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CORRELATION BETWEEN INCOME STRATIFICATION AND LEVEL OF EDUCATION – EMPIRICAL STUDIES IN POLAND



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Єж Р. Співвідношення між розподілом доходу та рівнем освіти – емпіричні дослідження в Польщі.

Аналіз емпіричного матеріалу та літератури показує, що освітня система, особливо рівень освіти, відіграє вирішальну роль у сучасному світі. У значній мірі це також визначає ситуацію на ринку праці та визначає рівень та розподіл заробітної плати. Як показують дослідження, проведені в роботі, розмір зарплати та розподілу заробітної плати сильно корелює з рівнем освіти. Структурні зміни, що відбуваються в польській економіці, особливо модернізація економіки, технічні досягнення та значне збільшення кількості респондентів призвели до значного підвищення диференціації заробітної плати.

Ключові слова: освіта, кореляція, стратифікація доходів, рівень заробітної плати

Єж Р. Соотношение между распределением дохода и уровнем образования – эмпирические исследования в Польше.

Анализ эмпирического материала и литературы показывает, что образовательная система, особенно уровень образования, играет решающую роль в современном мире. В значительной степени это также определяет ситуацию на рынке труда и определяет уровень и распределение заработной платы. Как показывают исследования, проведенные в работе, размер зарплаты и распределения заработной платы сильно коррелирует с уровнем образования. Структурные изменения, происходящие в польской экономике, особенно модернизация экономики, технические достижения и значительное увеличение количества респондентов привели к значительному повышению дифференциации заработной платы.

Ключевые слова: образование, корреляция, стратификация доходов, уровень заработной платы

Jeż R. Correlation between income stratification and level of education – empirical studies in Poland.

An analysis of empirical material as well as the literature shows that the educational system, especially the level of education, plays a decisive role in the modern world. To a large extent, it also determines the labour market situation and decides on the level and distribution of wages. As it is shown by the studies conducted in the paper, the size of salary and wage distribution strongly correlates with the level of education. The structural changes occurring in the Polish economy, especially the modernization of the economy, technological advances and a significant increase in enrolment ratio led to a significant increase in wage differentiation.

Keywords: education, correlation, income stratification, wage levels

Stratification of income is derived from a number of processes taking place in the economy. Most often it occurs in the structural mismatch between the economy to new challenges and changing reality. Structural changes and changes in processes in the economy mean that the determining factor of the remuneration's level becomes education, interpersonal skills, and the ability of the employee to acquire new skills. Wages strongly correlates with the level of education. As a result of the processes of economy's modernization, there was a large above-average wage growth of skilled people, which resulted in a large increase of wage inequality in many countries in economic transition.

This paper presents results of studies on changes in the structure and distribution of income (wages) in Poland in 1996-2014. A hypothesis has been presented in the study of technological development that promotes highly qualified employees (called Skill-Biased Technical Change) determines increasingly the unequal distribution of wages in Poland. In order to verify this hypothesis, econometric studies were used, taking into account the determinants of changes in wages on the basis of data from LFS and OCR.

The main part

For Examining the impact of the education's level on the level of wages and their diversity it is worth to refer to the analysis of structural changes taking place in Poland. The socio-economic transformation, including the commercialization of the Polish economy, has led to changes in the structure of employment in line with the Clark-Fisher assumptions. As a result of these changes, a transition from the agricultural sector (sector I), and from the industrial sector (sector II) to the third services sector has occurred. These changes have led to significant technological progress and earnings stratification of society. The impact of technological progress on the development of wage levels in Poland confirmed the hypothesis proposed in the introduction [1]. The statistical data show the growing importance of inequality between the groups with higher education level and major occupational groups in the general ratio of wage inequality. In the analysis of the uneven distribution of wages the Gini coefficient and Theil index were used [3]. According to the proposed research methodology there has been conducted econometric estimation of parameters, in which the

dependent variables were, successively: wages, the probability of finding employment in the last year and the likelihood of jobs' loss in the last year. Wage regressions were estimated according to information derived from databases (the October Compensation Research) from the years 1996-2004, which is available every two years. On the basis of the differences between the coefficients for each year were specified changes in time of strength (flexibility), with which the independent variables affect the dependent variables in the period considered. When a variable turned out to be not statistically significant, in case of the linear model (characteristic of the wage) the coefficients are assigned the value "0", and the logit models indicated odds ratio value equal to "1". The results of the analysis confirm that the level of education and the employees' occupational status significantly influenced, in the researched period, the differentiation in the level of wages in Poland. The return on education expressed as the percentage increase in wages resulting from each additional year of education increased for most occupational groups surveyed in 1996-2014. Significant wage benefits associated with the period of study are gained by employees performing work requiring the greatest skills: managers (8% above the expected wage increase for each year of education) and specialists and technicians. For these professional groups is also the largest growth dynamics of the return on education (about 35% over the period).

An important aspect of the conducted analysis is that education is becoming an increasingly important quantity for industrial workers and craftsmen (an increase in the return on education by 22%). Similar results are achieved by machinery and equipment operators (17%), and office workers (an increase of 33%). Growing importance of education and educational level were not observed among workers of the third sector of the economy namely the service sector. Socio-economic studies show a significant impact of educational level on living standards, and the results of empirical studies support the use of the SBTC theory. The return on education grows at the fastest rate for professional groups, of whose qualifications the society makes the greatest use, and whose qualifications are becoming increasingly useful with the progress of technology (professionals, technicians, but also office workers and certain groups of manual workers). This progress is not important to employees who do not use new technologies in their work or who are easily substituted by such technologies (retail workers, service to the public or persons performing simple work). The increasing diversity of expected wage simultaneously linked to the level of education and a profession performed by an employee may be noted. In 1996, the wage differential resulting from the combination of these characteristics was approximately 219% (i.e. that the salary of a manager with a university degree was more than 2 times higher than the wage of those with primary education). In

2014, this differential was already 256%. The highest wages were reserved for managers with higher education, and lowest for those with primary education working in retailing and services for the public. Moreover, the overall measure of wage differentiation determined by education and profession of an employee increases (the ratio of standard deviation from the average expected wage). In 1996 the ratio was 18%, and in 2014 already 33%. It is also worth pointing that the wage differential increases faster in the "professional and educational" groups achieving above-average wages. This is consistent with the classification and the income structure of society. This wealth class is characterised by the biggest increase in the return on education for professions requiring higher qualifications and using services such as recreation, tourism and transport.

Another element of the study was the estimates of parameters in which the dependent variables were the probability of finding a job or the loss of a job, i.e.:

- data on jobs (working for less than 1 year and the likelihood of finding a job);
- a person with certain personal qualities and working previously resigned from a job or lost it before the study took place, then is determined by the probability of a job loss or the destruction of employment.

The results of the conducted study indicate that in case of an analysis showing the dependence between qualifications and job destruction, the absolute values of coefficients obtained by the chance quotients should not be taken into account, but only their movements over time. The reason for this is that the dependent variables embrace not only the process of creation and destruction of jobs, but also the turnover of staff, which is higher for less educated people. This shows that jobs reserved for persons performing manual jobs were taken faster than those for the persons with higher education in the last year. This results in the fact that the probability of a job loss for the workers is much higher. For the estimation of logit models and because of the difficulty of interpretation the multiple variables were not used. The results confirm the hypothesis about the important role of technological changes. These changes result in the increase of relative demand for better-educated people, which affected the situation on the Polish labour market in recent years (fig. 1-2). On the other hand, it seems that this effect is manifested most strongly at a time when there was a downturn on the labour market. At a time when the situation on the labour market deteriorated (1997-2006) and simultaneously a positive impact of the educational level on wage levels was increasing (fig. 1), the positive impact of education on the probability of finding a job was also growing (every year of study reduced the chances of losing work to a greater extent) (fig. 2). However, when the labour market situation started to improve (since 2003), the relative chances of the employment began to be increasingly less dependent on education.

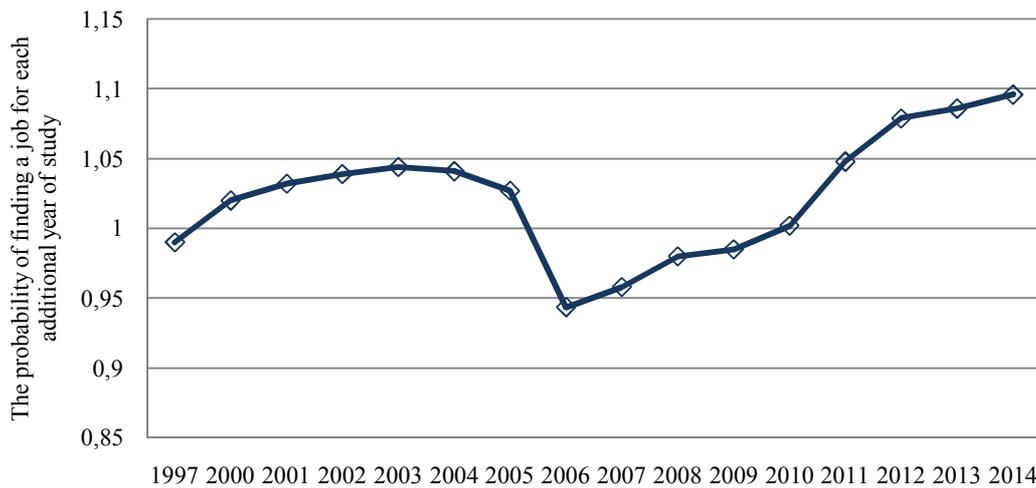


Fig. 1. Influence of education and each additional year of education on the probability of finding a job in the years 1997-2014

Source: Labour Force Survey in 1998-2014. GUS, Warsaw 2014

Similar results were obtained by analyzing the change over time in the relative chances of finding and losing a job for people with different levels of education. In figure 2, for the reasons described above, the coefficients of the different levels of

education have been indexed (1997 = 1), so that we only see their changes over time, rather than absolute values. The reference point for all analyses was the core group of people with higher education.

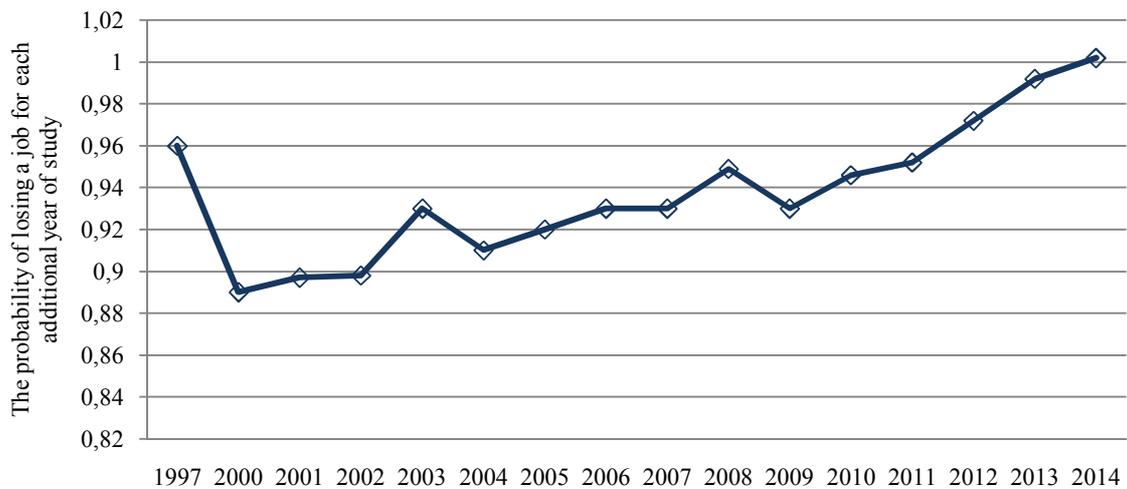


Fig. 2. Influence of education and each additional year of education on the probability of losing a job in 1997-2014

Source: Labour Force Survey in 1998-2014, GUS, Warsaw 2014

The relative chances of finding employment for less educated groups were lower than in the start-up period for most of the researched period. The deepest relative deterioration on the labour market in this aspect experienced people without targeted qualifications, whether with primary or secondary general education. With the improvement of labour market conditions, the relative chances of the employment of these groups were also increased.

We deal with a contrary situation in case of changes in the relative opportunities of employment

loss. These chances have increased for all groups (i.e., their situation has worsened compared to those with higher education) only in the initial period – when the general situation on the labour market deteriorated the most. Throughout the research period (due to the availability of data covering the period 1996-2014) the expected relative wages of highly educated people and of senior jobs increased. As shown by preliminary analysis of the distribution of wages in Poland, the significance the educational level for the distribution of wages also grew in later years – until 2006 [1].

This increase coincided with the cyclical phenomena of this period and further worsened the situation of less educated people in the early years of the period. Furthermore, people with low qualifications did not only experience a relative decline in wages, but their situation on the labour market also significantly worsened in this period. The situation of these people improved in the next period – from 2003, which may be the result of two parallel processes. On the one

hand, the overall situation in the economy improved and the demand for simpler work performed by less qualified people increased. This was due to a deepening of the migration phenomenon in Polish society. On the other hand, changes in relative wages that occurred in 1997-2002, could have turned out to be sufficient to improve the relative employment situation of such persons.

Abstract

The conducted empirical studies as well as the literature allowed us to verify the hypothesis concerning the possible mechanisms of wages disparity in Poland.

The distribution of wages and the employment structure show that during the research period demand for highly skilled workers increased strongly. In the total employment the share of occupational groups requiring at least secondary education, vocational training or higher education rose, so there was a high demand for skilled workers, professionals, technicians and managers. The correlation of average salaries, depending on education and performed occupation changed clearly. The significant increase in educational level for the received remuneration is also shown by the results of the decomposition rate of wage inequality (the Gini index and Theil index) on the inequality within and among the groups. On the basis of WSP the share of intergroup inequalities between different levels of education in the general level of wage inequality nearly doubled (from 12% to 22%) also the share of inequality among occupational groups significantly increased (from 19% to 36%). It seems noteworthy that in groups with higher educational levels and professions requiring higher qualifications the inter-group wage differentiation rises. The results also show a marked increase in the return on education. The return on education, namely the percentage increase in wages resulting from each year of education, is the largest for highly skilled groups, but also for those groups the most dynamic growth can be observed.

Список літератури:

1. A. Skórska, R. Jeż Polski rynek pracy wobec tworzenia podstaw gospodarki wiedzy // W: *Innowacyjność w budowaniu gospodarki wiedzy w Polsce* / red. nauk. Ewa Okoń-Horodyńska, Sylwia Pangszy-Kania. – Warszawa: Instytut Wiedzy i Innowacji, 2007. – S. 48-59.
2. R. Jeż Nierówności dochodowe – syntetyczne wskaźniki oraz poziom nierównomiernego rozkładu dochodów w Polsce. In: A. Organiściak-Krzykowska (red. nauk.) *Regionalne rynki pracy*, IPiSS, UWM w Olsztynie, Warszawa-Olsztyn 2011, pp. 215-218; Also see: M.P. Keane, E.S Prasad: *Changes In the structure of Earnings during the Polish transition*. *Journal of Development Economic* 2006. – S. 80 (2).

References:

1. Skórska, A., Jeż, R. (2007). *Polski rynek pracy wobec tworzenia podstaw gospodarki wiedzy* [The Polish labor market to create the basics of the knowledge economy]. Warszawa: Instytut Wiedzy i Innowacji [in Polish].
2. Jeż R. (2006). *Nierówności dochodowe – syntetyczne wskaźniki oraz poziom nierównomiernego rozkładu dochodów w Polsce* [Inequalities in income - synthetic indicators and the level of unequal distribution of income in Poland]. *Journal of Development Economic*, 215-218 [in Polish].

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