

SUMMARY

The dynamic development of new technologies encourages us to examine its impact on the economy. The fourth industrial revolution, initiated in the 21st century, contributes to fundamental changes in the business model of various branches of the economy, which is also important for the labour market. The aim of this thesis is to assess the impact of new technologies on labour market flexibility. A flexible labour market can adapt to changing economic conditions in order to keep a high employment and reduce unemployment.

The main hypothesis stresses that the development of new technologies has an impact on labour market flexibility in cross-section and time-series data. The analysis was conducted for the European Union member states, with special emphasis on the EU-15 group (member states before 2004), and for Poland using data from 2007 to 2016 published by OECD, World Bank and Eurostat in particular.

Labour market flexibility was measured using the TOPSIS method (Technique for Order of Preference by Similarity to Ideal Solution). The synthetic indicator of labour market flexibility was calculated using 7 variables: tax wedge, trade union density, unemployment rate, temporary employment, part-time employment rate, employment rate by age group 15-24, employment rate by age group 55-64. The research allowed a comparison of the economies based on a 10-year time series. The Netherlands was considered to be the country with the highest labour market flexibility, while Belgium scored the lowest. Furthermore, all the countries were classified into 4 types according to the level of labour market flexibility. In class 1, with high labour market flexibility, there was one country, the Netherlands. In class 2, with average labour market flexibility, there were 8 countries: Great Britain, Germany, Ireland, Denmark, Poland, Sweden, Austria and Portugal. In class 3, with below-average labour market flexibility, there were 5 countries: France, Spain, Finland, Luxembourg and Italy. In group 4, with low labour market flexibility, there were 2 countries: Greece and Belgium. Poland was classified as having average labour market flexibility and confirmed a high rate of growth in the analysed time-period.

The paper proposes an original method of assessing the impact of new technologies on labour market flexibility, by combining the TOPSIS method with panel data analysis. The research showed that among many variables, the increase in household access to the Internet results in an increase of the synthetic index of labour

market flexibility two years later, all other things being equal. The dependent variable was the synthetic indicator of labour market flexibility. The independent variables were 6 selected indicators of new technologies: household access to the Internet, high-technology exports, employment in high- and medium-high technology manufacturing sectors and knowledge-intensive service sectors, researchers in R&D, GERD (*Gross Domestic Expenditure on Research and Development Activity*) and the number of patents in the ICT sector.

The further studies allows us to determine that the variables of new technologies can increase and decrease the variables of labour market flexibility. The positive impact was noted especially for the employment rate of older employees. The increase in household access to the Internet, high-technology exports and GERD lead to an increase in employment rate by age group 55-64. The negative impact was observed for the employment among younger employees in particular. The decline in employment rate by age group 15-24 can be explained by the fact that development in the area of new technologies leads to the automation of work and elimination of jobs based on simple, repetitive tasks. This leads to rising unemployment, notably among young people who do not have qualifications which are not affected by work automation.

The research presented in this paper allowed for a positive verification of the main hypothesis stating that the development of new technologies has an impact on labour market flexibility in cross-section and time-series data.

The paper concludes that household access to the Internet contributes significantly to the increase of synthetic indicator of labour market flexibility. Therefore, this can inspire to install high-speed connections both in urban and rural areas, especially where the unemployment rate is high. Moreover, the positive impact of new technologies on the increase in employment of older people, confirmed by the research, may provide inspiration to intensify activities in this area, not only through increased access to IT infrastructure, but also by appropriate adjustment of vocational education geared to the needs of the labour market. Finally, new technologies have both a positive and negative impact on labour market flexibility, and therefore it is necessary to monitor these relationships.