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## Article

# Chosen Aspects of Modernization Processes in EU Countries and in Poland - Classical Point of View

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**Edyta Dworak, Anna Malarska**

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## **Chosen Aspects of Modernization Processes in EU Countries and in Poland – Classical Point of View**

### **Abstract**

*The aim of this paper is an evaluation of changes in a sectoral structure of the employment in EU-countries in time. Against this background there are exposed changes in Polish economy in the period 1997-2008. There were used classical tools of the statistical analysis to illustrate and initially verification the theory of three sectors by A. Fisher, C. Clark i J. Fourastiè, orientated to the evaluation of the modernization process of EU-economies.*

### **1. Introduction**

Each economy may be characterized as a set of elements. The identification of these elements means describing its structure. An economic structure is therefore a set of elements of economy and relations among these elements (Nowa encyklopedia powszechna 1996, p. 80; M. Klamut 1996, p. 58; A. Łukaszewicz, A. Karpiński 2001, p. 451). This definition has a general character. It is worth noting that the precise describing the economic structure requires the identification of individual elements of the structure. It is so because the character of these elements determines the existence of various types of the structure. There are distinguished some types of the economic structure in the economic literature (E. Kwiatkowski 1980, p. 58):

- an institutional structure,
- a territorial structure,
- a production structure.

The institutional structure is a kind of the economic structure distinguished on the base of forms of a production factors ownership; it comprises a state sector, a private sector, a collective sector and a mixed sector. The territorial structure consists of economic regions. The production structure comprises various areas of the economic activity, for example: branches, sections and economic sectors (W. Jakóbiak 1997, p. 18).

It is worth pointing out that the economic structure comprising these three elements is called the structure of a *largo* sense (S. Marciniak 1970, p. 14). Such a structure makes a base to conduct complete research of the economy. It may be well to add that the research of the economic structure is restricted most often to its chosen elements, it means it is restricted to the analysis of the production or employment structure; these two types of a structure are called in the literature the structure of a *stricte* sense (E. Kwiatkowski 1980, p. 59).

An interesting background for the research of the economic structure in a sectoral dimension is the theory of three sectors by A. Fisher, C. Clark and J. Fourastié. These authors distinguish three sectors of the economic structure: (1) agriculture, (2) industry and (3) services. The main thesis of the theory is that changes of the economic structure occur according to some rules (W. Kwiatkowska 2009, p. 110).

A. Fisher claimed that the share of a agricultural sector in work and capital resources decreases and the share of services increases in the process of the economic development. However initially the share of an industrial sector increases in production factors resources, in later phases of the development the share of this sector decreases to the advantage of services (E. Kwiatkowski 1980, p. 91).

C. Clark studied long-term changes of employment structures in countries characterized by a differentiated GDP per capita. He came to the conclusion that "in the process of the development the number of employees in agriculture declines in relation to the number of employees in industry, and that one decreases in relation to the number of employees in services" (C. Clark 1957, at: E. Kwiatkowski 1980, p. 91). These trends are confirmed, in Clark's opinion, in underdeveloped and high-developed countries.

Similar conclusions in reference to changes of the economic structure formulated J. Fourastié. He divided the economic development into three phases: ante-industrial society, industrial society and postindustrial society. In the second one he distinguished three stages: a start (characterized by a quick increase in the employment in industry), an expansion (the maximal employment in industry), a complement (a decrease of the employment in agriculture to the advantage of services). In the postindustrial phase the

employment in services amounts to about 80% of labour work (D. Hübner, M. Lubiński 1986).

According to A. Fisher and C. Clark the main determinants of changes of the economic structure and the employment structure are changes of the consumption demand occurring in the economic development. They result from meeting of consumption needs which is shown by means of income elasticity ratios in particular phases of the economic development (W. Kwiatkowska 2000, p. 5). In the process of the development the ratio of the income elasticity for products of the agricultural sector declines most quickly which leads to the reduction of agriculture. As far as industry is concerned the tendencies of the demand development for products of this sector are quite different. In the first stage of the income increase the elasticity ratios increase. In higher stages the demand for these products appears to be satisfied. Consequently the production of industry decreases. While the demand for services and the income elasticity ratios tend to increase in all stages of the economic development. The increasing demand is an incentive to accelerate the development of this sector.

To recapitulate considerations about the three sectors theory some conclusions may be formulated:

1. the sectoral structure of the employment may be considered as a vital measure of the economic development;
2. the demand for products of agriculture and industry decreases and the demand for services increases in the process of the economic development, consequently the importance of the first and second sector declines whereas the importance of the third sector grows;
3. the centre of gravity of the economic activity is shifted from the first sector to the third sector;
4. changes of the economic structure result from the process of the economic development but they create the economic development also (there is an interaction).

The three sectors theory seems to be very useful to assess changes in the economic structure of countries. It evaluates the level of the economic development and lays much stress on a reallocation of labour work resources among sectors. However the theory is subordinated to a critical examination. So it is worth noting the theory is based on big aggregates (economic sectors). The use of common income elasticity ratios for all products of a given sector is not reliable. Moreover, for the economic development, there are important not only changes of shares of particular sectors but also changes inside these sectors which is not taken into account in this theory. Considering of the consumption demand only and ignoring of the investment demand makes also reservations.

## **2. The aim of research and algorithm of complex proceedings**

The aim of the paper is an analysis of differentiating of modernization processes of EU-economies in the years 1997-2008 presented from the point of view of changes of the employment structure in economic sectors (See K. Górka, 2000, p. 67)<sup>37</sup>. The background of this analysis is the theory of three sectors that lays much stress on the role of employment in changes of an economic structure towards its modernization.

A diagnostics and an evaluation of territorial changes in a sectoral structure of the employment in EU-countries in time are subordinated to the main aim of the paper. Against this background there are exposed changes in Polish structure of the employment.

At the first, initial stage of empiric analyses there are some classical techniques of the statistical analysis that support the main research. The aim of these techniques is an illustration, measurement and describing of tendencies of changes in a sectoral structure of the most important characteristics of the labour market in EU-countries and in Poland.

At the next main stage of the research in the next paper will be presented the application of methods and tools of the multidimensional comparative analysis (called taxonomic), then the application of the shift-share technique<sup>38</sup>.

## **3. Fact-finding – level, structure and dynamics of employment based on the source data**

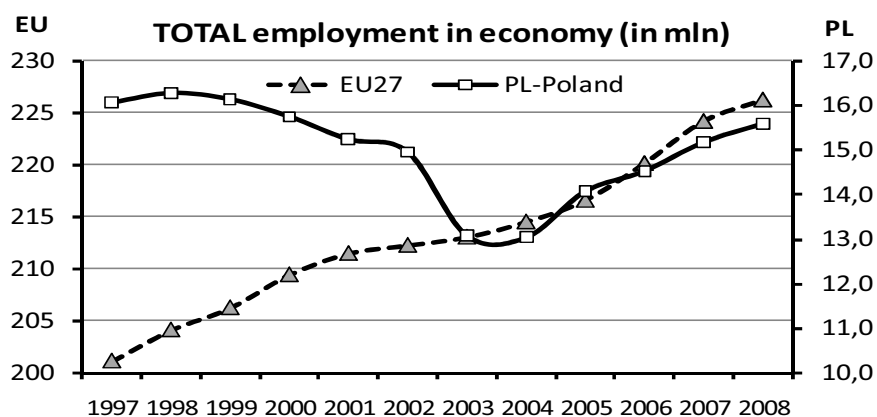
Data based on source materials referring to the employment in 27 EU-countries and in Poland in the years 1997–2008 point at the existence of divergence in tendencies of their changes – (see Fig. 1).

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<sup>37</sup>A sector should be treated as branches or a group of branches with a homogenous production.

<sup>38</sup> See: E. Dworak, A. Malarska, Differentiation of Modernization Processes in EU Countries and in Poland in Time and Space – non classical view [in:] Comparative vol. 12 no 3/2009

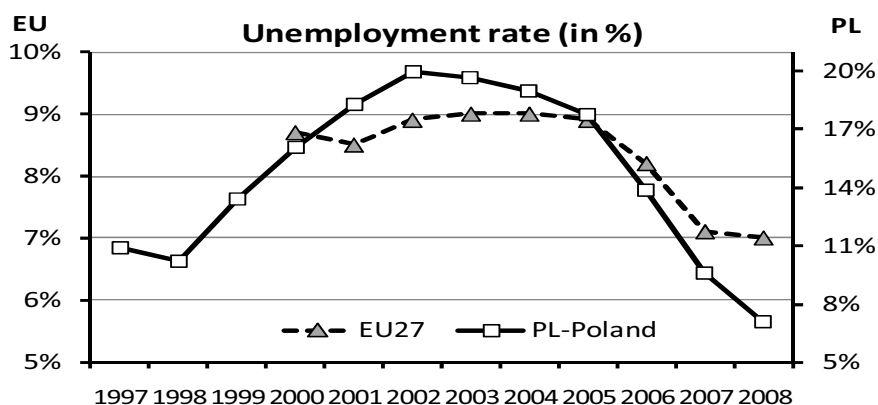
**Figure 1. The level of the employment (in mln) in 27 countries and in Poland in the years 1997–2008**



Source: Own study based on <http://epp.eurostat.ec.europa.eu>.

There is an opposite direction of the illustrated tendency of changes for Poland in comparison with EU-countries before Poland's accession to the EU. After the short-term stability (years 2003 and 2004), since 2004 there is a clear correction of a trend in Poland and its transformation into an opposite, coherent with an EU-direction. It happens so because of strong perturbations, that took place in Polish labour market, and because of variable tendencies in changes of the employment in time – (see Fig.2).

**Figure 2. The employment rate in 27 EU-countries and in Poland in the years 1997–2008**



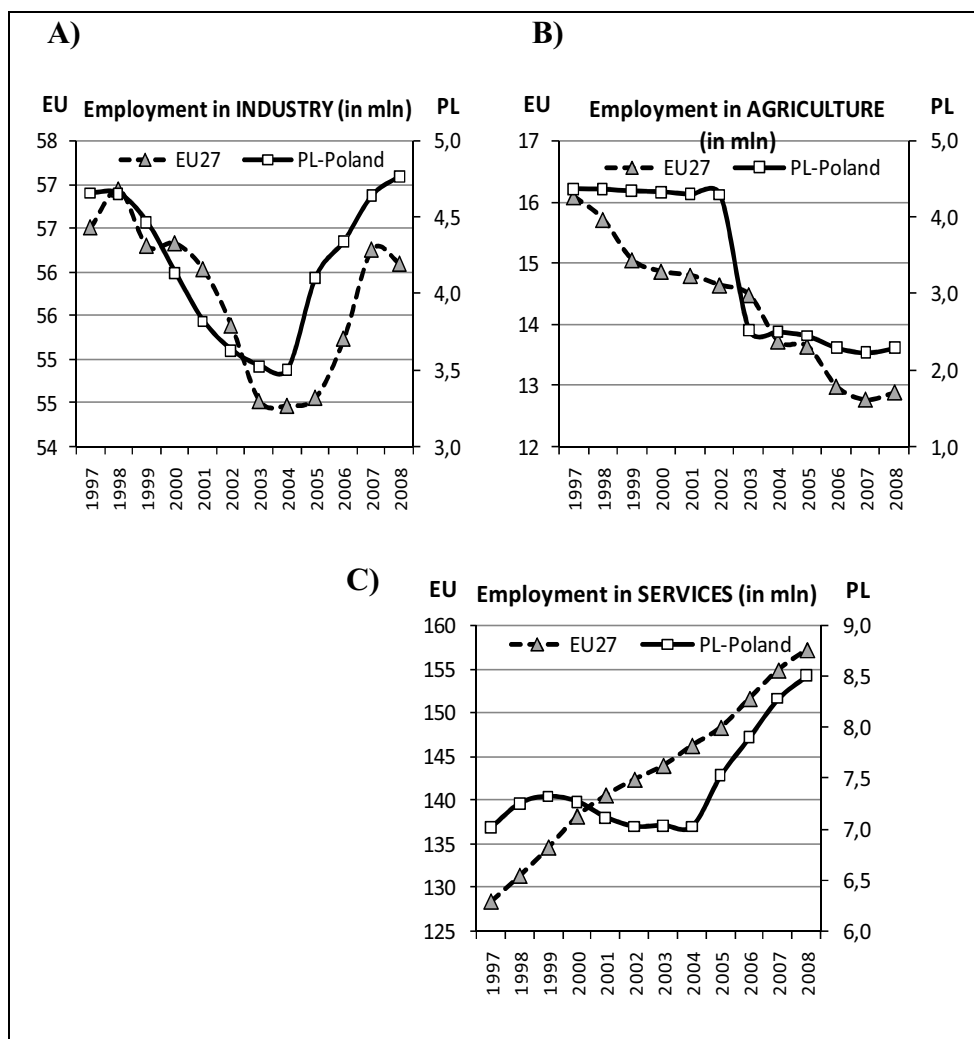
Source: Own study based on <http://epp.eurostat.ec.europa.eu>.

Tendencies of the employment level and the employment rate became convergent after Poland's accession to the EU.

In this context there appears a question referring to adjustment processes of Polish labour market to EU-markets in the formulation of the sectoral employment structure. There is a partly answer to this question in tendencies of changes in time of the employment rates (in %) according to the three-sectoral division of 27 economies of EU and Poland. To illustrate better this question there were transformed data based on source into absolute values of the employment with the maintenance of the total comparability of the compared economies division.

Consequently in the industry sector there are diametrically different directions of changes in indices of the employees share in Poland and in EU-countries. The increasing trend in Poland is accompanied by the declining tendency in EU-countries – see Fig.3.A).

**Figure 3. The level of employment (in mln) in industry, agriculture and services in 27 EU-countries and in Poland in the period 1997–2008<sup>39</sup>**



Source: Own study based on EUROSTAT data.

<sup>39</sup> The attentive reader notices easily two Y-axes of each presented graph (Fig.3 – Fig.5): the main (left)-for EU-countries and the auxiliary (right) –for Poland. The purpose of the application of a various scaling of these axes is the presenting of differences in tendencies of the phenomenon changes, and not in the levels. This aspect of differences, though visually difficult, is readable. – Fig.3 – Fig.9 are the authors' paper on the base of the Eurostat data.



However tendencies of changes of the employees number in industry in both subjects are convergent. After the decline stage (years 1997-2004) the employment increases but it does not reach the level from the initial year (1997) in EU-countries and it is lower in 2008 (decrease by 0,7%). At the same time it exceeds this level slightly in Poland (by 2,4%).

In agriculture the year 2003 is a turning point of differences in tendencies of changes of the employment share index in Poland and in EU-countries. Just since that year there is a clear convergence in compared economies –see Fig. 3.B).

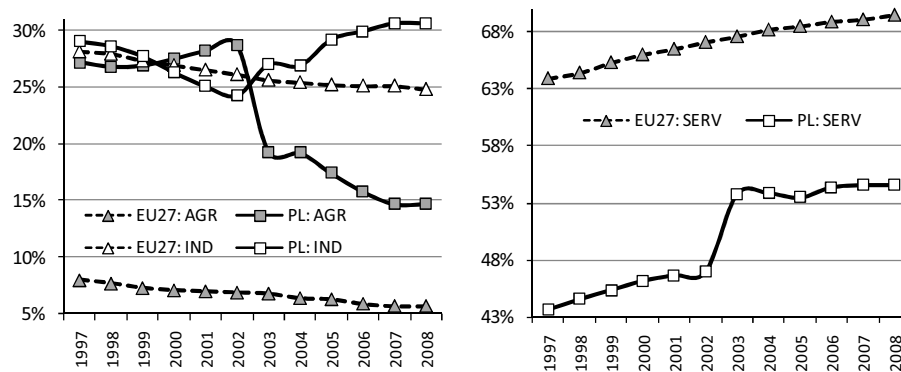
The difference in tendencies of changes of the share index is followed by levels of the employment in the agricultural sector in time in Poland and in EU-countries.

The systematic decreasing trend of the employment level in agriculture in EU-countries is observed since 1997 and ends in its considerable decline in the final year of the analysis (by 19,9%). However, the decrease of the employment level in agriculture in Poland in years 1997 – 2008 is deeper (as many as 47,6%), and it is the effect of one-time change of the phenomenon at the end of 2002 and the beginning of 2003 (by 41,2%).

The regularities of the employment share and level index in services are generally convergent, though with small deviations, in time in compared subjects. Both characteristics show a clear increase tendency in Poland and in EU-countries- see Fig. 3.C).

The considerable employment increase in services in EU-countries (by 22,3%) and in Poland (by 21,2%) is characteristic and similar in a relative scale in the analyzed period. A medium-yearly rate of the employment increase in this sector in EU-countries is a bit higher than in Poland (1,85% against 1,76%), however this appropriate, clearly intensified, increasing trend in Poland refers to the period 2004-2008, with a medium-yearly rate of increase amounting to 4,89% (against 1,82% in EU).

**Figure 4. The employees share in 27 EU-countries and in Poland according to the three-sectoral division of the economy in the years 1997-2008**



Source: Own study based on EUROSTAT data.

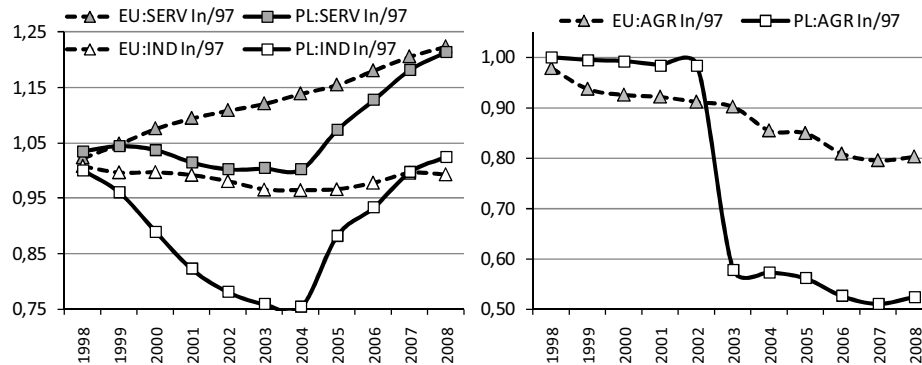
In the commentary summing up this introductory stage of the analysis is necessary to lay much stress on clear advantageous tendencies of changes in Poland leading to its modernization. The employees share in Poland decreases in agriculture and increases in services, at the same time the employment share in industry increases. (see Fig. 4).

On the base of the analysis of tendencies of these basic statistical measures in time it may be stated that the picture of Poland is quite different than the expected one. In the formula of indices the distance between Poland and the EU, according to the three-sectoral division, remains still significant. Nevertheless it is worth noting that there are positive changes of the hitherto trends in Poland towards its systematic modernization (see Fig. 6).

Other, simple measures proving differences in rates of changes of analyzed regularities in the EU and in Poland are classical, one-basic dynamics indices according to distinguished sectors of the economy.

It is vital to choose the base of reference. Recognizing the first year of the analysis (1997) as a base complicates the picture of changes and the explicitness of conclusions (see Fig.5).

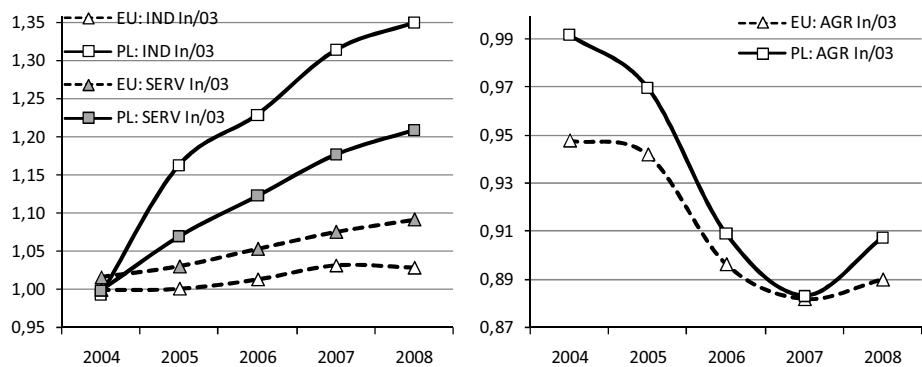
**Figure 5. One-basic indices of the employment dynamics in 27 EU-countries and in Poland according to the three-sectoral division of the economy in the years 1997-2008**



Source: Own study based on EUROSTAT data.

However the visualization of indices of the employment dynamics in a short term, with the reference base to the year 2003, may be clearly interpreted (see Fig. 6).

**Figure 6. One-basic indices of the employment dynamics in 27 EU-countries and in Poland according to the three-sectoral division of the economy in the years 2004-2008**



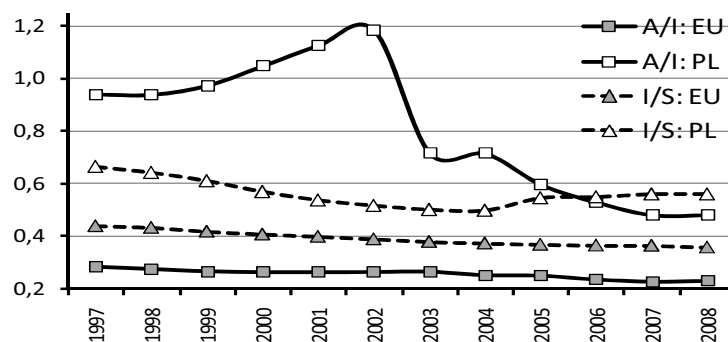
Source: Own study based on EUROSTAT data.

The regularities illustrated in Fig. 6 confirm fully the advantageous for Poland convergence of tendencies of changes, occurring in the sectoral employment in Poland and in EU-countries. They point at significant differences in rates of changes (more advantageous for services in Poland: medium-yearly 4,9% in comparison to 1,8%); consequently they show the need

of a further intensification of the modernization process of Polish economy orientated to shifts among sectors. It seems that the excessive, in comparison to the EU, medium-yearly rate of the employment increase in Polish industry (in Poland- 7,9% in comparison to 0,7% in the EU ) does not result from shifts among sectors. It is an effect of an excessive absorption of free work resources, mainly from the unemployment, that reflects optimistic expectations of entrepreneurs and good perspectives of the improvement of economic conditions owing to the European economic integration.

To sum up this part of considerations the theory of C. Clark should be verified. It must be stated that the theory is confirmed in all EU-countries totally, but it is not confirmed for Poland. This reservation refers to periodically anisotropic relations of the employees number in Polish industry and services that are a result of indifferently dynamic tendencies of changes in the employment level in these sectors in particular sub periods (compare Fig. 7 to Fig. 3.A, Fig. 3.B, Fig. 3.C).

**Figure 7. Quotients measures of the employees number in agriculture and industry (A/I), in industry and services (I/S) in 27 EU-countries and in Poland in the years 1997-2008**

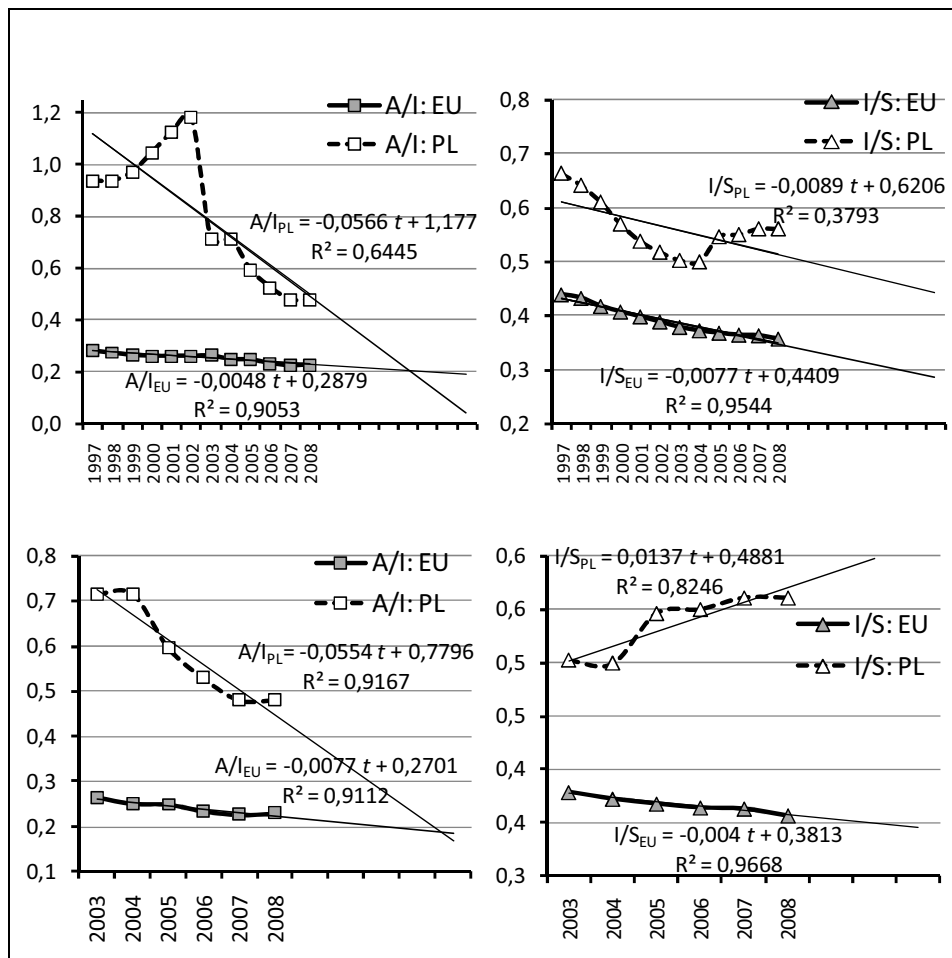


Source: Own study based on EUROSTAT data

Since 2004 the increasing tendency of the employment is noted in Polish industry, instead of the decreasing one (a medium-yearly increase by 7,9%). It makes up excessively for the hitherto decline (medium-yearly by 7,9%). The employment in services increased at the same time in both sub periods; the rate of increase was intensified in the years 2004-2008 (from the level 0,04% to 4,9%). As it is seen, the employment increase in services appeared to weak, in comparison to the increase in the employment in industry, so the discussed quotient sectoral measure could not confirm clearly the changes of Polish economy towards its complex modernization.

If it is assumed that EU-regularities are a direction of changes in Polish economy then it appears it is not possible in each case, particularly if tendencies of quotient measures changes of the modernization of Polish economy do not change both in a short and in a long term. The figures below confirm this thesis.

**Figure 8. Tendencies of quotient measures changes of the modernization of 27 EU-countries and Poland in the period 1997 – 2008 and 2003 – 2008**



Source: Own study based on EUROSTAT data.

The increasing trend of the employees quotient in industry and services, noted in Poland since 2003, appears distressing.

It seems that the presented analysis of changes tendencies in the sectoral employment structure indicates its significant changes against EU-countries

with much stress on adjustment processes of Polish economy and its modernization. But if only the values of employees quotients considered in pairs of sectors: agriculture and industry, industry and services, are simple measures of the modernization process, then the evaluation of changes in the employment structure is not explicit and not advantageous in all aspects.

#### **4. Conclusion**

Tendencies of the employment changes in EU-countries and in Poland in the period 1997-2008 are increasing. The sectoral division of the employment reveals however the difference of modernization processes in EU-economies and between Polish economy and EU-economies analyzed together. Consequently the attempt of typology of EU-countries into homogenous classes, on the base of similar quotient modernization measures, in chosen years of the analysis lost because of the complexity of modernization process.

However the research revealed that Poland's accession to the EU stimulated animators of Polish social-economic life to implement and intensify the adjustment processes. The consequence of this accession is the incoherence of changes in Polish and EU-labour markets and the natural disclosure of two stages of the sectoral employment structures in Poland with a turning point in 2003. Just in the second sub period (2004-2008), before and after the accession, the most numerical characteristics of the employment in Poland became similar to EU-tendencies but not all relative characteristics (shares expressed in percentage). The research showed the opposite direction of changes tendencies of the employees share in Polish and EU-industry just after Poland's accession.

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