Problemy ekonomii, polityki ekonomicznej i finansów publicznych

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Spis treści

Wstęp

Problemy ekonomii, polityki ekonomicznej i finansów publicznych wydajemy w serii Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu. Niniejsza publikacja, stanowiąca pierwszą z czterech części materiałów konferencyjnych, zawiera 36 opracowań, w tym sześć w języku angielskim. Zostały one poświęcone aktualnym problemom naukowo-badawczym z zakresu teorii ekonomii, realizacji polityki ekonomicznej – w wymiarze mikro- i makroekonomicznym – oraz zagadnieniom związanym ze stanem finansów publicznych w Polsce i na świecie.

Liczne grono autorów prezentuje wyniki swoich dociekań naukowych w postaci teoretycznych i empirycznych analiz związanych z polityką fiskalną na szczeblu centralnym i samorządowym, wykorzystaniem instrumentów polityki podatkowej w odniesieniu do opodatkowania kapitału, pracy i konsumpcji oraz z problemami polityki pieniężnej i rynku kapitałowego w skali krajowej i międzynarodowej. Ponadto zeszyt zawiera opracowania dotyczące nierówności społecznych, polityki regionalnej i lokalnej, rozwoju produkcji rolnej, obszarów wiejskich i przetwórstwa spożywczego, problemów sektora usług turystycznych i transportowych, jak również rozwoju innowacyjności przedsiębiorstw, efektywności wydatków na B+R oraz polityki państwa w obszarze rynku pracy.

Publikacja nasza jest adresowana do środowisk naukowych i studentów wyższych uczelni oraz osób, które w praktyce zajmują się finansami publicznymi, współczesnymi problemami polityki ekonomicznej czy ekonomii. Poszczególne artykuły były recenzowane przez profesorów uniwersytetów, w większości kierowników katedr ekonomii lub polityki ekonomicznej. Za ich rzetelne recenzje chciałbym serdecznie podziękować. Dziękuję również pracownikom Katedry Ekonomii i Polityki Ekonomicznej Uniwersytetu Ekonomicznego we Wrocławiu oraz wszystkim osobom i instytucjom zaangażowanym w powstanie tej publikacji.

Jestem w pełni przekonany, że książka *Problemy ekonomii, polityki ekonomicznej i finansów publicznych* będzie Państwa inspirować do dalszych badań i dociekań naukowych oraz przyczyni się do powstania równie interesujących opracowań w przyszłości.

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WITHIN AND BETWEEN SECTORAL SOURCES OF WAGE INEQUALITY ACROSS EUROPEAN UNION COUNTRIES

WEWNĄTRZ- I MIĘDZYSEKTOROWE ŹRÓDŁA NIERÓWNOŚCI PŁACOWYCH POMIĘDZY PAŃSTWAMI UNII EUROPEJSKIEJ

Summary: The paper presents results of research about wage inequality across European Union member states. It aims at specifying the importance of sectoral features of the countries as a source of differentiation in a level of remunerations. To achieve this goal Theil index concerning the average wages and salaries per employee in EU members was calculated. Its disaggregation into within and between sectoral components enabled to conclude about the importance of structural pattern of development for wage differentiation. The analysis proved that sectoral characteristics are responsible for about 1/3 of the wage inequality across EU countries. However, the most important source of the differentiation is a general level of socio-economic development. Moreover, considering changes in a level of wage inequality in the period 2004-2013 there was drawn a conclusion about a convergence of remunerations in EU induced mainly by equalization of the general level of development. Thus the importance of structural features as a source of inequality has grown. The research also allowed to indicate the most modern branches as the ones with the lowest level of wage inequality across EU countries. More traditional kinds of activity, primarily agriculture, were experiencing the highest level of differentiation in remunerations in the whole period of the analysis.

Keywords: wage inequality, convergence, sectors.

Streszczenie: W opracowaniu przedstawiono wyniki badań nad nierównościami płacowymi pomiędzy państwami członkowskimi Unii Europejskiej. Celem artykułu było określenie znaczenia sektorowych charakterystyk tych państw jako źródła zróżnicowań poziomu wynagrodzeń. Dla realizacji tego zamierzenia obliczono wartości indeksu Theila dla średnich wynagrodzeń na pracującego w krajach UE. Dezagregacja tego współczynnika na składowe wewnątrz- i międzysektorowe umożliwiła wnioskowanie na temat znaczenia strukturalnego wzorca rozwoju dla zróżnicowań płacowych. Analizy wskazały, że charakterystyki sektorowe odpowiadają za około 1/3 nierówności płacowych istniejących pomiędzy państwami UE. Najważniejszym źródłem zróżnicowań jest jednak ogólny poziom rozwoju społeczno-gospodarczego. Ponadto, biorąc pod uwagę zmiany poziomu nierówności płacowych w okresie

2004-2013, wyciągnięto wniosek o występowaniu konwergencji wynagrodzeń w UE, wynikającej głównie z wyrównywania się ogólnego poziomu rozwoju. W efekcie wzrosło znaczenie cech strukturalnych jako źródła nierówności. Badania pozwoliły również wskazać na najbardziej nowoczesne branże jako te o najniższym poziomie nierówności płacowych pomiędzy państwami UE. Bardziej tradycyjne rodzaje działalności, przede wszystkim rolnictwo, charakteryzowały się najwyższym zróżnicowaniem wynagrodzeń w całym okresie analizy.

Słowa kluczowe: nierówności płacowe, konwergencja, sektory.

1. Introduction

A growing literature is focused on the phenomena of inequality and poverty as one of the main problems of modern world. Although poverty seems to reveal a declining tendency, it is claimed that inequality increases in most countries around the world (compare e.g. [Alvaredo, Gasparini 2013; OECD 2015]).

The most often concerned issues in this topic are connected with relationships between growth and inequality, while inequality is perceived as being in a strong relationships with poverty. There are identified diversified channels of mutual influence of these phenomena. One of them is constituted by a sectoral structure of economy, described by diversified features of each sector specified mainly by labour efficiency. The analysis in this stream concerns two issues: the first one is connected with sectoral drivers of growth (and *vice versa* structural changes influenced by growth), while the other covers a problem of sectoral relations with employment and poverty.

Within the former it is claimed that both in developed and developing countries the contribution of services to total growth is higher than industry's contribution [Ghani, Goswami, Kharas 2012, p.1]. In a search for sources of growth an issue of labour productivity growth is often considered and empirically tested. D. Kucera and L. Roncolato [2012] argue that within-sector effects are more important than employment reallocation effects for an economic growth induced by growth of labour productivity and that strong differences between countries appear when specifying a role of each sector for growth. They also discuss the results of studies of some other authors which generally supports their conclusions [Kucera, Roncolato 2012, pp. 4-9]. In contrary, the analysis conducted by M. Sassi suggests that in European regional convergence the shift effect dominates aggregate productivity growth [Sassi 2011, p. 112]. It suggests that the relationships may depend on the stage of development which changes both the importance of each sector and character of the socio-economic transition.

Within the later N. Loayza and C. Raddatz [2006] conduct research about influence of sectoral decomposition of growth on poverty alleviation. They stress a role of labour-intensive sectors, such as agriculture, construction and industry. They

also conclude that this kind of growth improves a situation of the poor without the necessity of redistribution, because it increases an absolute level of wages not changing the inequality. N. Loayza and C. Raddatz also cite other studies, which indicate that agriculture and services, contrary to industry, usually limit poverty [Loayza, Raddatz 2006, pp. 1-2]. Studies presented by E. Ghani and H. Kharas support this view and claim that for developing countries growth in the service sector is more closely correlated with poverty reduction than growth in agriculture. This process is connected with job creation, which additionally appears to be more gender inclusive [Ghani, Kharas 2010, pp. 2-4]. Thus the role of each sector in limiting poverty seems to be complex depending on many characteristics of each branch. Moreover, when considering a general pattern of structural changes, C. Paunov [2013] points out that in the development process the transition towards modern sectors (different at different stages of development) may lead to the increase in inequality. It is usually connected with differences in skills and training of employees. By the author, to achieve a balance between growth and inequality its necessary to facilitate the dissemination of innovations and technologies between sectors [Paunov 2013, p. 7]. Some sectoral aspects of inequality are also taken up in OECD Report [OECD 2015]. It is suggested that the growth of inequality in OECD countries is connected with changes in a pattern of work. However, the changes were mainly a result of within sectors shifts in tasks, not the ones which are between sectors [OECD 2015, p. 147].

A discussion about sectoral aspects of inequality does not give an unequivocal answer about an importance of structural differences as well as about a role of each sector in limiting inequality. The relationship probably changes in the development process. The situation, however, creates necessity to search for additional evidence supporting statements about importance of sectoral composition of economy in resolving social problems. It is also unavailable to try to specify a role of each sector.

Considering such ambiguity in the literature an aim of the paper is to assess the influence between and within sectoral differences in generating inequality in 27 EU (European Union) countries (without Croatia). We took into account a wage inequality as the most important part of an income inequality. We used Eurostat data about gross wages and salaries at current prices in euro and total employment by domestic concept to get an average remuneration per employee in branch aggregates [www1; www2]. To evaluate a role of structural differences in the creation of wage inequality across EU countries we calculated Theil index (IT1) in a period 2004--2013 years. Decomposition of the measure made it possible to assess the importance within and between sectoral sources of inequality. Within sectoral component represents general differences in socio-economic development of each country, while between sectoral component reflects the importance of structural relations for inequality across countries. Moreover, we presented Theil index values calculated separately for 10 branch aggregates in the whole period to specify sectors which were inducing and sectors which were reducing international inequality in EU. We adopted branch aggregation NACE Rev. 2 made by Eurostat as:

- Agriculture, forestry and fishing – section A,
- Industry (except construction) – sections B-E,
- Construction – section F,
- Wholesale and retail trade, transport, accommodation and food service activities – sections G-I,
- Information and communication – section J,
- Financial and insurance activities – section K,
- Real estate activities – section L,
- Professional, scientific and technical activities; administrative and support service activities – sections M-N,
- Public administration, defence, education, human health and social work activities – sections O-Q,
- Arts, entertainment and recreation; other service activities; activities of household and extra-territorial organizations and bodies – sections R-U.

In the study we not only try to specify the importance of sectoral structure of the EU economies for inequality but simultaneously, taking a dynamic approach, we try to assess the results of the integration process in a dimension of convergence of remunerations. Thus the conclusions about the sectoral influence on inequality may be used in forming advice for cohesion policy.

2. Differences in remunerations across European Union countries

Despite strong integrational efforts taken within EU we can still observe essential differences in a level of remunerations among EU countries. They result from differences in work efficiency and are connected with long-standing differences in capital intensity and technological advancement. They also stem from institutional framework and geopolitical experiences. The differences in a level of remunerations reflect also a general level of socio-economic development, which is still diversified within EU. However, the process of convergence makes the differences less intensive both in a dimension of wages and salaries as well as socio-economic development. Data in table 1 present a level of remunerations in each EU member state calculated as a percentage of an average for all EU countries in the period 2004-2013.

We can observe that both in 2013 and in 2004 the highest wages and salaries were in Luxembourg and Denmark, which is correlated with a high level of development of these economies expressed by GDP per capita. The remunerations in these countries were at least twice as high as the EU average. Not far behind were Sweden, Ireland, Finland and Belgium in 2013 and Ireland, United Kingdom, Sweden, Belgium and Finland in 2004, all exceeding 150% of the average. Thus the group of economies offering the best conditions for workers is rather stable in time. However, we can point out at relatively less favourable conditions in the United Kingdom and Ireland at the end of the analysed period and better results of workers in Sweden.

Table 1. Average wages and salaries in each EU country as per cent of average wages and salaries in EU in 2004-2013

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
Belgium	158.85	156.20	154.96	151.39	150.72	152.41	150.31	151.75	153.87	151.46
Bulgaria	10.27	11.30	11.41	12.68	13.85	15.36	16.73	17.52	18.67	18.94
Czech Republic	36.53	39.55	42.09	43.25	48.65	46.12	47.84	49.21	47.85	43.95
Denmark	217.74	216.01	213.23	209.95	209.86	219.20	219.24	217.38	216.33	211.69
Germany	145.47	139.63	134.71	129.76	127.92	128.85	128.51	129.82	131.12	129.89
Estonia	33.70	36.58	39.95	46.77	49.87	47.82	47.59	46.84	48.58	49.93
Ireland	180.30	184.48	185.33	184.06	185.01	184.36	173.94	170.08	168.84	159.50
Greece	69.14	67.89	68.61	68.30	68.02	71.73	66.95	62.87	58.95	52.92
Spain	103.36	102.31	101.60	101.39	104.65	110.28	107.24	106.33	101.87	97.64
France	149.66	148.24	146.68	142.92	141.04	144.01	143.56	143.13	142.76	139.68
Italy	102.19	102.63	101.37	98.61	97.89	99.24	98.63	97.69	96.10	94.29
Cyprus	87.43	87.05	87.58	84.86	85.96	88.80	88.55	88.51	86.36	78.03
Latvia	22.08	26.30	31.04	42.55	49.10	42.18	38.72	40.01	42.62	43.33
Lithuania	25.09	27.27	30.86	33.86	37.95	34.14	36.71	38.26	38.68	39.32
Luxembourg	230.14	229.93	228.62	226.24	223.52	227.27	228.19	228.14	228.04	227.76
Hungary	43.09	45.31	43.41	45.93	47.24	42.80	43.86	43.63	42.03	41.56
Malta	79.98	77.45	78.18	76.57	76.95	79.60	79.11	78.78	79.14	77.06
Netherlands	146.08	142.16	139.57	137.03	136.11	139.77	137.33	135.91	133.54	130.71
Austria	149.63	147.18	145.37	142.75	142.08	145.33	143.13	143.04	143.99	142.12
Poland	28.09	31.66	32.52	33.78	38.89	32.87	37.44	37.33	35.17	-
Portugal	69.82	69.70	68.32	67.58	66.54	68.94	68.84	67.03	63.84	63.71
Romania	12.11	16.30	18.62	22.86	27.13	22.63	20.59	19.79	19.06	19.92
Slovenia	77.92	79.42	80.14	81.07	83.82	85.08	85.73	84.80	82.05	79.18
Slovakia	28.95	31.42	33.70	38.21	41.34	43.99	44.94	45.43	45.93	44.91
Finland	152.62	151.93	149.79	147.71	148.32	152.64	152.66	154.09	155.74	154.06
Sweden	164.28	160.34	159.61	158.45	153.30	143.43	158.95	169.88	177.88	176.09
United Kingdom	175.46	171.76	172.75	171.46	144.23	131.18	134.69	132.74	141.00	132.35

*Calculated for 26 EU countries – without Poland.

Source: own calculation based on Eurostat data [www1; www2].

On the other hand, within countries where remunerations are at the lowest level we can specify: Bulgaria, Romania and Poland. Moreover, Lithuania and Latvia were at lower level than Poland in 2004, but, within the period after 2004, they experienced a relatively dynamic increase in remunerations. All these poor economies take a lot of advantages of EU integration and improve their money conditions for workers in comparison to the EU average. In spite of this they still offer relatively unattractive wages and salaries reaching not more than 45% of the average.

Comparing the differences in remunerations in time we can generally conclude that the differences have narrowed and we can observe a convergence of money conditions for employees. The process of integration resulted in a decrease of relative remunerations in well-developed economies and an increase in the catching-up countries. The exceptions reflect a special conditions and results of each economy. In a group of the rich countries a better situation of employees was in Sweden and Finland. In a group of the poor countries a worse situation of employees was observed in Greece, Cyprus, Hungary, Malta and Portugal. Additionally, Italy, achieving better results than the average in 2004, at the end of the analysed period was in the group of poorer economies. Diversified results can be connected with institutional conditions and socio-economic policy adopted in the countries. We have to remember that remunerations were strongly influenced by the general condition of the economies within a crisis period. The crisis caused serious difficulties in the whole economy of each country, and especially in the labour markets. This can especially explain unfavourable results of the Southern countries.

3. Sources of wage inequality across European Union countries

Apart from comparisons of the level of remunerations in each country to the EU average, general wage inequality across EU countries may be reflected by a measure of entropy, such as Theil index. Additive disaggregation of the measure helps us to understand sources of the wage differentiation. Especially it can point out the importance of differences in wages and salaries observed within specified sector of economic activity when we compare different countries (within sectoral component of Theil index) and the importance of differences observed between different sectors (between sectoral component of Theil index). The first one would prevail when inequality was driven mainly by a general level of countries' development resulting from differences in their potential and institutional conditions. Along with economic convergence the influence of this component will probably decline. The second one would prevail if inequality was mainly a result of structural differences, that is if there were strong sectoral specializations of countries and some of them were taking extraordinary advantages in a form of high remunerations from their structural features.

Level and sources of wage inequality across EU countries in the period 2004-2013 measured by Theil index are presented in table 2.

Considering changes in a level of Theil index in time we can positively assess the European convergence in a dimension of remunerations' equalization. A statement about a success of European integration may be supported by the decreasing wage inequality across EU member states when comparing 2004 and 2013. Moreover, real convergence is reflected by declining tendency of Theil index value in the analysed period. However, a subperiod of economic crises negatively influenced the processes

Table 2. Wage inequality across EU countries in 2004-2013 – Theil index and its decomposition

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
Level of Theil index and its components										
IT1	0.2988	0.2857	0.2779	0.2602	0.2376	0.2479	0.2464	0.2444	0.2480	0.2443
IT1within	0.2128	0.1988	0.1892	0.1727	0.1531	0.1636	0.1623	0.1627	0.1662	0.1626
IT1between	0.0860	0.0868	0.0887	0.0875	0.0845	0.0843	0.0841	0.0817	0.0818	0.0817
Structure of Theil index										
IT1within	71.22%	69.60%	68.08%	66.36%	64.44%	66.00%	65.87%	66.58%	67.02%	66.57%
IT1between	28.78%	30.40%	31.92%	33.64%	35.56%	34.00%	34.13%	33.42%	32.98%	33.43%

*Calculated for 26 EU countries – without Poland.

Source: own calculation based on Eurostat data [www1; www2].

of integration. After 2008 the level of Theil index has been oscillating around 0.245 points and it is difficult to prove its decrease. Nevertheless, the decrease of 0.05 points of Theil index within 10 years is a great achievement of the integration and proves tendency to equalization of the European society's life level.

The decomposition of Theil index reveals that wage inequality across EU countries is mainly shaped by differences in the levels of socio-economic development of each member state. Within component of Theil index constitutes about 2/3 of the whole differentiation in remunerations. However, both its level and share were decreasing in time, especially till 2008. It may be a result of a strong effort of the catching-up countries, which try to limit the development gap by implementing new technology, improving their endogenic potential and adopting institutional solutions favourable for economic efficiency.

Moreover, the results of the disaggregation indicate that differences in a structure of the economy are responsible for about 1/3 of wage inequality. Although structural features appeared to be less important than general results of economies, the sectoral specialization also plays a role in equaling remuneration and thus a life-level across EU. Additionally, the importance of the structural component is growing, especially when we observe a dynamic growth of GDP. It means that inequality induced by structural features is decreasing slower than the general inequality level. Structural changes are a long-term process, which often takes place along with generation changes. It appears that transforming ways of organizing economic activities by adopting new solutions and improving the usage of production factors may be easier than changing longstanding sectoral relations. It also suggests that cohesion policy should take into account also structural aspects of employment and production and try to support the modernization processes.

4. Inequality in distribution of wages and salaries within economic sectors

As concluded above different patterns of structural development in EU countries are one of the sources of wage inequality. Thus, it is important to specify what branches are among the most diversified and what among the most equal concerning a level of remunerations. The most modern ones which focus on innovation and meet growing demand create chances for high payments for employees. However, participation of each country in modern trends may be limited by its poor endogenic potential or other constraints. In a result some countries may not be able to take advantage of progress, what can be reflected by high wage inequality in the most modern kind of activity. On the other hand, high wage inequality in traditional branches can reveal low mobility of workers in this sphere.

The level of wage inequality between EU countries in 10 branch aggregates is presented in table 3.

Table 3. Wage inequality across EU countries in 10 branch aggregates in 2004-2013 – Theil index

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*
A	0.3320	0.3125	0.2999	0.2808	0.2566	0.2546	0.2541	0.2619	0.2688	0.2538
B-E	0.2562	0.2412	0.2306	0.2097	0.1898	0.1995	0.1946	0.1968	0.1988	0.1892
F	0.2663	0.2444	0.2278	0.2109	0.1911	0.2071	0.2053	0.2046	0.2123	0.2133
G-I	0.2120	0.1972	0.1862	0.1670	0.1536	0.1631	0.1610	0.1626	0.1685	0.1599
J	0.1870	0.1724	0.1647	0.1492	0.1279	0.1313	0.1293	0.1274	0.1315	0.1217
K	0.1790	0.1648	0.1578	0.1486	0.1228	0.1401	0.1398	0.1369	0.1352	0.1356
L	0.2168	0.2186	0.2115	0.1879	0.1664	0.1766	0.1759	0.1771	0.1813	0.1938
M-N	0.1944	0.1810	0.1692	0.1493	0.1372	0.1498	0.1482	0.1497	0.1547	0.1563
O-Q	0.2029	0.1858	0.1791	0.1644	0.1447	0.1516	0.1511	0.1526	0.1560	0.1434
R-U	0.2062	0.1933	0.1821	0.1640	0.1517	0.1656	0.1674	0.1677	0.1736	0.1760

*Calculated for 26 EU countries – without Poland.

Source: own calculation based on Eurostat data [www1; www2].

The highest differences in remunerations could be found in agriculture (A) and construction (F). This pattern did not change in the analysed period, although both sections experienced a serious decrease in wage inequality between 2004 and 2013. Moreover, agriculture appeared to be a branch with the strongest tendency to equalize wages and salaries across EU.

In contrary, information and communication (J) and financial and insurance activities (K) are branches with the most similar level of remunerations across EU countries. These kinds of activity usually engage highly qualified employees and are based on ICT usage. These features could explain equalization of wages and salaries in EU as they enable transborder flow of services (as movement of a final product or

a production factor). Although the relative similarity of wages in these branches was typical in the whole period, the convergence of remunerations was quite strong in information and communication and at the average speed in financial and insurance activities resulting in conversing their position between 2004 and 2013.

The most limited reduction of wage inequality in the analysed period was observed in real estate activities (L). It could be influenced by its strong connection with relative immobile land resources. This section was placed among branches with an average level of wage inequality at the beginning of the analysed period, but it was changing its position into a group of the most unequal.

Generally, the most diversified level of wages and salaries is observed in traditional branches such as agriculture, industry and construction while the service sector is revealing a lower level of inequality across EU countries. To some extent real estate (L) and the other services (R-U) break this rule. Moreover, within the service sector the lowest level of wage inequality was typical for the most modern, dynamically developing branches, such as information and communication (J), finance and insurance activities (K) and professional services (M). This fact could be perceived as a positive tendency. This point of view suggests that the development of the knowledge-based economy may be connected with more equal life level. However, a problem of participation in this economy may shed a dark light on the perspective. Engagement of labour in the most modern branches requires a high level of their qualification and professional abilities. Thus, limitations to possibilities of investment in human capital may reduce the general chance for equaling remunerations in the EU society.

5. Conclusions

The results of the research allow to conclude that the role of structural features of the EU economies is essential in shaping wage inequality across the countries, but not prevailing . The most important appeared to be general differences in socio-economic development influenced by historical, institutional and other conditions differing endogenic potential of each member state. Nevertheless, structural pattern of development was responsible for about 1/3 of the differentiation.

The level of wage inequality across EU countries in the period 2004-2013 reveals a tendency to decline along with general convergence of the economies as well as with structural convergence of employment and production. It proves the successfulness of European integration, but it must be stressed that the crisis seriously limited the process of wages equalization.

A detailed analysis of wage inequality measured by Theil index calculated for 10 branch aggregates indicates that modern kinds of economic activity such as information and communication or financial and insurance services are characterized by the least level of wage inequality, while more traditional sectors such as agriculture, construction and industry constitute activity with the most unequal distribution of

wages and salaries across EU countries. It creates some optimistic perspectives of cohesion in the emerging knowledge-based economy, but at the same time puts up some concerns about a possibility of inclusion of people with a lower level of human capital and lower adaptability to the new conditions.

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