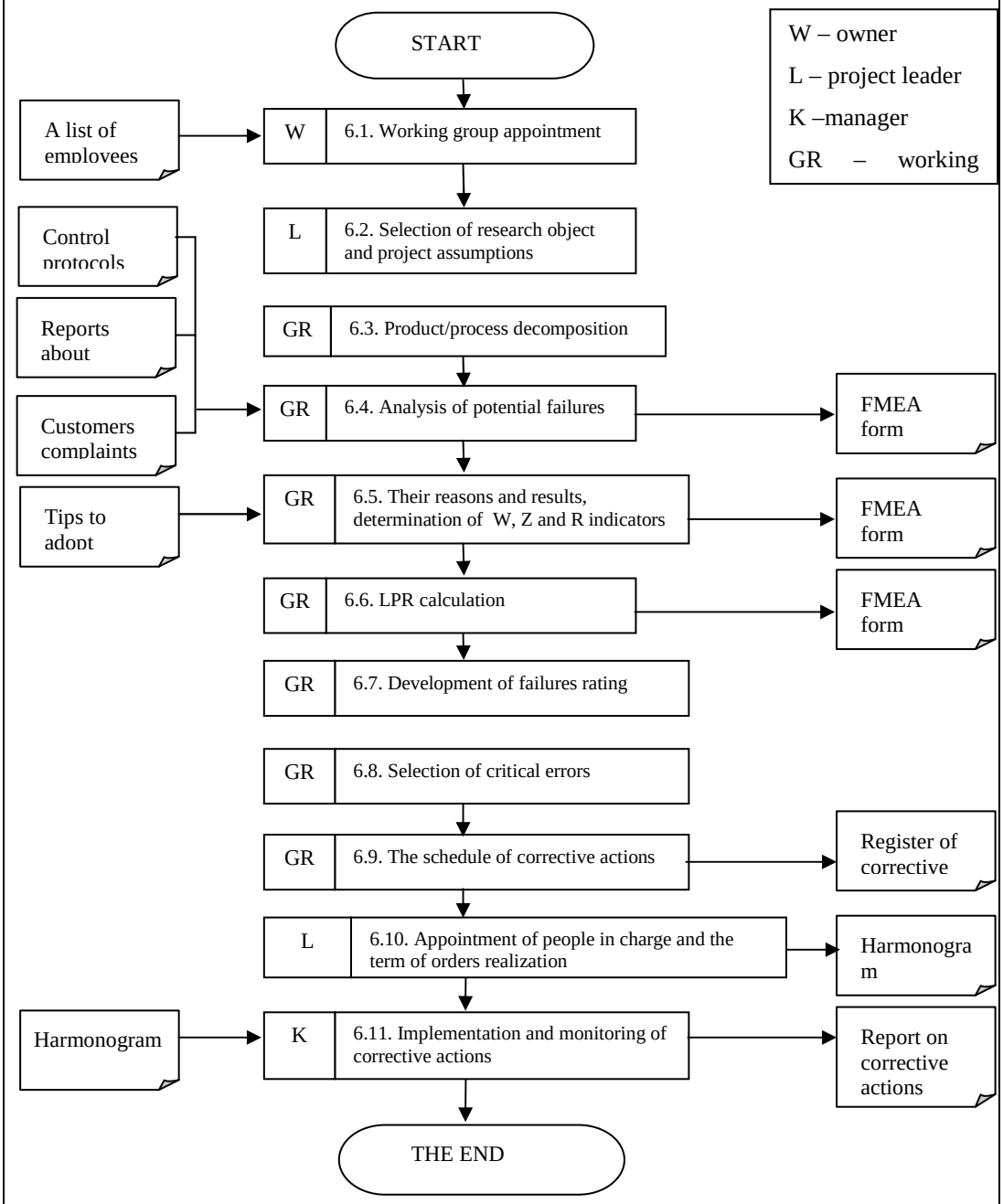
6.5. After identifying the failures, their causes and effects, the team co-chaired by the leader estimates indicatorsW, Z and R. The working group uses the instructions contained in the tables 6.5.1., 6.5.2., 6.5.3. determines foreach indicator corresponding number from <1-10>.

6.6. When the indicators are already estimated, the working group proceeds to calculate the number of priorityrisk LPR using the following formula:

$$LPR = W * Z * R$$

6.7. On the basis of the LPR numbers, the team determines the failures ranking in the order from largest to smallest LPR value.

LOGO	PROCEDURE FMEA analysis	P12	Page 3/5 Edition 1



LOGO	**PROCEDURE**	**P12**	Page 4/5
	FMEA analysis		Edition 1

6.8. After determining the hierarchy of incompatibility the team selects critical errors on the basis of a fixed LPR limit value included in the assumptions. In the case when the calculated number of priority risk for a particular non-compliance is higher than the set limit of LPR, then the incompatibility should be regarded as critical.
6.9. After defining the critical defects, FMEA team determines the appropriate preventive and corrective actions for all critical errors.
6.10. On the last day of work of the FMEA group, the leader determines the persons responsible for the proposed actions and sets deadlines for implementation of the recommendations.
6.11. After the proper FMEA analysis, the appointed manager implements and monitors corrective actions.

Table. 6.5.1. Indicators to estimate Z for P.P.H. ..XX...

Z	Failure significance	Description
1	Very low	The process failure does not affect the quality of the product
2-3	Low	The process failure causes a slight inconvenience
4-6	Average	The process failure causes difficulties, which requires the repair
7-8	Big	The process failure has a major impact on the production of non-conforming products
9	Very big	The process failure causes the inability to repair non-conforming products
10	Critical	The process results failure causes the production of products threatening the security of the user.

Table 6.5.2. Indicators to estimate W for P.P.H. ..XX...

W	Failure detection	Description
1-2	Very high	The process failure will certainly be detected
3-4	High	A big chance of detecting failures in the process
5-6	Average	Limited opportunity for detection of failures in the process
7-8	Low	High probability of undetected failures in the process
9	Very low	Very high probability of undetected failures in the process
10	Impossible	The lack of any opportunity to detect failures

Table 6.5.3. Indicators to estimate R for P.P.H. ..XX...

R	Failure existence	Description	Occurence frequency
1	Impossible	The failure of the process is almost excluded	1 na 10 000
2	Very rarely	Relatively very few process defects	1 na 1 000
3	Rarely	Relatively very few process defects	1 na 400
4-6	Average	Sporadic occurrence of defects in the process	1 na 80
7-8	Often	The failure of the process repeats cyclically	1 na 20
9-10	Very often	The failure of the process is almost inevitable	1 na 2

7. Enclosures.
-
7.1. FMEA form.

Enclosure 7.1. FMEA form.

No. of operation	Potential kind of failure	Potential failure results	Potential failure reasons	Z	R	W	WPR	Recommended correction actions

The developed procedure can be useful not only in one particular case, of the improvement of furniture in the selected company. It can be used for virtually any process. Earlier, however, the selection tables of priority numbers should be refined appropriately.

CONCLUSIONS

Thanks to procedurally documented FMEA, which helps meet the established quality parameters and their possible improvement, it is possible to increase the reliability of the product and customer satisfaction. Conflicts, misunderstandings and corrections are avoided, thus reliability of customer increases and the costs are reduced. Production processes are run efficiently, which allows to avoid errors with less manpower and resources even before the loss. Employees' motivation to work and responsibility for the products grow, employees realize the consequences of errors before they actually occur. FMEA provides aggravating arguments in the case of product liability, i.e. the evidence (written document) to ensure proper organization of the production and to ensure good quality of products, which allows to reduce the cost of quality. It should be noted that thanks to archiving of the filled FMEA sheets the plant increases the information resources that not only facilitate subsequent analysis of quality but also make it more reliable.

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REGIONAL AND NATIONAL OPERATIONAL PROGRAMS AS AN IMPORTANT SOURCE OF FUNDING FOR TRANSPORT POLICY IN POLAND IN 2004-2006 AND 2007-2013. ANALYSIS OF COMPLETED PROJECTS AND PROJECTS IN PROGRESS

Abstract: The following article summarizes the investments made in the area of transport policy in Poland over the past 15 years. Within such a typology 3679 projects implemented in 2004-2006 and 2007-2013 have been analyzed. Time periods were adopted according to the duration terms of the last two financial perspectives. In 2004-2006, 738 projects were completed with a total value of approx. 28.5 billion PLN, of which the amount of funding from the EU amounted to approx. 18 billion PLN. In 2007-2013 2945 projects were contracted for the implementation, of which 2549 that were due to September 2015 have already been completed. 396 projects are still in the implementation phase. In September 2015 the activities contracted for the transport policy were estimated at approx. 241.48 billion PLN value of total investment, including 136.86 billion from grants from the European Union. The total value of all the 3679 projects is approx. 270 billion PLN, of which the value of subsidies from the EU represents approx. 155 billion PLN, the value of subsidies from the state budget is approx. 27 billion PLN, and beneficiaries own contribution is approx. 88 billion PLN.

Keywords: transport policy, EU subsidies for Poland, financial perspective, projects, own contribution

INTRODUCTION

For Poland, the participation in the EU structures opened the way to the EU budget, so the state and the people can benefit from the Structural Funds (the European Regional Development Fund - ERDF and the European Social Fund - ESF) and the Cohesion Fund. They have become the main source of funding for regional and national operational programmess, within which a wide range of transport policy investments is being implemented.

The purpose of this article is to summarize the range of these investments, their number and value of projects and total funding received for their implementation from the European Union [Sikora-Gaca, Kosowska, 2014]. Within such a typology we have analyzed 3679 projects implemented between 2004-2006 and 2007-2013. The time periods were adopted referring to the duration terms of the last two financial perspectives.

Projects were not qualified according to their types, so the object of this study has been focused both on the projects carried out on an individual basis or competition, as well as system projects. Data were obtained from a nationwide map of subsidies [MIiR 2015] maintained by the Ministry of Infrastructure and Development. The article presents the state of implementation of investments within the transport policy from 2004 till September 2015. Comparative analysis has been used as the test method.

TRANSPORT POLICY IN THE FINANCIAL PERSPECTIVE OF 2004 – 2006

In the years 2004-2006, Poland received 8.6 billion EUR grants from the Structural Funds and 4.2 billion from the Cohesion Fund. At that time the first operational programs were also launched: 1) Sectoral Operational Programme "Increase of Competitiveness of Enterprises" (1.25 billion euros), 2) Sectoral Operational Programme "Human Resources Development" (1.47 billion euros),

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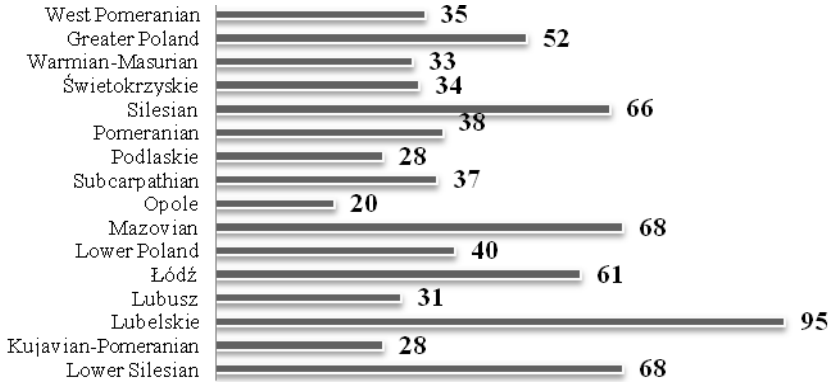
3) Sectoral Operational Programme for "Restructuring and Modernisation of the Food Sector and Rural Development" (1.19 billion euros), 4) Sectoral Operational Programme "Fisheries and Fish Processing" (0.2 billion euros), 5) Sectoral Operational Programme on Transport (1.16 billion euros), 6) Integrated Operational Programme (2.53 billion euros from the ERDF and 0.43 billion from the ESF), 7) Operational Programme on Technical Assistance (0.28 billion euros) [MRR 2011]. The INTERREG III and EQUAL initiatives established separate funding. In 2004-2006 in Poland, nearly 90.000 projects [Sikora-Gaca, Kosowska, 2014] in various fields were submitted, of which approx. 30% were qualified for implementation.

In the area of transport policy in 2004-2006 we implemented 738 projects with a total value of approx. 28.5 billion PLN, of which the amount of funding from the EU amounted to approx. 18 billion PLN. This means that approx. 10.5 billion was the state's own contribution to its investments (resources of beneficiaries). All of the 738 projects are already completed, therefore the financial data defining their scope and level of implementation have a constant and unchanging form. The number of projects by provinces is shown on Figure 1.

Figure 1. Number of projects in transport policy, contracted for implementation in 2004-2006 according to the division into provinces.

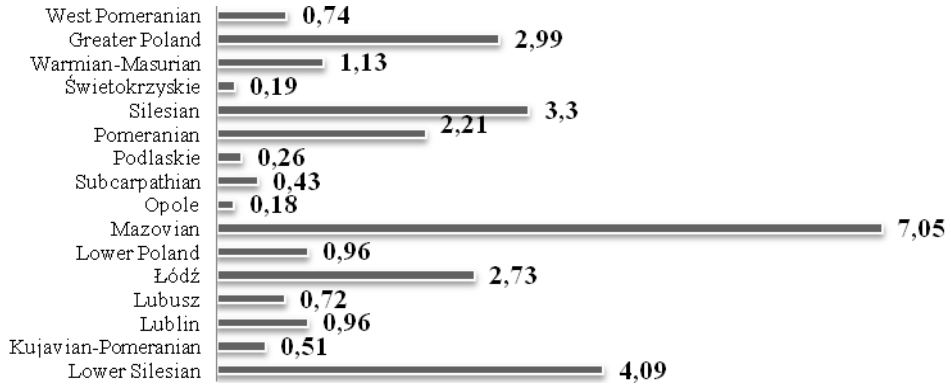


Source: own study based on MIiR, www.mapadotacji.gov.pl (available: 15.09.2015).

Most of the projects were submitted by the Lublin Province – 95, followed by the Silesian, Mazovian, Łódź and Lower Silesia Provinces, respectively – 66, 68, 61 and 68. The Greater Poland (Wielkopolskie Province) implemented 52 projects. In the remaining regions fewer than 50 projects were implemented, with the fewest in Opole - 20. Figure 2 shows that the value of funds collected for projects is not directly proportional to the number of applications submitted. This applies both to the financial perspective of 2004-2006 and 2007-2013.

The greatest value was acquired projects in the Mazovian Province – 7.05 billion PLN and Lower Silesia – 4.09 billion PLN. In the Silesian Province the value of the investments in transport policy amounted to 3.3 billion, in Greater Poland 2.99 in Łódź 2.73, 2.21 in the Pomeranian Province and in Warmia and Mazury 1.13 billion PLN. In other provinces, the expenditure on transport policy in 2004-2006 did not exceed one billion. In Świętokrzyskie and Opole Provinces the expenditures on transport policy were the lowest. A detailed data for the years 2004-2006 is presented in Table 1.

Figure 2. The total value of projects in the field of transport policy, contracted to be implemented in 2004-2006 according to the division into provinces (billion PLN).



Source: own study based on MIiR, www.mapadotacji.gov.pl (available: 15.09.2015).

Among the examples of the categories of intervention, which the completed projects concerned, we can name: the reconstruction of the municipal, county, provincial and arterial roads, the expansion, upgrades and repairs of roads, roundabouts, streets, street complexes, bridges, the optimization of communication systems, construction of noise barriers, the integration of communication networks, improving the performance of passenger rail transport, the modernization of rail lines and fleet, rail buses purchase and the modernization of electric traction units.

Table 1. The European Union grants awarded to projects in the field of transport policy, contracted to be implemented in 2004-2006, according to the division into provinces (billion PLN).

No.	Province	Value of projects in bn PLN	Value of UE grants in bn PLN
1	Lower Silesian	4.09	**2.78**
2	Kujavian-Pomeranian	0.51	**0.31**
3	Lublin	0.96	**0.64**
4	Lubusz	0.72	**0.48**
5	Łódź	2.73	**1.56**
6	Lower Poland	0.96	**0.52**
7	Mazovian	7.05	**3.86**
8	Opole	0.18	**0.12**
9	Subcarpathian	0.43	**0.3**
10	Podlaskie	0.26	**0.16**
11	Pomeranian	2.21	**1.3**
12	Silesian	3.3	**2.19**
13	Świetokrzyskie	0.19	**0.14**
14	Warmian-Masurian	1.13	**0.76**
15	Greater Poland	2.99	**2.24**
16	West Pomeranian	0.74	**0.49**

Source: own study based on MIiR, www.mapadotacji.gov.pl (dostęp: 15.09.2015).

In the group of 738 projects, 15 projects are nationwide, involving five major beneficiaries: Polish State Railways Polish Railway Lines, SA (8), PKP (PSR) Regional Services Ltd. (2) The

General Directorate for National Roads and Motorways (3), the National Fund for Environmental Protection and Water Management (1) and the Ministry of Transportation (1). A detailed list of nationwide projects for the period 2004-2006 is presented in Table 2.

Table 2. Nationwide transport policy projects in the 2004-2006 financial perspective.

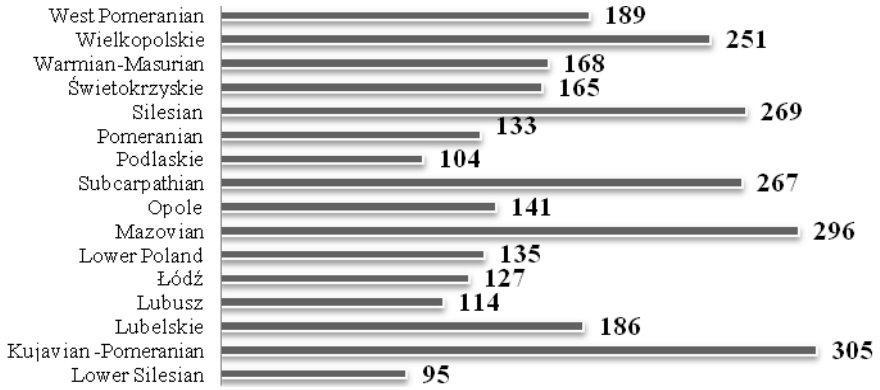
Project's title	Beneficiary	Value of project [PLN]	EU grant [PLN]
The improvement of the railway infrastructure in Poland - „bottlenecks"	Polish State Railways, Polish Railway Lines	678923387.2	475107711.8
Modernisation of railway line E59, section Wroclaw – Poznań	Polish State Railways, Polish Railway Lines	78801893.29	108800850
"Modernization of EMUs series EN57"	Polish Regional Railways	164715042.6	67387000
Support for the General Directorate for National Roads and Motorways in the preparation and implementation of projects co-financed from EU funds in the 2007-2013 budget perspective	General Directorate for National Roads and Motorways	62869375.73	54400425
Support for preparation of the project of modernization of railway line E-65, section Warsaw - Działdowo – Gdynia	Polish State Railways, Polish Railway Lines	48762194.28	35840212.79
"The modernization of carriages with seats of UIC-Y types: 111A, 112A and YB"	Polish Regional Railways	72296188.64	28143824
Preparation of the A4 motorway construction project, section Zgorzelec-Krzyżowa	General Directorate for National Roads and Motorways	26861489.25	21200165.62
Support for the process of preparation and implementation of projects financed under the SFs in the road transport sector	General Directorate for National Roads and Motorways	24480595.51	16640130
Modernization of the railway line CE-59 Międzylesie - Wroclaw - Kostrzyn - Szczecin, preparation of documentation of pre - stage I	(Polish State Railways, Polish Railway Lines	11429401.29	14227524.48
Support for the preparation of railway line modernization project (E-20 and CE-20) - Other works	Polish State Railways, Polish Railway Lines	11514969.96	12000093.75
Support for the preparation of the modernization of the railway line E 65 Grodzisk Mazowiecki - Katowice - Zebrzydowice / Zwardon - the state border, Stage I	Polish State Railways, Polish Railway Lines	15003479.82	11784625.4
Support for preparation of project "Modernization of the railway line E 30 / CE 30 section Opole-Katowice-Kraków"	Polish State Railways, Polish Railway Lines	16042792	11520090
Support for preparation of the project of modernization of the railway line E75 section Warsaw - Bialystok - Sokolka - Trakiszki (Rail Baltica)	Polish State Railways, Polish Railway Lines	7841353.63	8192064
Assistance in the preparation and implementation of railway projects co-financed by the Cohesion Fund	Ministry of Transportation	4096798.09	7253390
		1223638961	872498106.8

Source: own study based on MIiR, www.mapadotacji.gov.pl (available: 15.09.2015).

EXPENDITURE ON TRANSPORT POLICY IN 2007-2013

The total EU assistance for 2007-2013 was approximately 67.9 billion euros. Some projects are still being implemented, which means that the final amount of the support can be changed (annexes to the schedules, cost changes, the difference between the spending contracted and actually realized). Most of this amount comes from the European Regional Development Fund, which financed all the Operational Programmes (OP) in 2007-2013. The exception was the OP Infrastructure and Environment, which had an additional funding source - the Cohesion Fund, and the OP Human Capital, which supplied the funds from the European Social Fund. Operational Programme Infrastructure and Environment, together with the Regional Operational Programmes, are the two main funding areas of transport policy in Poland in the years 2004-2006 and 2007-2013 [Sikora-Gaca, Kosowska 2014]. The dimension of EU subsidies is even more important as they are non-refundable aid. In the next financial perspective of 2014-2020 refundable funding mechanisms will be more popularized among the beneficiaries, which will eventually have to ensure the circulation of funds within the Member States.

Figure 3. Number of projects in transport policy, contracted for implementation in 2007-2013 according to the province division.



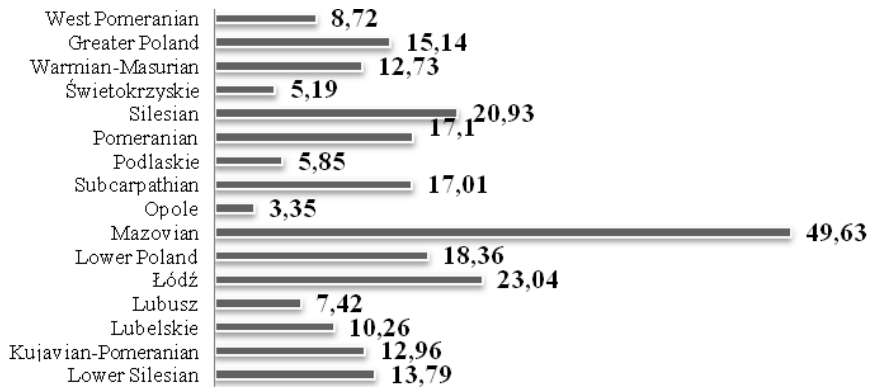
Source: own study based on MIiR, www.mapadotacji.gov.pl (available: 15.09.2015).

The Operational Programme Infrastructure and Environment 2007-2013 consisted of the following priorities [MRR 2009]: 1) water and sewage, 2) waste management and protection of the earth's surface, 3) resource management and counteracting environmental risks, 4) adjusting enterprises to environmental protection requirements 5) protection of nature and promotion of environmental awareness, 6) road and air network TEN-T, 7) environmentally friendly transport, 8) transport safety and national transport networks, 9) environmentally friendly energy infrastructure and energy efficiency, 10) energy security, including diversification of energy sources, 11) culture and cultural heritage, 12) health safety and improving the efficiency of health system, 13) the infrastructure of higher education, 14) technical assistance - ERDF, 15) support - SF. In the 2007-2013 financial perspective the greatest number of applicants filed documents in the field of environmental projects [POIS 2014], however, transportation projects were the ones that reached the highest value [Sikora-Gaca, Kosowska 2014]. In addition, within the Regional Operational Programmes, each province determined their own priority axes in which investments were made in

transport policy. The scope and extent of these investments depend on the actions identified for implementation by respective regional governments.

In 2007-2013 2945 projects were contracted for the implementation (which means that agreements with the beneficiaries were signed), with 2549 of which have already been completed till September 2015. This means that 396 projects remain in progress. In September 2015, the activities contracted within the transport policy were estimated at approx. 241.48 billion PLN of total investment value, including 136.86 billion grants from the European Union. This amount may be changed due to the ongoing implementation of the already mentioned 396 projects (Figure 5). A detailed list of projects from each province, as to the number of projects is presented in Figure 3, and for their values see Figure 4.

Figure 4. The total value of projects in the field of transport policy, contracted to be implemented in 2007-2013 according to the division into provinces (in billion PLN).



Source: own study based on MIiR, www.mapadotacji.gov.pl (available: 15.09.2015).

In the 2007-2013 financial perspective the most projects were approved for implementation in Kujavian-Pomeranian- 305, Mazovian - 296, Silesian - 269, Subcarpathian - 267 and Greater Poland - 251. It also means that the authorities of these regions, both at regional and domestic level, work the most effectively. In the remaining regions Intermediate and Managing Institutions approved to implement fewer than 200 projects, with the last place in the ranking taken by Lower Silesia - 95.

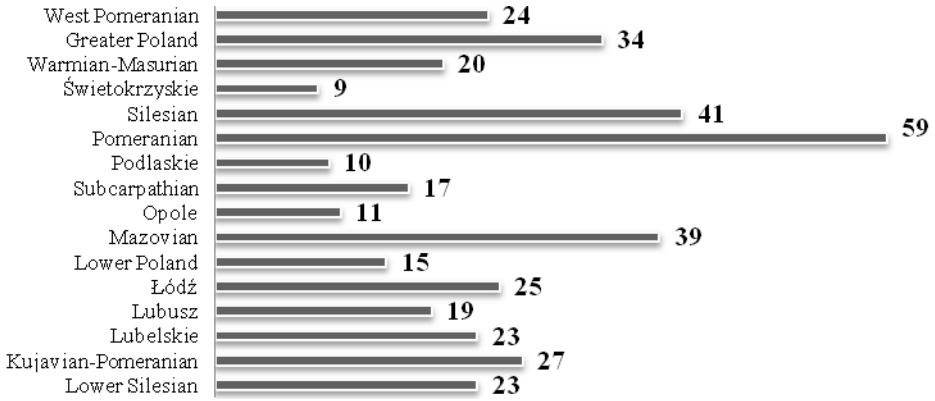
In 2007-2013, as in the previous financial perspective, the greatest amount of funds was acquired by the projects in the Mazovian Province - 49.63 billion PLN. Expenditures on transport policy in the Łódź Province amounted to 23.04 billion PLN and to 20.93 billion in the Silesian Province. In other provinces the grant agreements signed with the beneficiaries did not exceed 20 billion PLN, of which the lowest rate in this area was achieved by the Opole Province - 3.35 billion PLN.

Projects implemented by the EU get additional points if they involve the creation of new jobs, counted in full working units ("full-time"). It is estimated that by the end of 2015, within the OP Infrastructure and Environment, 4 771 EPC will be created - newly created jobs [Sikora-Gaca, Kosowska 2014]. In the grant application they are expressed by product indicators - Number of jobs created directly and the result [POIS 2014] - Estimated total number of direct jobs created.

Based on data from the 2007-2013 financial perspective, an interdisciplinary scope of intervention in the regional, economic and social sphere should be emphasized. Another chance for Poland are the years 2014-2020, during which the new operational programmes will operate. This is

the time in which applicants should intensify their application activity in the area of transport policy. It should be emphasized that the implementation of many projects is still in progress (Figure 5), meaning that the measurable effects of granted subsidies are not yet seen in their full extent. *Innovation Union Scoreboard* [European Commission 2013] defines us as "modest innovators", because the benefits of the implementation of the 2007-2013 financial perspective is to be expected in subsequent years.

Figure 5. Number of projects in transport policy, unfinished, contracted for implementation in 2007-2013 according to the division into provinces (as of 09.2015).



Source: own study based on MIiR, www.mapadotacji.gov.pl (available: 15.09.2015).

Table 3. The value of European Union grants awarded to projects in the field of transport policy, contracted to be implemented in 2007-2013 according to the division into provinces (million PLN).

No.	Province	Value of projects in ml PLN	Value of UE grants in ml PLN
1	Lower Silesian	13.79	**8.41**
2	Kujavian-Pomeranian	12.96	**6.97**
3	Lubelskie	10.26	**6.67**
4	Lubusz	7.42	**4.75**
5	Łódź	23.04	**12.74**
6	Lower Poland	18.36	**9.06**
7	Mazovian	49.63	**24.8**
8	Opole	3.35	**2.22**
9	Subcarpathian	17.01	**9.61**
10	Podlaskie	5.85	**3.4**
11	Pomeranian	17.1	**10.1**
12	Silesian	20.93	**12.25**
13	Świętokrzyskie	5.19	**3.35**
14	Warmian-Masurian	12.73	**8.11**
15	Greater Poland	15.14	**9.01**
16	West Pomeranian	8.72	**5.41**

Source: own study based on MIiR, www.mapadotacji.gov.pl (available: 15.09.2015).

In 2014-2020, even more funding in the form of non-repayable and repayable grants with the value of 68.2 billion will flow into Poland. Distribution of funds will be based on national and regional operational programs, and the latter will gain in importance. OP Infrastructure and Environment will be duplicated. For priorities implemented in this scope 24.2 billion euros will be allocated (about 4.1 billion euros less in comparison with the financial perspective of 2007-2013). OP Infrastructure and Environment will continue to be funded from two sources: the European Regional Development Fund and the Cohesion Fund.

CONCLUSION

European funds are present in many areas. Thanks to them, many changes have occurred, the range of investments, innovation and modernization has increased, the development gap between Poland and the EU has been reduced. These are the tangible benefits of Polish accession to the European Union. In 2004-2006 and 2007-2013 a total of 3679 projects were implemented in the field of transport policy. The leaders in terms of the number of projects over the last 15 years are the five provinces: Mazovian (364), Silesian (335) Kujavian-Pomeranian (333), Subcarpathian (304) and Greater Poland (303). Followed by three more provinces: Lublin (281), West Pomeranian (224) and Warmian-Masurian (201). Fewer than 200 projects were implemented in the remaining regions, of which the lowest number was recorded in Podlaskie - 132. The total value of 3679 projects is approx. 270 billion PLN, of which the value of subsidies from the EU represents approx. 155 billion PLN, the value of subsidies from the state budget is approx. 27 billion PLN and the own contribution of the beneficiaries is approx. 88 billion PLN.

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Lidia Jabłońska-Porzuczek, Joanna Smoluk-Sikorska, Sławomir Kalinowski[19]

THE CONDITIONS OF COMPETITIVENESS IN THE CONFECTIONARY AND BAKERY INDUSTRY

Abstract: The paper presents the results of research conducted in 2015 on 77 enterprises located in wielkopolskie voivodship operating in the confectionary and bakery industry. The investigation concerned external and internal factors of competitiveness occurring in the inquired companies. The results of the research show that fiscal policy of the state has the greatest importance in the business environment. Quality of devices and products, company's image as well as customer service are the most significant internal factors determining firm competitiveness. Entrepreneurs also pay attention to the intellectual capital and employees' knowledge.

Key words: confectionary and bakery industry, competitiveness, external factors, internal factors

INTRODUCTION

Market economy is characterised by continuous rivalry between economic operators. The results of the market game influence gaining and maintaining enterprise position on the market [Zielińska-Chmielewska 2012]. Market changes, progressing globalisation, clients requirements contribute to searching for modern sources of competitive advantage. It is possible to achieve by skilful company management, use of competitiveness potential and reaction to activities undertaken by other operators. Enterprises should conduct evaluation of market position analysing both external and internal environment directly influencing competitiveness. Internal factors are the activities carried out by a company, which link with production profile, profitability, the amount of capital, assets, product quality. In turn, external conditions are a derivative of conducted state policy and they include economic situation, inflation, regulations, financial and tax system [Walczak 2010, p. 4].

The aim of the paper is to indicate the most important external and internal factors influencing competitiveness of companies operating in confectionary and bakery industry and their importance for company's competitiveness improvement.

MATERIAL AND RESEARCH METHODS

In order to obtain opinions on factors influencing competitiveness of companies operating in confectionary and bakery industry, in 2015 an inquiry research was conducted among 77 enterprises in wielkopolskie voivodship. While choosing companies to the investigation, the purposeful selection was applied. The inquiry questionnaire consisted of 17 questions, among which there were questions concerning general information on a company, evaluation of competitiveness elements, particularly international, business and market environment. The part about internal conditions was an important element of the inquiry, especially capital and physical resources, production potential as well as factors in product, selling and distribution sphere. The gathered opinions had evaluative and subjective character. The investigation covered companies operating in NACE 10.71. Micro- and small enterprises dominated in the group of the investigated companies. It was respectively 35.1% and 37.7%. Every 11th enterprise employed more than 250 workers. The inquired enterprises had mainly local character (71.1%), every tenth domestic one and less frequently international one (9.2%).

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As the research shows, micro- and small enterprises in vast majority (respectively 92.6% and 82.8%) had local character, exclusively two enterprises employing up to 9 people indicated that their production is also destined for domestic market. The bigger the enterprise is (employs more people), the lager its territorial operating range is. Among large companies the international market dominates, in turn, among medium companies – at least the regional one.

THE ESSENCE OF COMPETITIVENESS

Competitiveness of enterprises is not a clearly defined notion. Trials of its determination occur in a number of scientific papers. Each author perceives it a bit different, emphasizing its other aspects. According to Pierścionek [2003, p. 164-165] *"the concept of 'competitiveness' is commonly used in theory and practice regarding to different types of entities, sectors, national economy, products, their particular features, resources, skills, management systems and their characteristics, information, structures, procedures, strategies". "Competition from the economic point of view is a battle of subjects (rivalry) for maximizing economic benefits, obtained from product selling (commodities and services) as well as a battle for supply sources (cheaper and higher quality) and labour (better, cheaper)"* [Skawińska 2011, p. 30]. According to Gorynia [2009, p. 50], *"competitiveness is understood as a skill to compete and so operate and survive in competitive environment"*. In turn, Świtalski, citing Flejterski's definition underlines complexity of competition processes, because *"competitiveness is understood, broadly speaking, ability to project, produce and sell commodities, which prices, quality and other features are more attractive than corresponding features of commodities offered by competitors"* [Flejterski 1984, p. 39; cited in: Świtalski 2005, p. 166].

According to Stankiewicz [2000, p. 79] enterprise competitiveness should be considered as a system consisting of competitiveness potential, competitive advantage, tools of competing and competitive position.

Competitiveness potential covers material and physical resources of a company, competences and skills enabling achieving competitive advantage [Stankiewicz 2000, p. 79].

Competitive advantage of enterprise is based on having competences, better than competitors, determining success in a given activity. The grounds for competitive advantage are its sources defined as an additional value, that may be produced by a particular enterprise for its purchasers (e.g. lower price, higher quality, availability) [Skawińska 2011, p. 59, 64].

Tools of competing cover instruments and methods used for creating customers capital and company's value. One may name quality and price of product, elasticity in product adjustment to clients' needs, product range, advertisement, promotion, aesthetics and ergonomics of packages, including unique shape, colour, brand traceability [Prus, Berg 2013, p. 236], company's image, payment terms [Stankiewicz 2000, p. 79; Gorynia 2009, p. 55].

Competitive position is a result of competing, an effect of applied competitive strategy in relation to competitive potential [Gorynia 2009, p. 58; Stankiewicz 2000, p. 79].

Competitiveness of an enterprise is influenced by many other factors. Pierścionek [2003, p. 166] distinguished:

- real sphere factors – labour resources, equipment and devices, technologies, products, financial resources,
- regulation sphere factors – organisational, legal, ownership forms, enterprise internal macrostructure management system microstructure.

In turn, Mantura [2002, p. 90-91] divided factors of enterprise competitiveness into internal ones (material, physical, human and financial), resultant (products, distribution, promotion and economic factors of market exchange) as well as external ones (stakeholders, quality). The internal factors, which decide on competitiveness potential, i.e. competitive opportunities, influence

resultant factors and these factors form the company's environment. The analysis and evaluation of resultant factors is conducted taking into account the external factors.

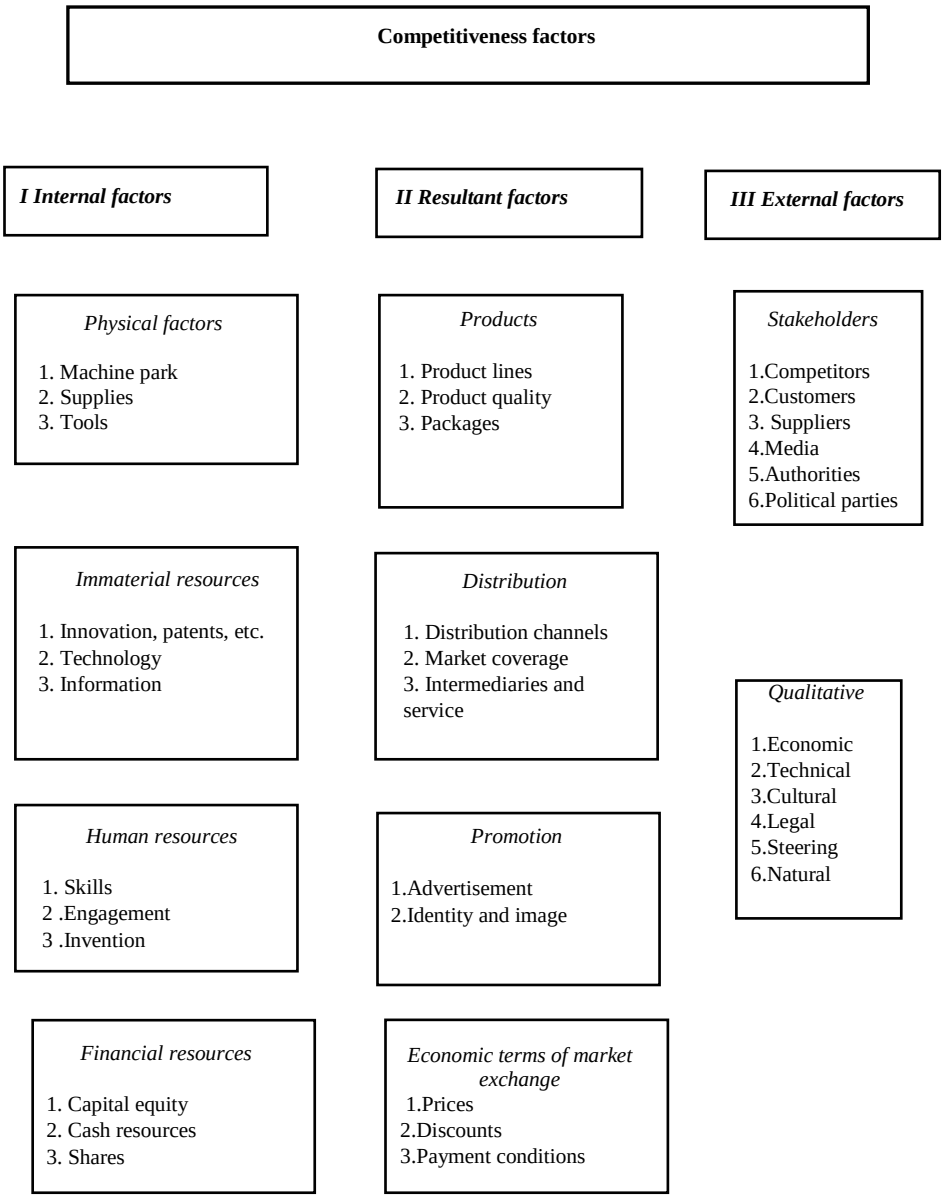

Figure 1. Classification of enterprise competitiveness factors

Source: Mantura W. (2002), Identyfikacja czynników sukcesu i konkurencyjności przedsiębiorstwa [in:] Problemy wdrażanie strategii rozwoju województwa wielkopolskiego, Skawińska E. (ed.), PTE Oddział w Poznaniu, p. 91.

RESEARCH RESULTS

Nearly half of the enterprises indicated high, and almost every third – very high, competition intensity in the branch. Awareness of great competition is strengthened together with size of enterprise and territorial range of activity. The larger enterprise is and the larger territorial range has, the greater sense of high or very high competition intensity is. Lower sense of high or very high intensity in the group of small enterprises may be explained by their narrower offer or local operation and the habit of local purchasers to the presented offer. On the other hand, one of the reasons for lower awareness is the fact that the market analyses are conducted occasionally. It is worth to mention that companies rarely carry out the evaluation of their position in relation to competitors – only 29.9% conducted such activities. Even if they perform such analyses, in vast majority they are done not more frequently than every six months. The research proves that larger companies more often conduct evaluation of their position – over half of the large and almost half of the medium ones and every fourth in the group of the small enterprises. The reason for such situation is the fact that small local firms usually do not have sufficient funds to carry out such analyses, therefore their evaluation is mainly based on a subjective sense.

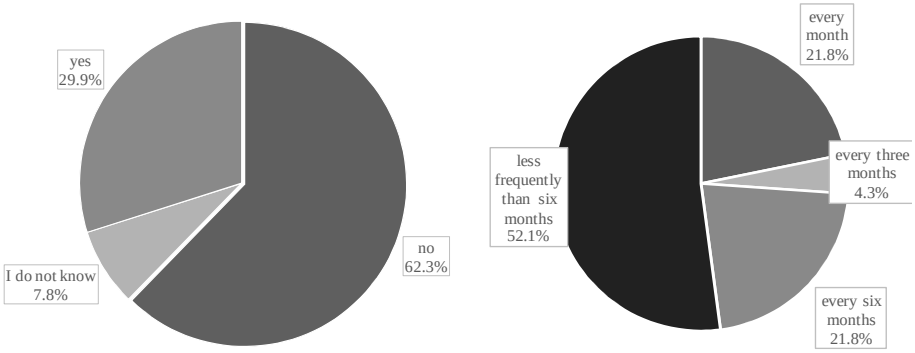

Figure 2. The evaluation of company's position in relation to competitors

Source: authors' own research.

As the entrepreneurs indicate, the competitiveness of their companies is mainly influenced by fiscal policy of the state (59.7%) and the level of the economic growth (40.3%), and slightly by interest (7.8%) and inflation rates (10.4%). Rare indications at the last two political-economic factors in the business environment may be explained by the lowest levels of the rates in history – both inflation and interest. What is interesting, none of the respondents indicated at high importance of cooperation with academic units. It is worth to mention that small enterprises more often than others indicate at significance of the state fiscal policy (65.5% indicated their high influence), in turn, large ones – at economic growth level (57.1%). Medium and large companies indicated at high importance of unemployment rate (respectively 50% and 85.7%). Falling unemployment, thus limited resource of qualified labour, is particularly dangerous for large firms, especially in situation of slight migration within the country and low mobility of workers. The research proves that large companies do not sense the influence of the interest rate on their competitiveness. On one hand, it may suggest their good financial condition and lack of necessity for taking credit and on the other, limited lending, which means weakening of investment in the inquired enterprises.

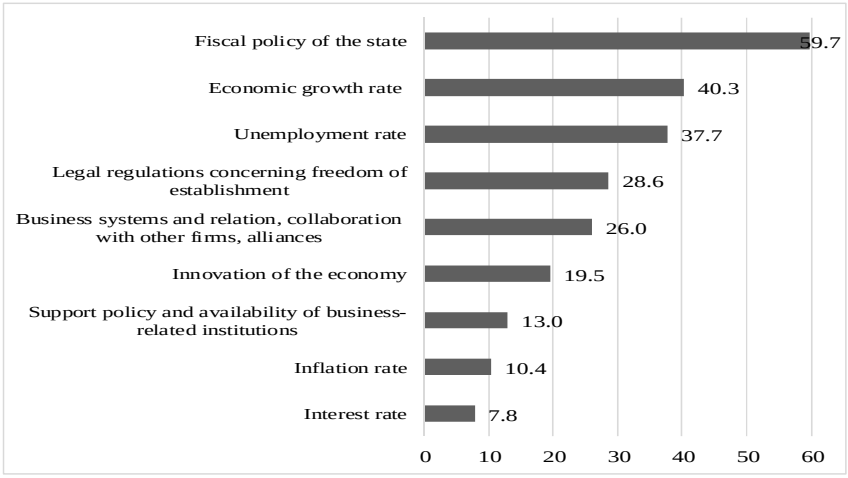

Figure 3. The influence of business environment on company's competitiveness (%)

Source: authors' own research.

The production potential and physical resources have important meaning for competitive position of enterprises. In this area, the respondents most often indicate at quality of devices (61%) and modern technologies (55.8%). Microenterprises name, beside quality of devices and modernity of technologies (respectively 66.7% and 44.4%), continuity of collaboration with providers (59.3%) and availability of raw materials (40.7%). Small enterprises, besides quality of devices and modernity of technologies (51.7% and 55.2),indicate at possibilities of production capacity development and investment activity (both 41.4%). In turn, for medium enterprises, possibilities of production capacity and continuity of collaboration with providers are equally important (respectively 50% and 42.9%). The analysis of enterprises' production potential shows that the respondents occasionally see the competitive potential in greening of production processes (14.3%) and know-how (10.4%). It is worth to mention that none of the large enterprises considered the greening as a significant factor of competitiveness.

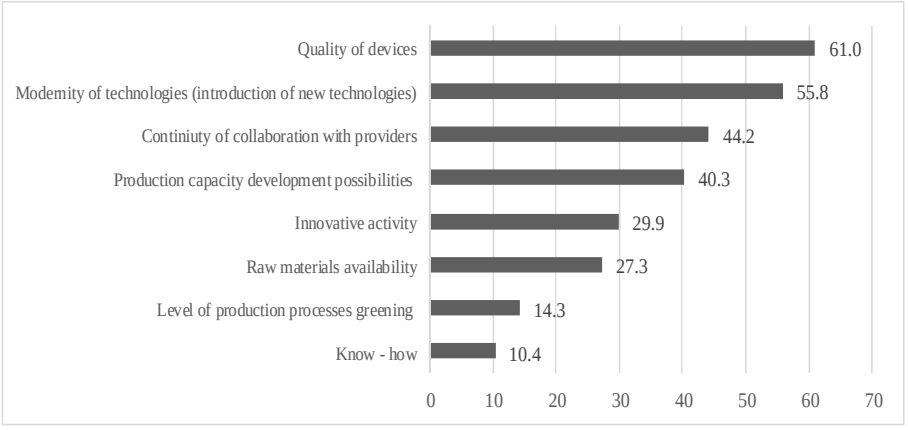

Figure 4. Production potential and physical resources influencing enterprise competitiveness (%)

Source: authors' own research.

The enterprises notice that the company's image (87%) and customer relations as well as service quality (84.4%) are the key factors of company's competitiveness in production and distribution sphere. It is worth to mention all the medium and large companies indicated that company's image, which was a base for building competitiveness for them. Small and micro firms more often indicate customer service quality.

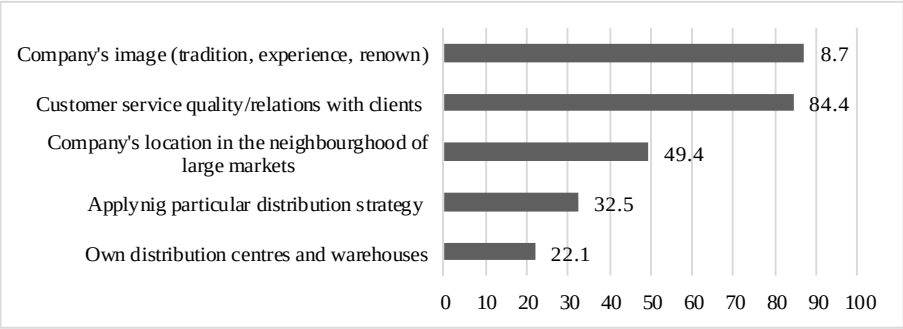

Figure 5. Enterprise competitiveness factors in the selling and distribution sphere (%)

Source: authors' own research.

The analysis of the respondents' answers allows to notice that in the product sphere, the enterprises pay attention to the quality and price. Respectively for 83.1% and 76.6% inquired, these are the main factors of product competitiveness. The product range is essential for the firm competitiveness as well and in case of large enterprises also their innovatory character. It is worth to highlight that for the enterprises, the width of the product range is important, but its depth and diversity of the product has less meaning.

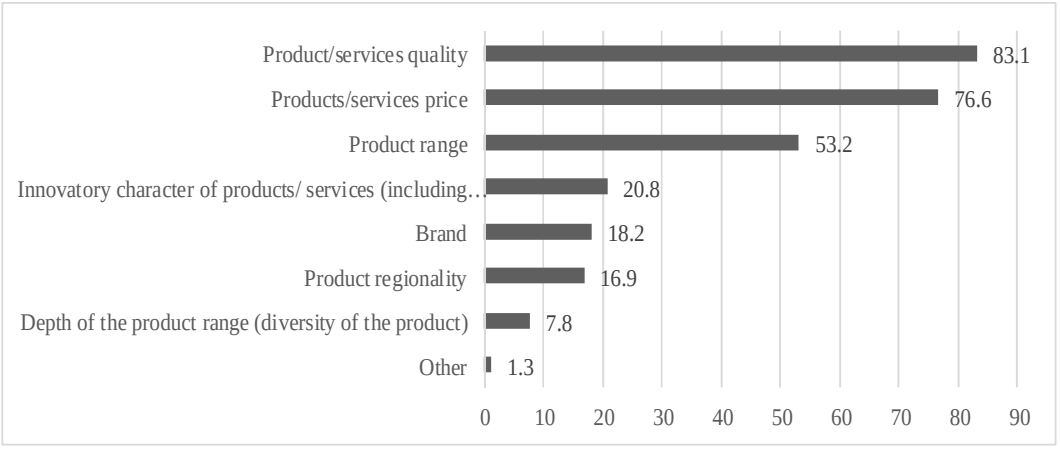

Figure 6. Sources of company's competitiveness in the product sphere (%)

Source: authors' own research.

The competitiveness of an enterprise is also influenced by quality of intellectual capital. In this area, the respondents pay attention to experience and knowledge of the owners (76.6%) and employees (70.1%) as well as their engagement (68.8%). It is worth to mention that "*Human capital*

may be used in a number of places simultaneously; it is not only subject to depreciation, but furthermore, it increases its value by acquiring new skills and experience, due to which it is one of the most important factors of creating competitive advantage on the market" [Smoluk-Sikorska, Jabłońska-Porzuczek, Kalinowski 2014, p. 260]. What is interesting, in micro- and small enterprises – experience of employers, in medium and large – employees are significant. In spite of high importance of experience and knowledge, large enterprises mainly indicate human resources management strategies and relations with employees as the key factors of their competitive advantage. It is worth to highlight that employers do not see the need for employees' participation in trainings and they are not interested in their creativity. What is important, the research proves that in large enterprises such creativity is even unwanted.

SUMMARY

The globalisation contributes to increased competition on both national markets and international ones. Therefore, enterprises, in order to gain better market position, have to adjust to the changing conditions, accurately evaluate situation and what follows that manage efficiently. Basing on the conducted results analysis concerning companies operating in confectionary and bakery industry, it was found that:

1. Enterprises occasionally carry out evaluation of their market position in relation to the competitors;
2. In business environment, fiscal policy of the state has the greatest influence on competitiveness;
3. Quality of devices is the crucial factor in the area of production potential,
4. Company's image and customer service quality are the most significant in the selling and distribution sphere;
5. Quality and price have the highest impact in the product sphere;
6. Enterprises pay attention to the significance of owners' intellectual capital and experience and employees' knowledge.

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Marek Tabert[20]

IDENTIFICATION AND ANALYSIS OF PRIMARY PROCESSES IN MANUFACTURING ENTERPRISES

Abstract: The aim of this study is to conduct a systemic analysis of primary processes observed in a manufacturing enterprise. The concepts of a simple and complex process were defined. Two process profiles in an enterprise were introduced in relation to the time axis: vertical and horizontal. As a result of the vertical profile three processes were distinguished and defined: premanufacturing, manufacturing and post-manufacturing. In turn, in the horizontal profile the management and executive processes were distinguished and characterised. Applied divisions constitute the basis for the classification of all the other processes, which depending on the needs are distinguished in a manufacturing enterprise. Results of the analysis may be used e.g. as the basis for identification of other processes when applying the reengineering method in restructuring of enterprises.

Key words: system, processes of an enterprise, reengineering method, premanufacturing, manufacturing and post-manufacturing processes, management and executive processes

INTRODUCTION

In the late 1990's customer pressure on manufacturers was growing to supply increasingly customised products. At the same time these products needed to be manufactured at costs comparable to those for lot production. Meeting such requirements when applying current management forms is difficult or even impossible. The situation has been aggravated by strong competition between enterprises within individual sectors. Both these factors resulted in search for novel solutions in management of enterprises, which could help solve the encountered problems. At that time the concept of reengineering (Business process reengineering – BPR) was developed. It was presented for the first time by M. Hammer in 1990 and immediately became a success. The book published on the subject [Hammer, Champy 1996] was sold in 2.5 million copies. The BPR method initiated the application of the process approach (process-oriented approach) to enterprise operations.

BPR is a method to design the technological and economic restructuring of enterprises. It consists in the introduction of radical innovative changes in business processes within an enterprise. These changes aim at reaching maximum efficiency of processes and reduction of manufacturing costs. The essence of the BPR approach is to focus on the identification and execution of processes in an enterprise and next to target these processes, which are connected with customers and external suppliers.

The aim of this study is to conduct a systemic analysis of primary processes found in manufacturing enterprises. In literature on the subject the concept of a process may be defined in various ways. For example, Hammer and Champy defined a process as "a set of actions requiring an input and producing an output being of some value for the customer" [Hammer, Champy 1996]. According to Durlik [1998], a process "is an ordered and interconnected set of manufacturing or service actions, performed within a specific time, as a result providing benefits to external and internal customers". The PN-ISO standards define a process as "a set of mutually interconnected resources and actions, which transform an input condition into an output condition" [Maleszka 2000]. A more complex explanation for a process is given by Grajewski [2007], according to which a process "is a set of sequential actions, bound by cause-and-effect dependencies in the sense that

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the outcomes of preceding actions are inputs in the successive actions. Each action or set of actions may be presented as a process, as a result of which from a certain initial value, i.e. an outlay, we obtain a result, i.e. an input transformed and enriched with an added value constituting the process outcome".

Such a wide variety of definition of a process makes it difficult to distinguish and analyse partial processes when applying the BPR method. For example, Szpaderski [2008] pointed to "the chaos in nomenclature in management sciences, which hinders cooperation between representatives of individual specialisations. A systemic terminology makes it possible to provide a consistent set of terms for the investigated organisational problem, thus facilitating communication and providing insight into the research problem". For this reason it was decided in this study to rationalise the problem of processes taking place in enterprises. Results of this analysis provide a convenient basis for the identification and classification of all the other processes found in manufacturing enterprises. The proposed solutions may prove useful when applying both BPR and other methods, e.g. Total Quality Management (TQM), Activity Based Management (ABM), Time Based Management (TBM), Activity Based Costing (ABC), Activity Based Budgeting (ABB), etc. In this study the starting point for the analysis of principal processes found in manufacturing enterprises was assumed to be a model of an enterprise as an open system.

MANUFACTURING ENTERPRISE AS A SYSTEM

Operations of a manufacturing enterprise may be presented as a system[21], which primary objective is to obtain financial surplus (profit). This surplus is a result of a positive difference between the revenue of an enterprise and costs of its operations. In turn, costs and revenue are consequences of manufacturing and sales of final products[22], occasionally in combination with provision of services related with those products. Figure 1 presents a structure for the system of operations of an industrial enterprise. Arrows indicate the direction of processes within the enterprise along the time axis. This figure includes also interactions between the environment and this system, which are represented by double arrow vectors. This shows that an enterprise is an open system, found in a relative (dynamic) equilibrium with the environment.

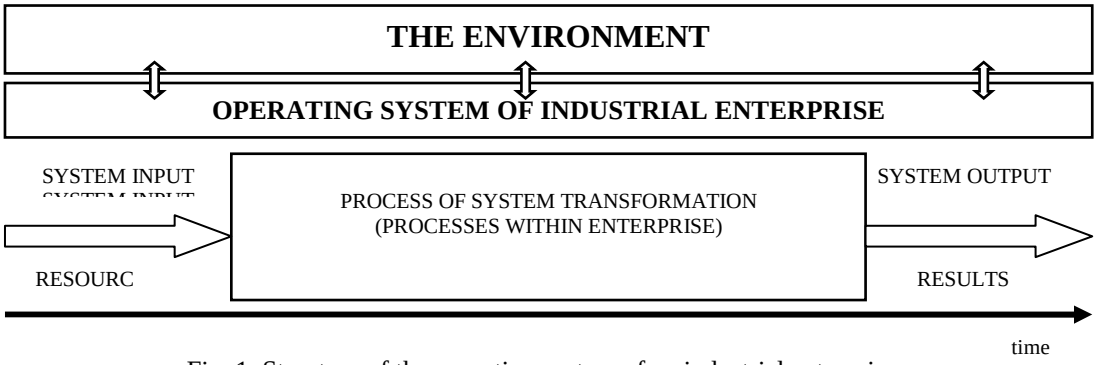

Fig. 1. Structure of the operating system of an industrial enterprise

Source: own study.

[21] System (Old Greek. *systema* – a complex entity) – a physical or abstract object, in which we may distinguish a set or sets of elements mutually connected into systems, performing as a whole a principal function. Internet: https://pl.wikipedia.org/wiki/System (available 21.09.2016).

[22] The term "product" (an object of work) in the general sense refers to any object of work, which may be referred to using specific names: input product – raw material, material; semi-finished product – an element, a detail, a part, a subassembly, an assembly; final product – finished product. In this paper the term "product" is applied in the general sense. However, in situations requiring a more specific definition the term "product" was replaced by specific terms.

The system is composed of three primary components: input, the process of transformation (processes within the enterprise) and output. The **system input** comprises the resources of the enterprise: material, financial, workforce and information. They are collected from the environment of the system in accordance with the requirements of the transformation process based on purchases, rent, leasing, loans, credits, etc. Resources supply the transformation process and are processed in its course.

During the **transformation process** financial resources at the disposal of the enterprise are transformed into the other three types of resources. These in turn are further processed (used) and they gradually take the form of final products and manufacturing waste. Manufactured final products are sold, thus being transformed into enterprise income. Waste also undegoes changes. They are disposed of or processed into useful products and sold, thus increasing the company's income. Costs growing during the processes within the enterprise reflect gradual consumption of resources, recorded in terms of their value. Performance of the transformation process in relation to the workforce resources results in the employees gaining greater experience and skills in the performance of work, while also enhancing their qualifications thanks to training and workshops. In turn, processing of information resources leads to the generation of various types of information sets. They are recorded on paper or electronic media. Produced sets of information are used to initiate and run all processes within the enterprise.

The **system output** is composed of the enterprise resources transformed by processes to the required, final form. They first of all take the form of revenue, which considerable part is allocated to cover costs. In this way resources are recreated. Moreover, revenue is used to pay taxes and liabilities in relation to various external organisations. The other part of revenue constitutes financial surplus. It is the final result of appropriate operations of an enterprise. Financial surplus may be transferred whole or in part to enterprise owners or allocated to increasing its financial resources. Final results of changes in the workforce resources refer to employees temporarily stopping work (e.g. holidays) or leaving the enterprise permanently (e.g. retirement or redundancy). The final results of information processing comprise compilations, prepared by the company employees in the form of documents, which are dedicated to external organisations.

RESOURCES OF ENTERPRISE

Resources of an enterprise include everything remaining at its disposal. We distinguish four basic types of resources: material, financial, workforce and information. Material resources are divided into means of production and objects of production. Means of production include machines and equipment, tools, various forms of energy, enterprise infrastructure (buildings, structures, traffic routes, etc.) and the enterprise space, in which machines and equipment as well as infrastructure are located. Final products are manufactured by enterprise employees from objects of production and means of production. Time is not classified as a resource, although it is used by enterprise processes. Time may not be bought or obtained.

Resources of an enterprise are sets of objects – elementary components of individual types of resources. Each object is characterised by its properties. A set of all properties of an object constitutes its state. Objects belonging to material resources take the form of material objects or energy. In turn, financial and information resources are found in the form of records on respective media. Objects belonging to these three types of resources are subjected to various types of actions and processes, which take place in time and in the enterprise space. The fourth type of resources comprises employees, who serve the subject function in relation to the other resources, determining their use in processes within the enterprise.

BASIC CHARACTERISTICS OF ENTERPRISE PROCESSES

Processes[23] **of an enterprise** are used to transform properties of resources found in the form of material objects or records of information. At the elementary complexity level processes performed in a manufacturing enterprise are composed of varying numbers of actions connected into series. Events are composed of actions. Thus in a broader sense processes within an enterprise may be presented as series of events. In such a case objects, in relation to which actions are performed are included. Figure 2 presents a model structure of a single event.

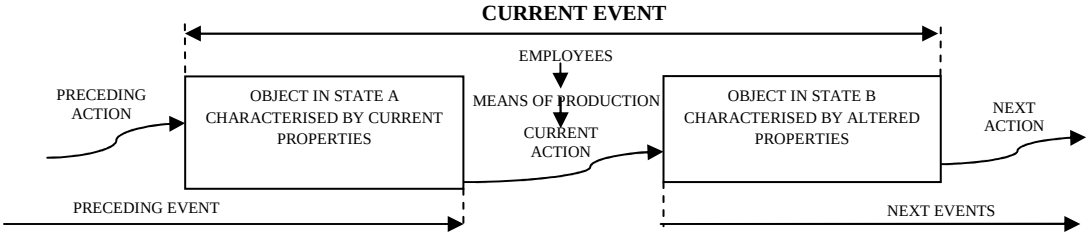

Fig. 2. Model of structure of a single event. Transformation of an object from state A to state B as a result of actions performed on this object

Source: own study.

A single **event** takes place as a result of performance of actions on an object, such as a material object or information recorded on paper or electronic media, causing a change in the object properties. As a result of performance of actions initial properties of an object (see Fig. 2 – objects in state A) are transformed into a new set of properties of the object (see Fig. 2 – objects in state B), in accordance with the objective of the process. Actions comprising an event are initiated and performed directly or indirectly by employees, who use means of production (tools and equipment) and energy to perform them.

In enterprise processes events are found in an ordered sequence resulting from the cause and effect relationships, which take place between them, in accordance with the processing rate of objects of production and information into final products. Events are interconnected, analogously as links in a chain. Elements linking successive events are objects belonging to neighbouring events, characterised by the same properties. Connected events form simple or complex series (Fig. 3), which are respectively referred to as simple or complex processes. Diagrams of these processes are presented in Figure 3a and 3b. In Figure 3b a series marked with a broken line indicates symbolically the next simple series of events, which may constitute a complex process.

In **simple processes** (Fig. 3a) events are performed in series in a pre-determined order. **Complex processes** (Fig. 3b) are composed of two or more simple series, performed simultaneously, which are joined starting from a specific event into one simple series, forming with other series a complex set of events.

[23] Process (Latin *processus* = progress, procedure) – an ordered series of successive actions, connected by cause and effect dependencies, i.e. results of preceding actions are inputs (initiate) successive actions. Kopaliński W.: Słownik wyrazów obcych i zwrotów obcojęzycznych. Wyd. De Agostini Polska, Sp. z o.o., Warszawa. Internet: http://www.slownik-online.pl/oslowniku.php (available 11.01.2016).

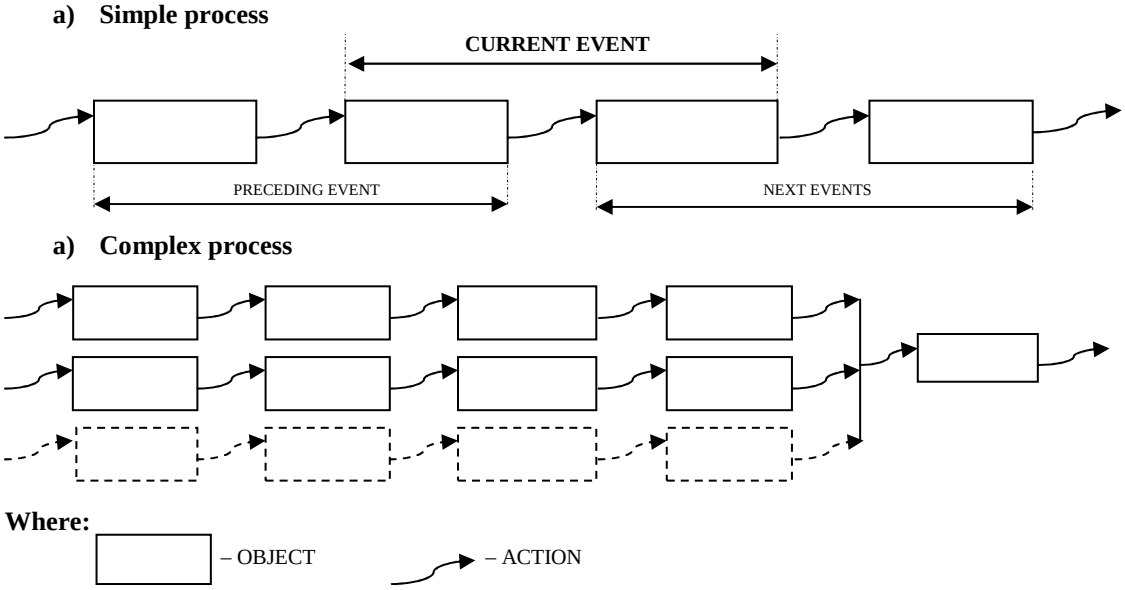

Fig. 3. A diagram of structure of a simple and a complex process including events

Source: own study.

In a narrower sense the processes within an enterprise are presented as a series of actions, instead of series of events. In such a case we disregard the object (an object of production or a record of information), in relation to which these actions are performed. It is an admissible approach, if such a simplification is sufficient for an appropriate characteristic of processes within an enterprise. That is e.g. the case at the construction of a diagram of a complex technological process composed of operations, when the object of production does not have to be considered.

VERTICAL DIVISION OF TRANSFORMATION PROCESS

In the system transformation process we may distinguish two basic groups of enterprise processes. They are manifested as a result of both vertical (Fig. 4) or horizontal section (Fig. 5), respectively, conducted for the transformation process in relation to the time axis. The first group is composed of premanufacturing, manufacturing and post-manufacturing processes [Liwowski, Kozłowski 2007]. In turn, the other group comprises management and executive processes.

Processes within an enterprise identified based on the vertical division are at the same time stages in the performance of the transformation process. At each stage only one of the three types of processes is performed, i.e. premanufacturing, manufacturing or post-manufacturing. Processes take place in succession (see Fig. 4), due to the passage of time and cause and effect relationships, occurring between them. The scope of realisation of the transformation process on an object of production was applied as a criterion for the identification of these processes.

All actions, which may be performed before the initiation of the manufacturing process are included in the premanufacturing process, while all the actions, which need to be performed after the completion of the manufacturing process constitute the post-manufacturing process. Actions, which may not be performed in the premanufacturing or post-manufacturing processes constitute the manufacturing process.

The **premanufacturing process** (preparatory process) is a series of events, which prepare the enterprise for the performance of the next two processes (manufacturing and post-manufacturing).

The premanufacturing process is performed first of all in such departments of the enterprise as: R&D, design, technological and organisational production process engineering. This process generates manufacturing documentation. It comprises design documentation of products, which are to be manufactured, documentation of manufacturing processes for these products as well as manufacturing plans and schedules. Plans and schedules indicate resources, which are to be used in the performance of manufacturing and post-manufacturing processes. They also specify dates, on which these processes are to take place. Moreover, the premanufacturing process includes events, which objective is to supplement resources (purchases and supplies) and to gain buyers for products manufactured in the enterprise (advertising, acceptance of orders). Actions, which object is information, predominate in the premanufacturing process. They consist first of all in its collection, processing and publication.

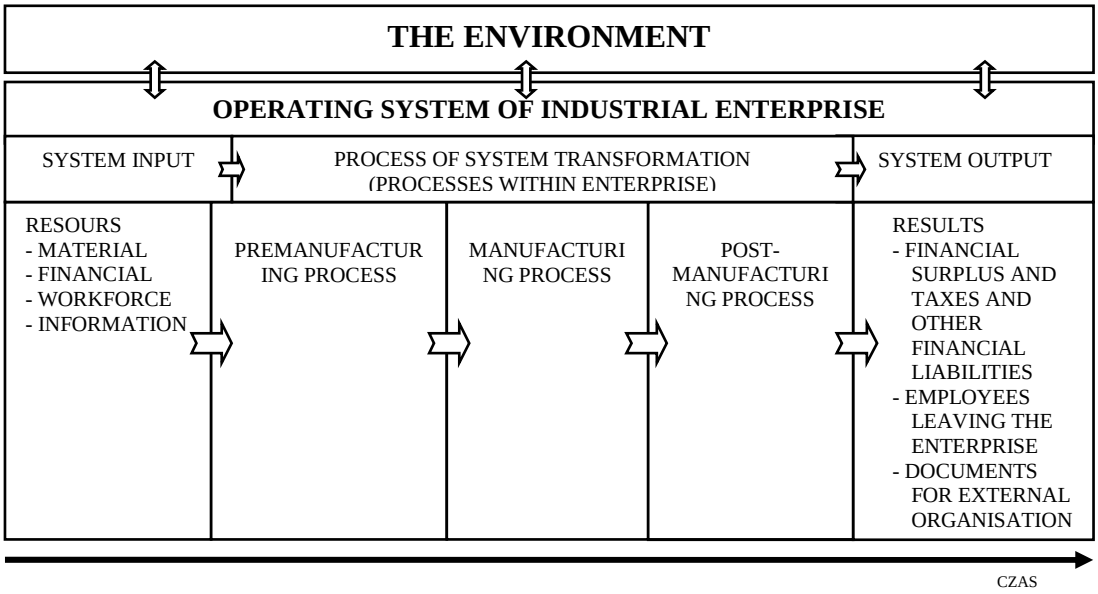

Fig. 4. Structure of the operating system of a manufacturing enterprise with the vertical division of the transformation process

Source: own study.

The manufacturing process (production process, production24) is a series of ordered events together with accompanying phenomena, such as natural processes and operation intervals, as a result of which properties of input products are increasingly transformed into planned utility properties of output products (final products) [Tabert, Lis 2014]. The manufacturing process includes also auxiliary actions (e.g. generation of energy, tooling, etc.) and service (e.g. administration, organisational, protection actions, etc.). They facilitate and support the appropriate course of the manufacturing process until the final products are obtained [Brzeziński 2013].

In the course of the manufacturing process input products (raw materials, materials, parts and accessories) are successively collected from input warehouses of the enterprise or directly from

[24] Production (Latin *productio* = release) – transformation of resources into goods and the result of this process. Internet: http://encyklopedia.pwn.pl/szukaj/produkcja.html (available 11.01.2016).

suppliers. Next technological or auxiliary actions are performed on them. Output products manufactured as a result of these actions are transferred cyclically to warehouses of final products or directly to customers. The manufacturing process is the basic part of the operations of a manufacturing enterprise. It comprises actions, performed on matter – being the essence of the manufacturing process and actions, in which information is their object.

The term "manufacturing process" is used in a static or dynamic sense. In the former case the manufacturing process is expressed in the form of a static structure. It illustrates the distribution and organisation of means of production and the allocation of manufacturing tasks and employees. To indicate that a situation is presented in a dynamic sense we apply the term of course (flow) of the manufacturing process. The course of the process is then represented by a dynamic structure, which shows the supply of the process with resources (e.g. energy, means of production and information), as well as dependencies between actions, which are performed in the course of the manufacturing process [Pasternak 2005].

In manufacturing enterprises the course of the manufacturing process for products of the same type is a repeatable phenomenon – it is cyclical25. For the course of a single process repeated many times it takes the form referred to as the manufacturing cycle (production cycle) [Muhlemann 2001, Gryffin 2013].

The post-manufacturing process is a series of events concerning first of all final products after actions belonging to the manufacturing process have been completed on it. The objects of actions in the post-manufacturing process include both material objects and information. They are actions, which comprise sales and distribution26, as a result of which final products are delivered to customers. Moreover, this process also includes procedures connected with returning orders, performance of warranty and post-warranty servicing (post-sale customer services) and reclamation or disposal of waste from manufacturing processes. In enterprises procedures for manufacturing waste are gaining in importance due to the legal regulations introduced by the EU and incorporated to the legal order of Poland (see the Act on wastes27).

According to the definition given in the Act on waste (Art. 3) – "waste is every substance or object, which owner disposes of, intends to dispose of, or to which disposal the owner is obliged". Objects and substances considered to be waste are supervised, aiming at the protection of human health and the environment.

If residue from manufacturing processes is classified as waste, the enterprise is obliged to dispose of them following the principles specified in the Act on waste. In such a situation the enterprise has to process waste (using their own facilities or external companies) through waste recovery (utilisation28) or disposal. Manufacturing waste, which is not processed, needs to be removed from the enterprise premises and deposited in special waste disposal sites or incinerated in

[25] **Cycle – (Greek *kýklos* = circle) – actions, processes or phenomena, periodically repeated and occurring within a certain time period and constituting a closed development whole; also sets of phenomena, actions found within a specific relationship with one another and constituting a single whole. Based on: Onet wiem: portalwiedzy.onet.pl/polszczyzna.html?qs=cykl&tr=pol-all&ch=1&x=0&y=0 (available 10.09.2015).**

[26] Distribution (Latin *distributio* = division from *distribuere* 'to divide; to give away') – covers all actions connected with overcoming spatial, temporal, quantitative and assortment differences between the sphere of production and the sphere of consumption. Based on: https://pl.wikipedia.org/wiki/Dystrybucja_(marketing) (available 19.06.2016).

[27] Dz.U. 2013 poz. 21. http://isap.sejm.gov.pl/DetailsServlet?id=WDU20130000021 (available 19.06.2016).

[28] Utilisation (from French *utilisation* = use) – use of waste materials or those which lost their utility value. Internet: http://sjp.pwn.pl/szukaj/utylizacja.html (available 12.03.2016).

waste incinerating plants. Waste recovery29 is the preferred option, consisting in the use of waste as a whole or in part, leading to the recovery of substances, materials (recycled materials) or energy and their consumption.

The post-manufacturing process concludes the transformation of enterprise resources. Results of this process constitute the output of the operating system of manufacturing enterprises (see Fig. 4). In the post-manufacturing process manufactured final products are sold and distributed to customers. As a result the enterprise generates revenue. In the case when it is greater than the operating costs of the company, financial surplus is generated. If an enterprise does not generate financial surplus, it does not achieve the goal, for which it was established. A lack of financial surplus over a longer period results in liquidation of the enterprise as an economic entity in its previous form.

HORIZONTAL DIVISION OF THE TRANSFORMATION PROCESS

The transformation process (processes within the enterprise) may also be divided horizontally in relation to the time axis. The criterion adopted for such a division is connected with the types of resources included in the identified processes. Thus we distinguish two types of processes: management and executive. The management process is performed mainly in relation to information resources. In turn, primarily objects of production are the objects of the executive process. Figure 5 presents the operating system of a manufacturing enterprise with the horizontal division of the transformation process.

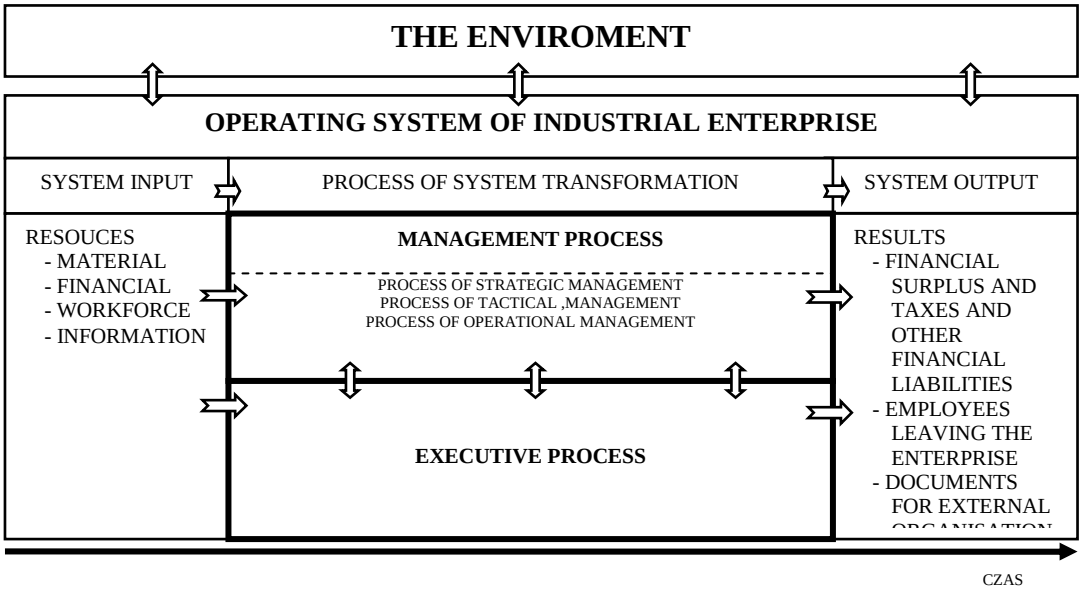

Fig. 5. Structure of the operating system of a manufacturing enterprise with a horizontal division of the transformation process

Source: own study.

[29] Waste recovery includes recycling. Recycling means recovery, within which waste is again processed into products, materials or substances used for their primary or other purposes, it does not include recovery of energy re-processing to materials, which are to be used as fuels or purposes of filling mining workings (Art. 3.1.23 of the Act on waste).

The **management process** consists in the determination, in the form of decision, of methods to use owned resources so that the objectives adopted for the enterprise may be achieved [see Lichtarski 2006]. Actions included in the management process (management activities) are performed in three levels of the hierarchical organisational structure of the enterprise: strategic, tactical and operational. Thus the level of the organisational structure, on which the management process is performed, is divided into processes of management: strategic, tactical and operational. The final results of the management processes include operating decisions, which initiate executive processes in the enterprise. A single decision means the selection of one mode of action out of two possible, based on the adopted criterion. Decision making is preceded by the performance of preparatory actions, which support the selection. Decisions are made by employees serving managerial functions in the enterprise and transferred to be followed to executive employees. The management process coordinates all actions of the executive process and controls them.

At the highest level of the organisational structure of the enterprise the **process of strategic management** is performed. It produces strategic decisions. They concern the entire enterprise and all its processes. As a result of the exchange of information the strategic management process connects the enterprise with the environment. The **process of tactical management** takes place on the second level. As its result tactical decisions are made. They are specific elaborations of the strategic decisions and concern some parts of the organisational structure of the company (e.g. manufacturing departments or sections) and affect individual types of processes within the enterprise. At the lowest level the **process of operational management** is performed. It results in operational (executive) decisions, being specific elaborations of tactical decisions. Operational decisions directly initiate actions of the executive process.

The management process may additionally be divided vertically into four stages in relation to the time axis. At each stage one process type is performed: planning, organisation, supervision or control. Within each type of the management process (strategical, tactical and operational) processes of planning, organisation, supervision and control are performed in succession. They are also referred to as **management functions**.

The **planning process** consists in the specification of the objective (the future state), identification, in the form of actions and processes, of stages to achieve this objective, determination of the performance times and dates for individual stages and allocation of required resources, including employees. Results of these actions produce tasks to be performed. The **organisation process** is the delegation of responsibilities and authorisations for the performance of tasks to manufacturing and administrative units, as well as determination of cooperation relationships between them for the appropriate performance of tasks identified in the planning process. In this way the organisational structure of the enterprise is constructed and service relationships are established between components of this structure. The organisation process also coordinates the flow of tasks between organisational units of the enterprise. Moreover, this process includes the accumulation and supply of resources to appropriate locations and at appropriate times. The **supervision process** (in a narrower sense[30]) consists in the issue of orders to subordinates delegating tasks to be performed and in motivating performers to realise given tasks in possibly the best manner, following the intention of the supervisor. The **control process** covers a comparison of planned and achieved results, determination of the difference (deviation) between them and based on the extent of the deviation determination whether tasks were performed properly. In the case of an inadequate performance the method of correcting inappropriate results is defined so that the planned and performed tasks are consistent.

[30] Supervision in a narrower sense refer to people. In turn, supervision in a broader sense covers all resources of the enterprise. Then it is identified as management.

The executive process is composed of actions performed on information or on objects of production in order to change their properties. It is performed based on decisions, which were made within the management process (see Fig. 5) at its various stages. The executive process results in transformation of resources of the enterprise into final products and next in the financial surplus. In the course of performance of the executive process information illustrating the status of the process at its successive phases and transferred to the control in the management process. Such a situation in Figure 5 is indicated by arrows directed towards the management process.

CONCLUSIONS

Using the vertical section premanufacturing, manufacturing and post-manufacturing processes may be divided into more specific processes. A vertical division reflects stages of the transformation process. Such a division produces types of processes, for which hierarchical units are identified: administrative (e.g. the trade department), administrative and manufacturing (e.g. the preliminary assembly department) and manufacturing (e.g. the lacquering line). In this way the traditional organisational structure of a manufacturing enterprise is constructed.

Also based on the horizontal division we may divide management and executive processes into mode specific types of processes. The horizontal division of these processes is the foundation for BPR, i.e. the process-oriented approach. Processes identified using BPR run across the stages of the transformation process. They combine actions of premanufacturing, manufacturing and post-manufacturing processes into one series, but at an individual level of specificity. Most frequently the level of specificity of the horizontal division is determined by the order for the final product, placed by a single customer. Such a process for a specific order runs from product design and collection of resources required for the performance of a task until the acceptance of the final product by the customer. The process approach is specifically adapted to two production organisation systems: production of products engineered to order (Engineering to Order – ETO) and production to order based on the offer for final products (Make to Order – MTO).

It is also applied in relation to the transformation process both in the vertical and horizontal section. Such an approach makes it possible to distinguish partial types of processes, adequately adapted to analytical needs. The simultaneous vertical and horizontal divisions facilitate a definite establishment of boundaries between individual processes and indication of their interdependencies. It is also a good foundation for the presentation of all processes presented within a cohesive classification system, which may take place in a manufacturing enterprise.

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Krzysztof Wołodkiewicz[31]

A STUDENT GROUP IN THE LIGHT OF KNOWLEDGE CONCERNING SMALL SOCIAL GROUPS

Abstract: The subject of this elaboration is a student group. This environment and various interactive processes occurring in it allowed us to assume the point of view defining a student group as a small social group. The author of the article presented the role of groups in the development of individuals and their influence on the process of acquiring knowledge and skills. He characterised key features of social groups and presented the contemporary interpretation of the concepts of a 'group' and 'small group'. The article also presents the educational consequences of teachers' inclusion of elements of group dynamics in the process of education.

Key words: social group, small group, students, interactions, communication networks, group dynamics

INTRODUCTION

The manner in which students and teachers function during classes implicates their consideration as a group, which is characterised by interrelations targeted to achieve strictly defined goals. The character of the relation between the teacher and student mostly depends on the teacher. Interpersonal relations during classes show the character of relations between participants of the teaching and learning process and they express the profile of interaction between all subjects of this process.

Since childhood each individual has been involved in a group, starting with a family, then – a group in a nursery school, primary school, etc. In view of this fact, teachers' cognitive activity should be oriented towards understanding the dynamics of functioning of small groups, not only due to the assumption that teaching and nurturing processes chiefly involve interactions between the teacher and students who are understood as individuals, but also due to the manner in which participants function in a group and its influence on the individuals of whom the group is composed [Mika 1987]. The teacher who can take care of a class as a group will not only increase the effectiveness of teaching individual subjects, but they will also multiply opportunities to achieve mutual socioemotional adaptation [Skinner 1970]. W. Doise, G. Mugny and A.N. Perrot-Clermont prove the thesis that student-student interactions are also significant to students' cognitive functioning. For example, when a person who is less developed is working on a problem together with a more developed person, it accelerates the occurrence of logical operations in a child with delayed development [Mika 1981]. Students' collaboration in classes, especially in small groups, may be beneficial to the development of each individual.

THE CONCEPT OF A GROUP AND ITS DYNAMICS

Group dynamics is analysed by representatives of numerous disciplines, such as psychology, sociology and pedagogy. Groups are characterised by elements such as: size, roles, status, interpersonal relations, integrity, interactions, tasks, periodical changes and standards. Among high diversity in typology of groups this article focuses on small groups of university students. In order to use the term 'small social group' it is necessary to specify its size. There is divergence whether two or three people can be regarded as a small group and researchers differ in their opinions. Carol K. Oyster [2002] thinks that it is more important whether two or three people can regard themselves as a group rather than how many people there should be in a group. The author expresses her opinion that as few as two people can make a group, because the course of processes occurring in

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groups of two people is similar to processes in groups with more members. The authors of *Communicating in Groups* understand the term 'small group' as a group whose members notice each other and are aware of each other in terms of individuals involved in interactions [Adams, Galanes 2008]. According to W. Domachowski [1998], we can speak of small social groups when their size ranges between 2-3 and 25-30 people. J. Szczepański [1970] thinks that a social group is composed of at least three people who are separated from others by clear principle of distinctiveness. It is important for members of a particular group to be aware of their distinctiveness and other people should also see the distinctiveness of this group. The awareness of group distinctiveness is also emphasised by F. Znaniecki, whereas M. and C. Sheriff stress that the group should have a distinctive system of values [Sowińska 1974]. There are two approaches to the definition of a small group [Domachowski 1998]:

1. concentration on one factor, which is a sine qua non for the group functioning,
2. several factors are distinguished and only their simultaneous occurrence gives grounds to call a given community a small social group.

The first case is characteristic of M. E. Shaw's approach to a small group, who uses the following distinction criteria:

- perception – we can speak of a group when its members see themselves as participants,
- distance between group participants or joint activity,
- motivation – supporters of this criterion see a group as a community whose members have the same motivation to be in the company of one another,
- goals – goals of a group result from being together with other people and from joint activity when individual activity is ineffective,
- organisation – this factor might be a derivative of the common goal; the concept of a group refers to a community with its own structure, i.e. there are positions individual members of the group can occupy in its structure and there are relations between them,
- interdependence – members of the group must be aware of the fact that they are equally affected by consequences of their activity or things happening around them, threats, possibilities, etc.,
- interaction – refers to the group participants' activity where the behaviours of some participants are reflected by actions taken by other members. From this point of view we can say that interaction is a form of interdependence.

A STUDENT GROUP AS A SMALL SOCIAL GROUP

'Encyklopedia pedagogiczna XXI wieku' ('The 21st Century Encyclopaedia of Pedagogy') provides the following definition of a small group: small groups are characterised by the possibility to maintain mutual direct contacts between their members and there are strong interpersonal bonds between them [Pilch 2003]. In a student group, which is a social group, all interactions mostly have the nature of direct relations, which means that there is face-to-face communication between people and there are no intermediaries providing information. Also S. Mika [1987] emphasises the fact that in small groups interactions between their members are characterised by relations between one another and, apart from that, by direct interaction. E. Gaweł-Luty [2004] defines the concept of a group in the following statement. Two or more people make a group if they fulfil at least the following four conditions:

- there must be direct interaction between these people,
- they must have a common goal,
- there must be standards in the community of individuals forming a group,
- there must be a structure in this community.

When we analyse S. Mika's words [1987], we can conclude that a student group is small, because when we consider it from the point of view of direct relations, we can notice common space

and the fact that the number of people in the group who spend a few hours a day together causes almost every student to enter into direct relations with other students. This regularity concerns both teachers and students. According to W.F. Bruce [1970], schools should be organised into groups because it gives a possibility to fully satisfy individual needs. Definitions of a small group are also provided by S.P. Morreale, B.H. Spitzberg and J.K. Barge [2003]. The authors applied four main criteria to define this term:

- a group must consist of at least three people,
- each member must see themselves as a participant in the group,
- the behaviours and goals of each member of the group must be interdependent and the group must depend on its larger context,
- there must be communication between members of the group.

In the light of the information given above we can assume that a small group consists of at least two people who notice each other, are interdependent and communicate with each other.

Teacher's understanding how a group functions is a condition for appropriate relations between students in a group. The teacher should be aware that a student group is a formally organised social group consisting of people of similar intelligence and physical development, who manifest similar needs and interests [Łobocki 1985]. A student group is an area where basic socialising processes occur, which are underlain by the following regularities [Sowińska 1974]:

- a human participates in the life of a student group during the period of their life when they are susceptible to the influence of surroundings,
- contacts between an individual and a student group last a few years; during this period the influence of the group becomes consolidated,
- an individual participates in a student group with their entire personality, thus satisfying not only their cognitive needs but also social ones as well as the needs for contact with peers, their acceptance, appreciation, etc.
- a student group is influenced by the teacher, who develops its structure, corrects a wide range of phenomena and events occurring in the group.

COMMUNICATION IN A STUDENT GROUP

For many people the period of studies at university is the time of the most significant experiences. The character of young students' experiences is largely determined by the type of relations in the group and by communication between the teacher and students. Group members form communication networks, i.e. structures in which communication takes place between them and there are channels through which information is transferred from the sender to the receiver [Jurkowski 2004]. These are recurring pathways of channelling information between participants of the communication process [Oyster 2002]. Group members can make networks of direct or indirect forms of communication, formal and informal communication networks, where messages can flow through different channels – verbal and non-verbal ones. It takes a long time to form a communication network, which later undergoes transformation. Frequently used connections become stronger, whereas unused connections tend to expire. A formal network presents a desirable scheme of communication in a group. An informal network shows the actual status quo. For example, it presents the exchange of information between students. Simultaneous exchange of information in both networks may cause interference and reduce the efficiency of communication. The centrality category is chiefly used to describe communication networks. A large number of channels through which information is transferred reduces the efficiency of group communication. The more centralised a network is, the greater the communicative productivity of the group is and the more satisfied its members are. Centralised networks result in solving simple problems more effectively, whereas decentralised networks favour complex

problems through the free flow of information. Communication in a student group takes place both in centralised networks with one-way flow of information and in decentralised networks comprising a wide range of channels enabling each group member to communicate [Oyster 2002, Jurkowski 2004].

SUMMARY

For many years the problem of the functioning of social groups has occupied an important position among pedagogues' interests, especially in the context of education. Efficiency of education is a complex result of the effect of many cognitive, motivational, emotional and social factors, including the mechanism of functioning of a group whose members are university students. The knowledge about the functioning of social groups is as important as the knowledge of the subject taught by the teacher or the knowledge of methods of intellectual work. The phenomena occurring in a student group, i.e. its integrity, methods of transferring information, mutual adaptation, collaboration of learners, relations between students and relations between students and the teacher, existing communication networks, are of key significance in the process of acquiring knowledge and skills by students. Therefore, we should expect each teacher to have knowledge about the functioning of small social groups, such as a student group, to strengthen the learning process and multiply the results of participants' joint effort in the process of education.

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THE ROLE OF ENVIRONMENT AND RESTRUCTURING POLICY FOR LOCAL LABOUR MARKETS - ANALYSIS BASED ON POLISH PERIPHERAL AREAS

Abstract: The task undertaken in this study is characteristics of selected phenomena and processes which are determinants of the local labour market and result from persistent features of local system and systemic change. The aim of paper is to clarify the causal relationship between its environment and restructuring policy and current status of the local labour market and provide a guideline for intervention. Analysis had been included in two categories of circumstances relating to the development of the labour market in the local area which are: local labour market linkages with the environment and process of restructuring the local economy, which has brought changes in the rules for the functioning of the labour market in the local area. This two selected and considered factors constitute a framework of current determinants of local labor market status, but of course they are not only one.

System analysis approach was applied in this paper according to the principles of system dynamics created by J. Forerster. In the simulation author intend to show how the labour market without reserves and with the low level of settlement operates. Analyses presented here refer to poviats in Poland situated outside the agglomerations owing specific opportunities, threats, chances and barriers which are far different from labour markets of big cities and suburban areas.

Key words: local labour market, privatization, self-government, economic behaviour, system dynamics

INTRODUCTION

Space[34], which is nearest to the social and economic activities in the local labour market is microspace of the economy. Characteristic are the features such as: location, population, natural environment elements, the status of the socio-economic development, a small scale of internal distance, and in regard to neighbouring local units. Its elements are: territorial social system, and local economy, so every resident and business is involved in the local economy performance. The part of this system is a local labour market [Kowalski, Letza, Wihlborg, 2010, 155-202].

The main reason for the implementation of research relating to the local level are derived from several sources. They are:

1. At the local level the resource of labour force is settled and here arise the basic layout of employment factors, decisive for the formation of a new work place, the acceptance of work by job seekers, and formation of employment and social attitudes to work in the local population.
2. The confrontation of labour supply and demand, is made mainly in the poviat areas, according to the territorial division in Poland.
3. Relationships that occur on local labour markets and processes play the main role in the process of employment.

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[34] A paper was prepared on the basis study conclusions on remote areas in Poland in the years 2008-2012 [Ziomek, 2013].

The above mentioned criteria are responsible for the status of the labour market and for the economic and social factors of employment creation.

The task undertaken in this study is characteristics of selected phenomena and processes which determine the local labour market and result from persistent features of local system and systemic change. The aim is to clarify the causal relationship between the selected phenomena that affect today's status of the local labour market of peripheral area and can be a guideline for intervention.

Considerations are based on two selected categories representing factors of labour market performance in the local area development. They are:

I. environment of local market, and related to this permanent imbalance of local markets development,
II. the process of restructuring local economy, which brought changes in the rules of the labour market performance since 1990.

Below listed features are characterized, but at beginning, it is worth mention that the description of these conditions requires a broader, more than poviat level scale attention, in particular with regard to the economic conditions and infrastructure. This comes directly from the accepted definition of the local economy, which is having the borders limiting the scope of its administrative activities and production processes and cooperation takes place in a wider space, often exceeding these boundaries [Ziomek, 2013, p. 133-146]. Conducted analysis covers essentially the scope of poviats in Poland, that are settled outside agglomerations and come from Polish regions[35]. The remoteness of these areas from the urban spatial layouts, creates loss of the benefits which directly result mainly from settlement density, an accumulation of infrastructure and entrepreneurship. In this context conditions of the local labour market development are usually problematic and difficult to overcome, what become a reason to analyze and identify sources for these difficulties.

THE CHARACTERISTICS OF ENVIRONMENT INFLUENCE ON THE LOCAL MARKET

The local economy has a typical layout of the structure of the local labour market. This structure is composed of one central area, most often it is a city or industrial center, along with the adjacent surrounding area, carrying out functions of service in regard to center. On the structure of the local labour market, we can also look at different way, namely as the local labour market that integrates gmina job markets around the poviat city and its surroundings is the functional space of the gmina units. This a layout of spatial structure suggests another feature, the local labour market is strongly involved in the relationship with the environment of varying scale and represents the subsystem of a larger system. This means that, this market does not close in the territorial borders, it is open to resource flows[36]. It is characterized by low degree of flows balance. This means that when we take into account the size and structure of resources, the case rather than the rule is full balance of the worker demand in the local population to work and the local demand for labour force.

[35] Selected poviats refer to the group identified by author as a result of analysis undertaken in broader study published in Socio-economic determinant in local approach (pl.), Poznan University of Economics, Poznan 2013.

[36] On the local level we find the phenomenon of non-balancing flows, because existing resources balance system in the whole national economy or even in a wider scale. The local unit is developing as a subsystem of a higher order, and thus obtain from the environment resources and use them, or converts and transfers to other areas, as well as through the use of own resources provides its products and services on own area and exports it to the outside world. The local system is therefore a set of non-closed shut, i.e. its boundaries do not constitute a barriers to interregional linkages, including the flow of labour, and financial capital, goods and services.

Balancing may or may not be achieved even as a result of movements of labour resource between local territorial districts.

From the characteristics which is the lack of a balancing flows in the labour market results another his feature. Namely, when there is a small stocks of workforce, in a certain situations that require obtaining a large number of workers this market turns out to be a stoichiometry, i.e. without equivalent reserves of labor force.

The dynamic of system in the process of employment on the labour market without reserves, with the recognition of the availability of workers can be represented using the structure of the principles of the system dynamics (see: Figure 1.) For simulation of dynamic changes, author adopted indicators as:

- degree of regulation, indicating regulation level of the local labour market, as equal to 0.001 point, what means –very weak,
- the availability of workforce, which by convention shows the freedom of access to the labour force in a given period in poviat, it is equal to 3,600 points – very difficult.

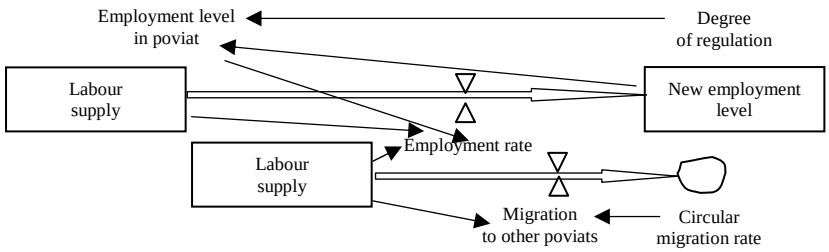

Figure 1. Structure of changes in the process of employment on the labour market without reserves according to the principles of System Dynamics.

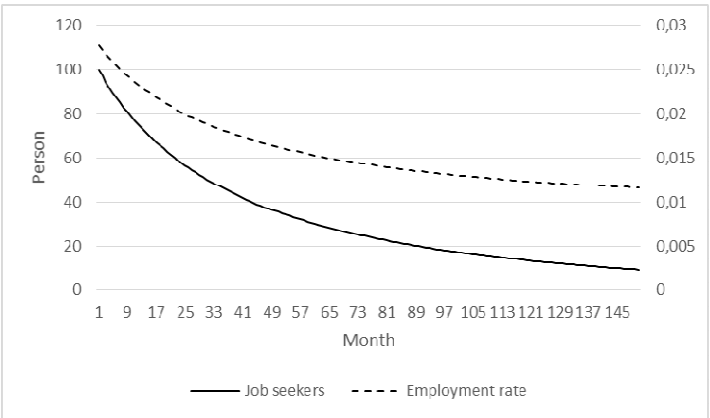

Figure 2. Job seekers (left axis), Employment rate (right axis), variables associated to Fig 1

Source: Data processing own.

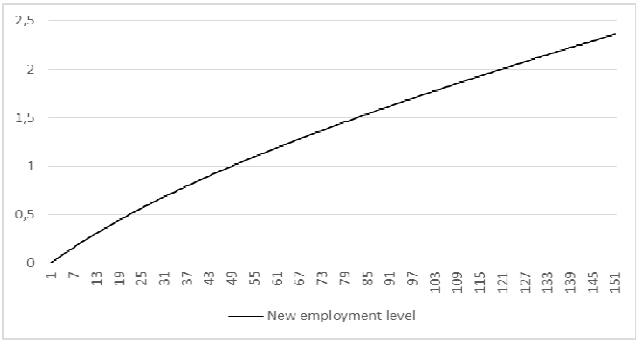

Figure 3. New employment level, variable associated to Fig 1

Source: Data processing own.

Quantitative changes of the system shows that small degree of regulation on the labour market, represented by a variable of employment rules, and the availability ratio of the labour force allow to increase the number of new workers. But after a stage of growth system stabilizes. Reaching the stage of stabilization of changes system simulation shows that without the influence of workers from outside the poviat, and labour flow as a result of labour migration on the outside, it will fail to achieve quantitative growth of employment (Fig. 2, Fig 3).

Changes in the labour market in poviat dependent on factors shown in the diagram above as far as simplified, focusing only on the quantitative relationships between the number of job seekers, and the number of the newly employed, with the rate of employment explained by relation: (the number of job seekers - employment level in poviat)/availability ratio of the labour force. Therefore, the above scheme should be regarded as an illustration of the changes reflecting the labour market without the reserves only in the process of employment growth.

In conjunction with the relatively small scale of the labour market there is another feature that is the specificity of the sensitivity of the local labour market to changes in the economic cycle. In negative phases of the evolution of economic activity can occur acutely high decline in employment and labour emigration wave. On the other hand, during the favourable times poviat is dealing with a slow increase in employment or stepping change when will occur a strong increase in the number of jobs called by the new company location for large scale [Chądzyński, Nowakowska, Przygodzki 2007, p. 128-141; Specjalne strefy ekonomiczne 2012, p. 11.12]. Greater employment dynamics is created by a small scale of the labour market, which brings necessity for greater precision in the development of labour skills, and obtaining workers from neighbouring labour markets.

As we can notice, the environment stimulate process of balancing market in a local space. Imbalance in local labour markets development is a permanent phenomenon in the economy. Spatial differentiation arises and is fixed in economy system, especially in a free market economy regime. In a broader sense, it is based on contradictions between economic efficiency and the sustainability of development in space. It consists in the fact that the structure of the local development factors, including employment is characteristic for a given spatial units and develops according to their own trajectories, based on evolutionary and causal changes [Gawlikowska-Hueckel, Szlachta, 2016, p. 23-46]. In addition, the factors does not generate growth effects in a standardized way at any point in space, because they differ in characteristics of the conditions of their operation. Yes, each territorial unit is equipped with the same structure of the administrative authority, also has the same structure of higher education. However, a strong differentiating factor remain: demographic structure, vocational teaching program, commercial and cooperative relations in business, road

infrastructure and social facilities and conditions in the labour market [Jałowiecki, Szczepański, Gorzelak 2007, p. 154-172, 94]. The characteristics of spatial imbalance shape basement for differentiating employment levels and the degree of "labour absorption" in territorial space [The Global Competitiveness Report 2015–2016, 21.10.2016].

RESTRUCTURING AND ITS ROLE IN THE LOCAL LABOUR MARKET

The restructuring has led to positive and negative effects on the local labour market and they was formed as a natural consequence of the implementation of transformational changes, but also accelerated along with the influence of foreign direct investment. In the economy of the local districts remoted from major cities revealed a phenomenon associated with globalisation and the third revolution in science and technology [Górkiewicz, Siemiątkowski 2007, p. 383-384], which are:

- the fall of ford's production system and the emergence of the organization changes, resulting in a new techno-economic paradigm namely as a postford's, or post-industrial system. The result of changes was the strong use of information and knowledge for making improvements or product and process innovations, as well as the adoption of new technology and organization of production, and flexible forms of work and employment,
- the advent economic activities of globalization, as a result of which, the so-called relativism of the spatial dimension of the business occurs. In this connection, the importance of the domestic scale of loses decreases, and no other is growing, because the functioning of the enterprises is based on the aspect of space not a place,
- decrease of the heavy industry importance, characteristic for the era of mass production scale – "Fordist core", nonflexible and high-tech industry growth, based on flexible production structure, short series production, a large number of changing orders, developing and expanding production offer.
- strong development of the services sector, named as the servicing industry, i.e. softening it by industries associated with the provision of services and information. The same relatively diminishing role of craft industries, and increases the role of services in the production chain [Raport o rozwoju społeczno-gospodarczym, regionalnym i przestrzennym 2016, p. 12-14]. The expression of these trends is exclusion of certain activities from the production process in the enterprise and the emergence of outsourcing.
- socio-demographic changes associated with changing family model, increasing migration.
- changes in forms of social policy with the passive approach to active intervention in the
- sphere of social policy and labour market policy.
- changes in forms of political representation.

To the phenomena strictly relating to the restructuring for the labour market transformations were essential, which include: an increase in the non-governmental and private-sector entities, the development of trade links with foreign countries, change of localizing factors, the influence of foreign direct investment, changing the structure of production due to the change in the direction of sales and specializing, increased labour migration of the population, the development of flexible forms of work and employment, including fixed-term employment, contracted employment, addressed particularly to women and young workers [The role of women in an innovative high-tech entrepreneurship 2010; Branka, Rawtuszko 2009, p. 63-64].

In the collection of the above phenomena can be distinguished, negative effects appearing temporary, and resulting from heritage of a centrally planned, consisting of items such as: underdeveloped technical infrastructure (transport, communication, energy, environment), services, low productivity, employee attitude according to the nature of homo soveticus, [Jałowiecki 2007, p. 101]. As the effects of transformational reforms on employment in the local labour market include:

- a reduction in the demand for traditional skills relating to performance of physical labor,

- preferring by employers higher sophisticated, advanced skills to people with low levels of education and professional experience,
- decline in employment security, what the cause is, in part, deregulation and an increase in employment for a fixed-term contract, [Ramazzotti, Rangone 2006, p. 136-143],
- extension of week work time on working overtime,
- the development of grey and black areas of the labour market, accompanied by growing consumer demand,
- the growth and consolidation of unemployment, work passiveness, especially among the vocational groups, i.e. people with low education level, "unattractive" profession, young people, below 25 years of age, or older men (more than 45 years of age). About a higher risk of unemployment also decides the specified marital status, number of children, place of residence (town or village) as well as house property or rented apartment.

To decrease the influence of the negative phenomena a long term policy perspective is needed to adapt to requirements as high labour productivity and the efficiency of the management, technological advancement, broad access to capital, a high level of investment of individual and in society as well.

CONCLUSIONS

From consideration results some relevant insights. Literature sources indicate the importance of restructuring for the improvement of the employment situation in poviats. Many local markets, which still have no appropriate structural transformations, started too late to the implementation of the changes. The authorities of these locations to this day were not enough effective to opt for example on alteration or sale of fixed assets to be used for the purposes corresponding to the current long term needs of residents. The lack of decision or legal problems stop the dynamics of change, because one of the system component surrender to the change - changes the following parts. In this way, appears social and economic response as labour emigration and passiveness.

On the basis of the study can also be raised that the average employment in poviat is determined by, the external environment, such as: existence of a school, level of wages, labour market institutions. The elimination factors originating from outside the community's system is impossible. Endogenous change and influence of the environment, will always integrally develop the structure of employment factors, as local supply and demand side of the labour market. The basic problem, however, is whether a critical mass of local economy stimulates local development [Report on innovating for sustainable growth: a bio economy for Europe 2013, 21.10.2016], or whether it is necessary to support it from outside for production run exceeding internal needs, for export to the outside market.

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Przemysław Żukiewicz[37]

POLISH RAILWAY POLICY – THEORETICAL BACKGROUND FOR A NEOINSTITUTIONAL ANALYSIS

Abstract: The aim of this article is to analyse the term of railway policy – which should be treated as a part of public policy – and to apply this concept into the analysis of the Polish case. Theoretical aspects of the analysis were based on the neoinstitutional paradigm's assumptions and it was useful especially for redefining the nature of relationship between social needs in the field of public transport and the opportunities and challenges facing the state. The author verified two main hypotheses: a) the historical context is one of the most important factors influencing on the conditions of a rail system; b) in Poland after 1989 there was no coherent vision of the reform of the rail sector and that was the main reason why many of rail reforms have failed.

Key words: railway policy, transport policy, public policy, sustainable transport, neoinstitutionalism.

INTRODUCTION

Railway policy is not a frequent subject of scientific analysis. For many years it was treated as a part of economic research field. The researchers have sawn the railway companies as autonomous entities undertaking activities on a specific market. The specificity of this market was characterised by a strong position of the state (as the owner of the infrastructure – railways, railway stations, traction – and transport companies as well) and the lack of convincing arguments in the dispute over the borders of state intervention into the public transport sector [Fajczak-Kowalska, 2013]. A lesser part of analyses was based on the legal and administrative aspects of the functioning of the railway market. Its authors were focused on the rules framing the activities of the sector and on the functions of public administration in the organization of railway transport [Stasikowski, 2013].

In the past 20 years in Europe some researchers began to make their research seeing railway policy in a broader (than just economic or legal) context. That was connected with an increasing level of awareness of the public transport importance in everyday life and with the debate on environmental threats in the modern world. Coming to a conclusion that rail transport is a good alternative to road transport in meeting the needs of mobility within the rapidly growing cities and between metropolitan areas [Warren, 2014], researchers have increasingly analyzed and explained the social expectations toward railway systems, have drawn attention to the political and administrative barriers of public transport development and have treated it as an essential element of sustainable development policies (including environmental policy, energy policy and social policy) [van Wee, Annema, Banister, 2013; Favre, 2014].

The above described paradigm places railway policy in the broader context of decision-making process implemented by public institutions, which is a part of sectoral public policies creating. These are strategic decisions (basing on the model of applied solutions and answering to the question whether the rail transport sector should remain in the area of public services or whether it should be commercialized and privatized) as well as pragmatic decisions (referring to the current problems of the functioning of the railway market in the current legal and economic circumstances). The decision are influenced by the actors who implement some interests that cannot be convergent: politicians, civil servants, managers of public and private railway companies, representatives of local governments, NGO's activists, academics and finally inhabitants or citizens interested in the development of rail transport. Railway policy is also created on three different levels: international (European Union), national and regional/local.

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To describe and explain the process of creation and implementation of railway policy of the state, it is not enough, however, to point out the actors who have a dominant influence on its direction and vision, and to reconstruct some specific strategies. Because each public policy (including transport policy and railway policy) is formed in a specific social context, and responds to specific societal challenges, scientists must also find answers to the questions on the historical context of decisions undertaken by public institutions. Hence, Helen Dyrhauge proposes to use a combination of approaches in the study of historical institutionalism and rational choice institutionalism [Dyrhauge, 2013, p. 10–11]. Dyrhauge's conclusions have defined a framework for this research. First part of the Polish case analysis is devoted to the historical aspects of the development of Polish railway policy, while the second part is devoted to the reconstruction of railway policy made by Polish governments after the democratic turn in 1989.

THE HISTORICAL BACKGROUND OF THE POLISH RAILWAY POLICY

The first railway line on the territory of contemporary Poland was opened on May 21st, 1842. That was the 26-kilometer route between two Silesian cities: Wroclaw and Olawa. This event has been treated as a first stage of a larger investment – the railway line that would connect two important regions, Upper Silesia and Lower Silesia (and their capitals Katowice and Wroclaw). Three years later – on June 14th, 1845 – it was launched another major railway line between Warszawa and Grodzisk Mazowiecki. It was the beginning of a strategic route that was later called *Warsaw–Vienna Railway* [Paszke, 2015, p. 9–14]. However, at that time the Polish territory was distributed between three other countries: Prussia, Russia and Austria-Hungary. Nonetheless the then made investments have rescued up to the present day and now they are important elements of the national rail network.

It was a period between 1842 and 1864 when the Polish territory annexed by Prussia intense developed. At that time the new lines connected large cities Wroclaw and Poznan (*Railway Wroclaw-Poznan-Glogow*), Poznan and Szczecin (*Railway Poznan-Stargard*) as well as Wroclaw and Katowice (*Upper Silesian Railway*). The pressure was also put on the connection between the large Prussian cities and the cities incorporated into Prussia in the late eighteenth century: Berlin and Szczecin (*Railway Berlin-Szczecin*), Berlin, Bydgoszcz and Gdańsk (*East Royal Railway*) as well as Wroclaw and Berlin (*Railway Berlin-Wroclaw*). Against this background, achievements of the railway companies that build some routes in areas belonging to Russia and Austria-Hungary were rather modest. In those years only the *Warsaw-Vienna Railway*, *Warsaw-Bydgoszcz Railway* and the longest *Warsaw-St. Petersburg Railway* were constructed in the Russian partition [Stankiewicz, Stiasny, 2011, map T1]. The authorities of the Austria-Hungarian section decided to build a railway line dividing it to three phases but the main goal of the investment was to connect Vienna and Lviv.

The disparity between the scope of railway investments in the area of Prussia and the number of new railway lines formed in the Russian and Austria-Hungarian partitions was still increasing until the outbreak of the First World War (1864–1914). The map reflecting the status of the railway lines in the three different partitions shows clearly how significant role was played by the railways in the development of the Prussian state, and how little strategic importance was attributed to the rail investments in the Russian zone. In the latter a significant progress was observed only during the First World War, when it became necessary – for the military reasons – a significant intensification of efforts to improve the density of the railway network [Stankiewicz, Stiasny, 2011, map T2].

After Poland regained independence in 1918, and after the state stabilized its borders in the next years, its authorities began to implement the strategic railway investment, which was supposed to be a rail link between the new port of Gdynia (to the north of the country) and the most industrialized region of Upper Silesia (to the south). Between 1926 and 1933 it was established the

Coal Thoroughfare, whose primary purpose was supposed to be the rail transport of coal from the south to the north. Other investments were more important for the passenger. The route Strzalkowo–Kutno was built in order to improve transport capabilities between Warsaw (formerly the Russian partition) and Poznan (formerly the Prussian partition), the route Toruń–Sierpc–Nasielsk had to improve the transportation system between Warsaw and Bydgoszcz, and the lines Warsaw–Radom and Krakow–Tunel could enable travelling between Warsaw and Krakow. A few strategic investments was completed to the eastern areas of the former Russian partition, which resulted in a further expansion of the disparity in the density of the railway network [see more: Dylewski, 2012, p. 111–118].

The Second World War resulted in a transformation of the Polish political and international position. In the undemocratic Polish People's Republic (PRL), a country remaining under the control of the Soviet Union, the authorities have paid their attention to strengthening the strategic role of Upper Silesia for a centrally planned economy. The two largest investments in the period 1945–1989 could serve that purpose. It was the Central Main Line between Warsaw and Katowice and the Metallurgical-Sulfurous Line (broad-gauge railway between Upper Silesia and Polish-Soviet border). Polish authorities decided also at that time on the beginning of the process of important railway lines' electrification [Dylewski, 2012, p. 166–173].

POLISH RAILWAY POLICY AFTER DEMOCRATIC TURN

After the democratic turn in 1989 the new government faced major economic challenges related to the railway sector. Relatively dense railway network was the main reason why any significant large railway investment was implemented in the 90s and at the first decade of the 21st century. However, there was a strong need of the reorganization of the entire structure of the then state-owned company Polish State Railways (*Polskie Koleje Państwowe* – PKP), which had indeed a monopoly on freight and passenger rail transportation, but from the standpoint of the capitalist economy it was inefficient managed. At the same time PKP played a very important socio-economic role: providing a commute to work or school, as well as relatively fast cargo. However, a thorough reform of the railway was moved away in time, because there was a well-grounded fear that the company's restructuring could arouse a violent social resistance (some redundancies of workers and strikes were expected especially).

The period of "hibernation" lasted for the 90's. Some attempts of reforms were blocked by very strong trade unions. During the strikes the trade union's negotiators obtained from the governments promises of wage increases and job guarantees. In the early 90's the widespread privatization process did not contribute to any company related to the railway industry. The absence of the corrective action was accompanied by abandoning new investments: transfers of public funds were spent on the ongoing management of enterprises (mainly for salaries, maintenance of the infrastructure and the purchase of services from third parties) and purchasing of the new railway rolling stock as well as construction of the new railway lines were not carried out. In addition, the level of the PKP's debt was steadily increasing.

The first – after the democratic turmoil – government which decided to reform the railway sector in Poland was the Jerzy Buzek's right-wing government. The economic transformation has passed more than 10 years since then. On 8th of September, 2000 it was enacted the law on commercialization, restructuring and privatization of the state enterprise Polish State Railways (PKP). On the basis of this law there was established the company Polish State Railways Ltd. (PKP SA) (it was created as a *de facto* holding), in which the Treasury remained the sole shareholder ("commercialization"). Then PKP SA created some daughter-companies for passenger and cargo carriages as well as for the lines management – *inter alia*: PKP Cargo, PKP Intercity, PKP Power Engineering, PKP Polish Railway Lines ("restructuring"). The Act also provided the possibility of

trading the shares held by the Treasury in order to increase the capital of the company ("privatization") [*Ustawa o komercjalizacji…*, Dz.U. 2000 nr 84 poz. 948].

The most far-reaching consequence from the point of view of the passengers was the separation of the two different companies responsible for passenger transport. The first one was PKP Intercity, which was responsible for the implementation of the so-called "high segment" transport offer. Some of the long-distance trains with the higher standard and the short time of travel belonged to this segment (Express trains, InterCity trains and selected international trains). Polish authorities acknowledged that in the passenger carriage it was the most profitable segment of the market and the company could be relatively quickly privatized. The other passenger company was the PKP Regional Carriage (*PKP Przewozy Regionalne* – PKP PR), which had to implement the local offer, but with an average standard of services (local trains and regional fast trains) [Taylor, Ciechański, 2010, p. 551–552]. It was assumed that this company was established primarily for fulfilling some social functions and it will be required subsidies from the state budget (at the level of 800 million PLN), but on the other hand the government expected that the new management of the company could increase financial efficiency and optimize employment.

An important result of the reform in 2001 was also the separation of PKP Cargo, which was responsible for freight. The government did not anticipate – mainly for reasons of desire to maintain control over the security operation – the possibility to privatize PKP Polish Railway Lines, which was to manage the railway infrastructure.

In addition to the three strategic objectives of the reform (commercialization, restructuring and privatization), the ministry also planned to allocate assets to individual companies responsible for certain elements of an efficient railway system. However, this process took many years and did not bring the assumed high efficiency of budgetary enterprises. To the contrary, it caused numerous administrative and organizational problems mainly related to the dispersal of responsibility for actions and competency disputes between the newly established companies. Most experts found irrational, for example, the separation of several companies that were responsible for some elements of railway infrastructure: PKP PLK was responsible for tracks and power stations and Telekom was responsible for tractions and telecommunications necessary to coordinate the rail traffic.

Because the government did not fulfill the promises about announced subsidy for PKP PR (the reason was the budget deficit at the beginning of the 21st century) the amount of the company's debt has significantly increased over the next few years. Some activities of PKP Intercity has not brought the expected improvement of the company's financial situation as well. Mutual accumulation of debts of the sole railway companies has caused many problems around the PKP holding. That was a period when reforms of the railway system was sorely felt by passengers. The need to reduce the number of unprofitable rail connections meant that the railway companies limited the frequency of trains on many local lines. One of the reasons for this was the lack of adequate rolling stock that enables them to provide services on the low frequency lines (in contrast to the Czech Republic Poland have never invested in a small rail buses) [Rytel, 2013]. This led to the bizarre and cost-intensive situation in which local transport was organized in such a way that trains on the local route were consisted of one or two cars and diesel locomotive. Indebtedness of railway companies resulted, however, that they have no funds for new investments that would help keep traffic on many of the local – but important for the communities – railway lines [see more: Taylor, 2007, p. 193–208].

TOWARD REGIONAL RAILWAYS

In a further phase of reform the government decided to transform the business structure of the two largest operating companies: PKP PR and PKP Intercity [*Ustawa o zmianie ustawy o komercjalizacji…*, Dz.U. 2008 nr 206 poz. 1289]. The latter company took over the operation of all long-distance trains from 1st December, 2008. The first one could not remain as a state company:

Regional Carriages (*Przewozy Regionalne* – PR) were created to support the local and regional transport, and 16 regional governments become the owner of the company. The division of rolling stock between the companies, however, caused a lot of controversy. PKP Intercity has taken over cars and electric locomotive, and PR has received a few cars dedicated to non-electrified lines and most of the electric multiple units EN57 produced decades ago and do not meet the standards for regional trains at the beginning of the 21st century.

Today, the situation of the regional railways is more complicated (see: Table 1). The regions divided themselves into two groups. The first one wants to see every province as a creator of its own railway company, which could be responsible for the rail transport in the region. The second one wants to restructure PR and maintain the ownership structure of the company. As a result, there has been a kind of split. After the institutional blocking of the exit from the PR some regional governments decided to create specific solutions in their provinces.

The Mazowieckie Voivodship (which can be treated as a strategic region due to the capital of the state –

Warsaw) came in 2004 to sign an agreement on the establishment of the company *Masovian Railways* (Koleje Mazowieckie – KM) by the regional government and PKP PR with the division of shares in the ratio of 51–49%. The first trains of the new company began to operate on the selected lines already in 2005. The dynamic development of the company, however, was influenced by the sale of shares by PKP PR. Since 2008, the sole owner of KM is the regional government. At the same the time the urban agglomeration railway began to operate being supported by the capital's city council. The Warsaw company managing urban public transport (City Transport Board) decided to create a daughter-company – Fast City Rail. Today it operates on the 4 regular railway lines connecting the centre of the capital with some suburban areas. The Mazowieckie Voivodship is the only region in Poland, where the local railways are organized without the company *Regional Carriages* (PR).

In the Kujawsko-Pomorskie Voivodship the special agreement was signed in 2007 between the regional government and *Arriva PCC*. The company had to operate on the non-electrified lines in the region (approx. 40% of all operating trains). In 2010 the regional government extended the validity of the contract for 10 consecutive years. In 2013 *Arriva RP* increased its share of the regional transport market, taking over operation some of the electrified lines (approx. 70% of all operating trains). The pressure of the other owners of *Regional Carriages* (PR) forced, however, the governor of the Kujawsko-Pomorskie Voivodship to back out of a promise to open a tender to operate electrified lines after 2015 and hand over the operation of these regional railway lines into PR.

Another situation is established in the Pomorskie Voivodship. There is a transportation axis in which suburban trains connect two main cities of the region: Gdańsk and Gdynia, and – on extensions – Tczew and Wejherowo. Even before the establishment of PKP holding in 2003, a special company dedicated to manage this line was created. It was called PKP Rapid Urban Rail in Trójmiasto (it is the name of the 3 main cities of the region: Gdańsk, Sopot and Gdynia). Currently, the ownership structure of the company is very complex. The majority of shares are still by PKP SA (50.47%), while the other shareholders are: State Treasury represented by the Minister of Finance (18.25%), Pomorskie Voivodship (10.96%), the city of Gdańsk (13.54%), the city of Sopot (2.26%), the city of Gdynia (3.10%), the city of Pruszcz Gdanski (1.29%) and the city of Rumia (0.13%). The case was further complicated by the local provincial appointment of a new company, *Pomeranian Metropolitan Railway* (Pomorska Kolej Metropolitalna – PKM), whose task was to supervise the construction of a new railway line connecting Gdańsk, Gdynia and the Lech Walesa airport. After the completion of the investment PKM remained the infrastructure's manager, and PKP Rapid Urban Rail became the sole operator of the trains.

In the Voivodships: Dolnośląskie, Łódzkie, Śląskie, Wielkopolskie and Małopolskie the governments decided to establish their own rail transport companies and to gradual hand-over of railway lines operating into regional carriers. The consequence of this process is a gradual decline of the Regional Carriages (PR) sharing in the passenger traffic market on these areas. In many regions process of creation of the new companies triggered many controversies and turmoil. In the Śląskie Voivodship it turned out, for example, that, contrary to previous announcements, the company did not have sufficient park a train, causing paralysis of the transport for weeks and the resignation of the company's board, responsible for this state of affairs. We must admit, however, that the regional governments in the last years budgetary managed to make a number of significant investments of trains as well as restore the connection lines have long been unused (Wroclaw – Trzebnica in Dolnośląskie Voivodship) or build a completely new connections (Krakow Main Station – Krakow Airport in Małopolskie Voivodship).

Table 1. The railways companies in the Polish regions

Region	Operator	Operator's owner
Dolnośląskie	Lower Silesia Railways Inc.	Self-government of the Lower Silesia region
Kujawsko-Pomorskie	Arriva RP Ltd.	Deutsche Bahn
Łódzkie	Agglomeration Railways of Łódź Ltd.	Self-government of the Łódź region
Małopolskie	Lesser Polish Railways Ltd.	Self-government of the Lesser Poland region
Mazowieckie	Mazovian Railways Ltd.	Self-government of the Mazovian region
Śląskie	Silesian Railways Ltd.	Self-government of the Silesian region
Wielkopolskie	Greater Polish Railways Ltd.	Self-government of the Greater Poland region

Source: Own elaboration

THE NEW LIBERAL WAVE IN THE POLISH RAILWAY POLICY

Polish accession to the European Union in 2004 opened new possibilities for financing and development of railway sector (especially – for rolling stock and infrastructure). The first period of the EU structural funds' absorption, however, have shown clearly that Polish railway companies (in the field of transport and infrastructure as well) were not prepared for contesting and – if the contest would be successfully – spending European funds. Institutional barriers and complicated structures of the companies have made efficient management impossible. Therefore, after the 2011 parliamentary elections, Donald Tusk's government decided to change the Polish railway policy.

In order to change management style in many of railway companies the government decided to engage some managers who have gained experience outside the railway sector. The aim of this operation was to optimize costs and overcome barriers of organizational culture, which became the cause of many mistakes made by the former managers. The Polish media ironically called new managers "cash machines", because they never conceal that their main purpose is to care for the finance of the companies they managed [Kowanda, 2015]. After 2011 it was began the process of privatization of some important companies belonging to the PKP group. The government decided to sell a block of shares of PKP Cargo and sell the company PKP Energy. The latter had a monopolist position, because it was the only operator of the substations energizing contact lines on a railway network. Many of these decisions were criticized by opposition parties and trade unions. After the 2015 parliamentary elections it was appointed a new government with a Prime Minister Beata Szydło and she does not intend to continue the described rail policy. Many of railway managers were dismissed or have resigned from their posts during the first months of the Szydło's government [Kowanda, 2015].

CONCLUSION

There is a need to include a term of railway policy of the state into the Polish scientific discourse. Researchers should treat it as a part of transport policy, and – more generally – of public policy. It seems reasonable to adopt some research methods, which are used in the scientific sub-discipline of public policy. The author's proposal from this article is to apply basic assumptions of the neoinstitutional paradigm to the case study of Polish railway policy. The author also proved that the historical context is an important factor determining contemporary railway policy. It still has a huge impact on the map of the railway network in Poland and on the problems that are linked with an unequal potential of the transport sector in different parts of the country. Furthermore, the author shows that some attempts of the Polish railway policy reforms faced many barriers, and that the governments did not have a long-term vision of development of the railway sector in Poland. Further studies based on neoinstitutional paradigm should focus on some specific problems of Polish railway policy (for example: regional railways, rail freight transport, high speed rail) and comparative analyses of the Polish and other European countries' cases.

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INNOVATIVE ACTIVITY OF WOOD PROCESSING AND FURNITURE ENTERPRISES IN THE YEARS 2012-2015

Abstract: The article presents the diagnostis of innovation activities in wood products and furniture industries. Huge risk and belief that R&D activities are of low efficiency in the Polish conditions as well as long duration of the process lead to relatively low level of investment of industrial enterprises in R&D. The domination of investment expenditure reflects the technological character of innovation introduced in wood and furniture industry. However, the level of innovativeness in wood industry as compared to industry in general is much lower.

Key words: innovativeness, wood working industry, furniture industre

INTRODUCTION

Long-term and effective development of industrial enterprises, and in consequence all the national economy at the present stage of social development is closely connected with the ability of enterprises to use their activities to attain scientific and technological development. The application of scientific and technological knowledge to industrial production and the use of all types of new solutions for various spheres of activities of an enterprise is the mark of its modernity and innovation. From this point of view, innovations are perceived as one of the basic tools in the creation of the added value of an enterprise. They influence in a significant way the competitiveness of enterprises and decide to a large extent about their level of development and the dynamics of the development of the national economy as a whole.

Innovative activity may be perceived as a process of adaptiation of scientific and technological progress to production. Innovativeness means introduction of significant changes in the approach used so far, with the application of scientific and technological achievements that induce improvement in the quality of the enterprise's activities. The consequences of these changes are usually certain technological, economic and social profits.

The aim of the innovative activity of enterprises is above all the development of the economic organisation, and therefore gaining competitive edge on the goods and services market. Until recently innovative solutions concerned mostly technical and technological spheres of an enterprise. Presently, the understanding of innovativeness in a company is concentrated not only on introducing innovative solutions in the production process. Innovativeness in an enterprise is perceived as a complex and multifaceted activity, also in spheres not connected with technology. Generally adopted international typology of technological innovations in industry and market services encompasses four types of innovations: technological product innovation, technological process innovation, organisational innovation, marketing innovation.

Despite considerable profits connected with the introduction of innovations, activity in this sphere requires adequate financial input and accepting certain risk. It is also difficult, especially at the initial stage, to assess the profitability of the enterprise.

Promoting and supporting innovative activities in various branches of activity is at present one of the main aims of the economic polity of the EU, including Poland. Adopted Lisbon Strategy defines the significant role of innovative activity in boosting the economic development and increasing competitive edge of enterprises in the European Union. The means of attaining these

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strategic goals was boosting Reaserch and Development and effective adoption of the obtained results by the enterprises.

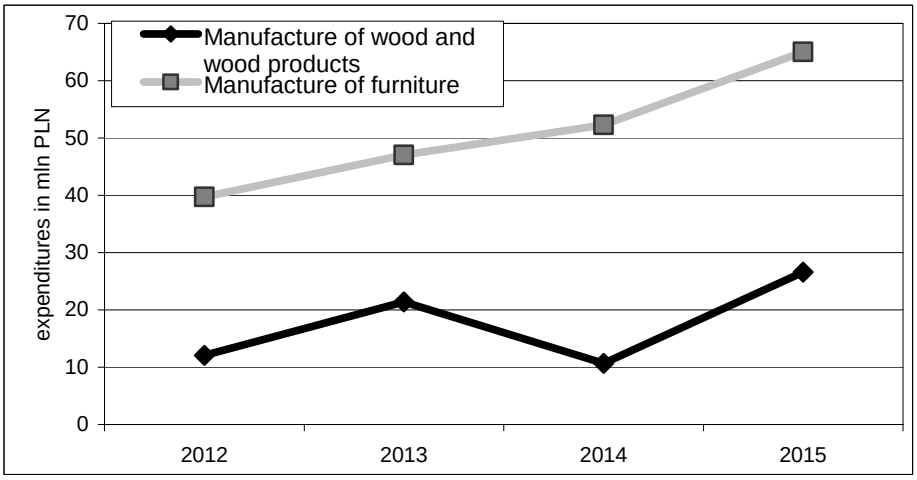
EXPENDITURES ON RESEARCH AND DEVELOPMENT ACTIVITY

Despite wider and wider understanding of the importance of the innovative activity for the development of the Polish economy, involvement in this sphere still is far from the European standards. The important bareer to proper development of the Polish innovation system is lack of relevant funding that leads to underdeveloped R&D activity and lack of transparent and coherent programmes aiming at development of innovative sphere.

The level of funding of R&D in Poland and the structure of sources of funding is significantly different from the European standards, which is reflected in the quality and effciency of the outcome of this activity adopted by the economy. It reflects uderdeveloped sector of high technologies and limits the possibility of creation of relevant infrastructure in this respect.

Huge risk and belief that R&D activities are of low efficiency in the Polish conditions as well as long duration of the process lead to relatively low level of investment of industrial enterprises in R&D. It refers also to wood and furniture enterprises.

Fig.1. Internal spending on R&D in wood and furniture industry in the years 2012-2015



Source: author's evaluation on the basis of CSO's data

Expenditure on R&D is a significant but still insignificant element of innovative activity of Polish wood enterprises (fig 1.). In consecutive years of the studied period the sums increase from 12.1 million PLN in 2012 to 26.6 million PLN in 2015. The highest decrease in expenditure in this sector was done in 2014 - it was a sum of 10.7 million PLN.

Positive trends may be observed in R&D financing in the furniture sector. It is proved by systematic increase in expenditure: from the level of 39.7 million PLN in 2012 to 65 million PLN in 2015.

Expenditure on innovative activity in wood and furniture industry in the years 2012-2015 is shown fig. 2.

Fig.2. Expenditure on innovative activity in wood and furniture industry in the years 2012-2015

Source: author's evaluation on the basis of CSO's data

In consecutive years of the studied period financing innovative activity in wood industry rose from the level of 186,7 million PLN in 2012 to 1,074 billion PLN in 2015. During the period under analysis, apart from 2013, there was a marginal decrease in expenditure on innovative activity in furniture industry enterprises. In furniture industry expenditure on innovation in this period role from the level of 284,7 million in 2013 to 477 million PLN in 2015. The best period in the financing of innovation in wood industry was the year 2012, about 606 million PLN was spent that year.

THE LEVEL AND CHARACTER OF INNOVATION

The directions and level of expenditure of financial resources on innovative activity of wood and furniture industry reflect the character of innovation in these sectors and their dimension. The domination of investment expenditure reflects the technological character of innovation introduced in wood and furniture industry. Technological innovation is understood as objective perfectioning of a product's characteristics or a process or system of distribution existing so far. Percentage of enterprises that introduced new or significant products and processes in wood and furniture industry is shown fig. 3.

A characteristic feature for wood industry and furniture industry is the dominance of process innovation over product innovation . It means that wood companies introduced more innovations concerning the production process than new products. It is a clear departure from the trends in the EU countries, where innovations concern mostly perfecting products and introducing new ones.

From 2010 to 2015 there were more enterprises which introduced process innovations than those which implemented product innovations (Fig. 3). In the wood industry the share of enterprises which introduced process innovations between 2010 and 2012 was 12,8%, whereas the share of those which introduced product innovations was 11.6%. Between 2013 and 2015 there was a significant decrease in the share of companies that introduced process and product innovations. The share was 6.7% and 5.6%, respectively. In furniture industry between 2010 and 2015 there was a decrease in the share of enterprises which introduced product and process innovations It is necessary to note the equalising tendencies in the share of product and process innovations. It is in agreement with the trend in European countries, where product innovations are predominant.

Fig 3. Percentage of enterprises that introduced new or significant products and processes in wood and furniture industry.

Source: author's evaluation on the basis of CSO's data

An important measure of effectiveness of innovative processes is the index of perfecting the production process, denoting the participation in sold production new and modernised products in the total value of sold production (fig. 4).

The lowest level of sale of new and modernised products was shown by wood processing enterprises. The percentage of sale of this type of products in the years 2013-2015 systematically falling. It was as low as 9,1% in 2013 and 7,8% in 2015.

Fig. 4. Percentage of sold production of new and modernised products in wood and furniture production

Source: author's evaluation on the basis of CSO's data

The sale of innovative products produced by the furniture industry in the years 2012-2015 ranged from 7,1 to 10,4%. Better results of sales of innovative products obtained in the furniture industry can be explained by the competitive edge of product innovation. Improvement of product quality, widening the offer of products increases the competitiveness of a company. Introduction of product innovation allows to expand and diversify effectively, and therefore eliminate high degree of vulnerability of a company to disturbance in company's environement.

SUMMARY

The position of industrial enterprises in ever-changing economic environment to a large extent depends on the proper development of widely understood innovative activity. Successful companies are mostly those that a creative, innovative, flexible and are able to manage those factors effectively. Modernity of companies and their innovativeness are to a large extend dependent on the effective use of technological advances in their operations. This requires adequate funding of R&D activity.

In the structure of expenditure on innovative activities in the wood and furniture industry, financial means are used most of all for technological development of workplace. Very small percentage of expenditure is used for R&D activtiy and non-material technologies.

Compared to the level of innovativeness of the west European countries, the wood industry in Poland is characterised by low level of innovativeness. Contrary to the European trends, where product innovations give the competitve edge, in the Polish wood industry dominate the process innovation. A little better results in this respect are shown by the furniture industry. The development of innovative activity in this sector in the recent decade lead to a balance between introduced process and product innovations.

The lack of proper development of innovative activity in the Polish economy is a result of a number of obstacles that effectively litmit activities in this sphere. Among chief factors that make innovative activity difficult are: lack of own and external resources for financing innovative activity, high costs of introducing innovations, lack of properly qualified staff and lack of access to scientific and technological knowledge.

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