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The impact of higher education on employment in the labour market: Lithuanian case

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Abstract

This study aims to investigate the employment of higher education graduates in Lithuanian labour market between 2005 and 2014. Today, this problem is relevant to Lithuania, as level of high school graduates employment is changing yearly. The purpose of the research is to evaluate the impact of higher education on employment in Lithuanian labour market. Seeking to define the impact of higher education on employment in Lithuanian labour market, analysis and synthesis of scientific literature about the influence of education on the labour market; systematic statistical data analysis of Lithuanian education and employment and unemployment rate are presented. Results of correlation analysis indicate that educational attainment has influence on employment and unemployment level in Lithuanian labour market and relationship between higher education and employment, unemployment and real labour productivity are dominated in all the EU-28 countries compared to Lithuanian labour market.

Keywords: Education, higher education, employment, unemployment, labour productivity.

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1. Introduction

Education plays a key role in sustainable development. Today, in the period of dynamic technological development, the need for new information and knowledge has become more essential condition for human resources evolution. In recent decades, the level of education of the population in all developed countries increased. Rapid expansion of higher education across many countries had important effects on labour market.

The impact of higher education on labour market has been the subject of much study. Many studies suggest the role of education for successful entry into the labour market. A major benefit of education is the lower risk of unemployment at higher educational levels (Mincer, 1991). In explaining the lesser conditional unemployment of educated workers and the somewhat shorter duration of their unemployment, Mincer (1991) indicated these reasons: costs on-the-job search for new employment relative to costs of searching while unemployed are lower for more educated workers; these workers are also more efficient in acquiring and processing job search information and firms and workers search more intensively to fill more skilled vacancies. Educational workers enjoy at least three basic advantages over less-educated workers in the labour market: higher wages, greater upward mobility in income and occupation and greater employment stability (Mincer, 1991).

The opinion prevails that education is not the only resource of workers in job search: work experience, past employment history, networks and contacts or geographical mobility might all be related to individual's labour market success (Gangl, 2000). Gangl (2000) has proposed a systematic focus on analysing the role of education in the transition from education to work. According his opinion, most of these factors like work experience, employment history or professional contacts are very limited only among those entering the labour force almost by definition, and labour market allocation depends on factors other than educational qualifications. He researched the relationship between educational qualifications and unemployment risks of market entrants. This is important for the examination of the impact of higher education on employment in the labour market. Therefore, education provides both productive capacities to individuals and attained qualifications which are a main asset in worker competition for jobs available on the labour market.

The discussion on the relationship between education and employment is prevailing in economic literature (Bernardi, 2003; Beller & Hout, 2006; Breen, 2005). Research studies show that education has substantial impact on labour market outcomes such as earnings and employment (Herman, 2012; Ionescu, 2012; Riddell & Song, 2011). Riddell and Song (2011) analyse the impact of education on unemployment incidence and re-employment success from labour market. They investigate the causal effects of education on individual's transitions between employment and unemployment with particular focus on the extent to which education improves re-employment outcomes among unemployed workers.

According to the human capital theory, higher qualifications increase the productivity of work. Thus, individuals with a higher level of education and higher qualifications have a better chance of being employed (Zella, 2010). Researchers have accented the determinant significance of education in the economic and social development of a country (Barro & Lee, 2013). An abundance of well-educated people goes along with a high level of labour productivity. The level and distribution of educational attainment also influence social outcomes and income distribution (Brejerova & Duflo, 2004; Cutler, Deaton & Lleras-Muney, 2006).

The hypothesis that human capital is a key indicator of productivity is widely discussed in economic literature in Lithuania (Ciburiene, 2014; Giziene & Simanaviciene, 2014). They proposed the assessment of relation between labour market and education system in Lithuania. Lithuanian scholars have examined changes in the labour market and their trends, the significance of human resources to Lithuanian economic development and problems concerning wages, labour regulations and other issues that impact on employment and labour market policy (Grazulis & Gruzevskis, 2009). However, studies have focused on the lack of higher education impact on employment, unemployment and

productivity in Lithuanian labour market. Today, this problem is relevant to Lithuania, as high school graduates employment in the labour market have influence on the country's economic situation. At the same time, research studies investigating such changes in recent period are missing. For this reason, actual problem arises to analyse the impact of higher education on employment in the labour market.

The purpose of this paper is to evaluate the impact of higher education on employment in Lithuanian labour market.

The research has been organised as follows: it first presents introduction about relevance of problem, short literature review about the impact of education on the labour market, purpose of this paper. The next section describes the methodology for examining the impact of higher education on employment in the labour market (methods of systematic statistical data analysis of Lithuanian education and employment rate and unemployment rate; correlation analysis determining relationships between higher education and employment, unemployment and labour productivity in the EU countries). Results part outline that educational attainment has influence on employment and unemployment level in Lithuanian labour market and relationship between higher education and employment, unemployment and real labour productivity are dominated in all the EU-28 countries. The paper ends with conclusions.

2. Methodology

In order to examine the impact of higher education on employment in Lithuanian labour market, two approaches are adopted. At first, we are analysing changes of employment and unemployment rate in relation to the level of education in Lithuania. Secondly, we are examining the relationship between the share of population with tertiary education in total population in the EU-28 and employment rate, real labour productivity per hour worked and unemployment rate. This paper uses the systematic statistical data analysis of the employment and unemployment rate related to the level of education for the period between 2005 and 2014 in Lithuania. Data source used to describe access to education and real labour productivity, employment and unemployment rate is Eurostat database. The education level was determined by the International Standard Classification of Education (ISCED, 2011) and based on three training levels: less than primary, primary and lower secondary education (levels 0–2); upper secondary and post-secondary non-tertiary education (levels 3–4) and tertiary education (levels 5–8).

In order to check the relationship between the share of population with tertiary education in total population aged 15–64 in the EU-28 and employment rate, real labour productivity per hour worked and unemployment rate during the period 2005–2014, the correlation analysis will be done. Pearson correlation coefficient will be calculated by the formula:

$$r_{xy} = \frac{\sum (X - \overline{X})\left(Y - \overline{Y}\right)}{\sqrt{\sum (X - \overline{X})^2}\sqrt{\sum \left(Y - \overline{Y}\right)^2}} \quad (1)$$

Where *X* and *Y* are indicators, for which correlation must be define; $\overline{X}$ and $\overline{Y}$ are the means of *X* and *Y*; *rxy* is correlation coefficient between *X* and *Y*.

Pearson correlation coefficient is a measure of the strength of the linear relationship between two variables and can get the values from −1 to 1. If correlation coefficient is close to $|\pm 1|$, it means that strong linear relationship between variables exists and if correlation coefficient is close to $|\pm 0|$, it means that linear relationship between variables does not exist, but non-linear relationship between them is possible.

In order to test the significance of linear relationship between variables, the following hypothesis will be tested: H_0: $rxy = 0$, H_1: $rxy \neq 0$. The hypothesis will be tested by calculating Student (*t*) statistics

and the probability for Student's *t*-distribution. The calculated probability is compared with the significance level that is chosen 0.05. It indicates a 5% risk that null hypothesis will be rejected when it is correct.

The significance of Pearson correlation coefficient will be made according to the rule: if probability is less than 0.05, then significant linear relationships between variables exist and if probability is more then 0.05, then significant linear relationship between variables does not exist. All the calculations are made with MS Excel and statistical software NCSS.

3. Results

Education is one of the main factors affecting Lithuanian labour market and development of national economy. The impact of education in Lithuanian labour market was analysed using employment and unemployment rate and ISCED (Table 1). Data of Table 1 reveal that during 2005 and 2014, employment rates rose with educational attainment. In 2014, the highest level of employment rate was among the graduates of higher education (88.4%). In Lithuania, 64.6% of population with upper secondary and post-secondary non-tertiary education were employed and the lowest level of employment rate (only 19.5%) was among populations with less than primary, primary and lower secondary education (Table 1).

Table 1. Lithuanian employment rate and unemployment rate by education level (% of age group 15–64 years) in 2005–2014

Indicators	Year									
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Employment rate by education level, %:										
levels 0–2	25.7	25.3	26.5	20.9	17.5	14.0	14.4	15.7	17.1	19.5
levels 3–4	67.2	68.3	69.0	68.2	61.7	57.5	59.7	61.7	63.0	64.6
levels 5–8	86.3	87.4	87.9	87.6	85.7	85.3	87.2	87.0	87.6	88.4
Unemployment rate by education level, %:										
levels 0–2	15.1	11.0	7.6	13.4	31.2	41.3	40.2	36.2	33.9	30.7
levels 3–4	9.5	6.6	5.0	6.7	16.5	22.0	19.2	16.7	14.5	13.7
levels 5–8	4.1	2.7	2.1	3.0	6.1	7.8	6.3	5.7	5.2	4.3

Source: Eurostat Comext Database, (2015).

Thus, the data presented in Table 1 show that higher level of education assures an increase in employment. The financial crisis had influence on number of employed and growth of unemployment rate. Analysis of unemployment rate in the period 2005–2014 indicates the impact of financial crisis on the situation in Lithuanian labour market. The unemployment rate was lowest in 2007 and the highest in 2010. The unemployment rate was the highest for individuals with less than primary, primary and lower secondary education and the lowest for population with tertiary education (Table 1). The analysis of statistical data on unemployment rate of population with higher education shows that acquiring of higher education can help to find a job and to adapt in the labour market. The analysis of statistical data on unemployment rates of the population aged 15–64 by educational level indicates that in Lithuania, the increase in the level of education reduces the unemployment risk.

In order to compare the impact of Lithuanian higher education on employment rate, unemployment rate and real labour productivity with other countries of the EU-28, the correlation analysis will be done. Correlation between the share of population with tertiary education in total population aged 15–64 in the EU-28 and employment rate significantly vary across the countries. Correlation coefficient varies from −0.97 in Slovakia to 0.89 in Germany. However, the correlation

between the share of population with tertiary education in total population aged 15–64 in the EU-28 and employment rate is negative in most countries and it is −0.65 for 28 countries of the EU. It means that the higher share of population with tertiary education does not increase the employment. The significant (probability is less than 0.05) negative correlation between these indicators is mostly inherent for weaker economies, i.e., Greece, Spain, Croatia, Italy, Cyprus, Portugal, Romania, Slovenia, Slovakia, Czech Republic and Estonia. Nevertheless, it is also detected in some most developed countries, such as Belgium, Ireland, Finland and United Kingdom.

The main reason of negative correlation between the share of population with tertiary education in total population aged 15–64 in the EU-28 and employment rate is hard recovery of the labour market after the crisis or still constant decrease of employment (like in Greece, Spain, Slovakia, Italy and some other countries) while the share of population with tertiary education in total population aged 15–64 was consistently growing during the period 2005–2014.

The significant positive correlation between the share of population with tertiary education in total population aged 15–64 in the EU-28 and employment rate is obtained only in Germany (0.89), France (0.85) and Malta (0.71), where no or only slight decrease of employment was fixed during the crisis.

Considering the situation in Lithuania, the correlation between analysed indicators is not significant, but positive (0.28) and the employment rate is the highest (88.4 in 2014) comparing with the other countries of the EU. The positive relationship between the share of population with tertiary education and employment rate can be seen in Figure 1. It can be seen that the lowest values of employment rate reflect the data of 2009–2010 years that are influenced by the crisis, and significantly affect the relationship between analysed indicators. Taking into account all the data from 2005 till 2014 years (Figure 1a), the relationship between the share of population with tertiary education and employment rate can be best defined by the third order polynomial function:

$$y = 0.008x^3 - 0.5831x^2 + 14x - 23.87 \quad (2)$$

Where *x* is the share of population with tertiary education in total aged 15–64; y is employment rate.

a b

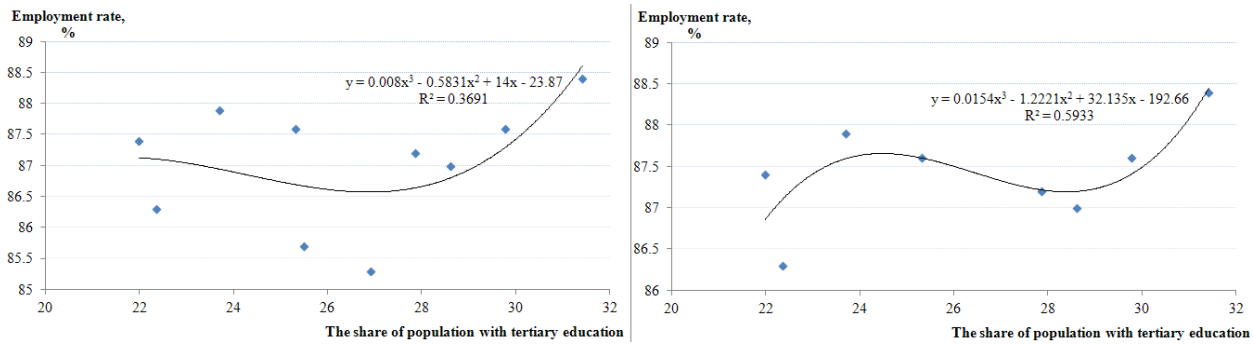

Figure 1. Scatter plots of the share of population with tertiary education in total population aged 15–64 in the EU-28 and employment rate with regression curves: (a) The data of 2005–2014 years; (b) The data of 2005–2008 and 2011–2014 years. Source: Author's calculation, Eurostat Comext Database, (2015).

The coefficient of determination of that model is 0.3691, i.e., model precision is about 37%. But if the data of 2009–2010 years are omitted (Figure 1b), then the precision of the third order polynomial model increases to 59% and the model is:

$$y = 0.0154x^3 - 1.2221x^2 + 32.135x - 192.66 \quad (3)$$

The hard recovery of labour market after the crisis also causes the positive correlation between the share of population with tertiary education in total population aged 15–64 in the EU-28 and unemployment rate. The significant positive correlation between these indicators is obtain in most countries where the correlation between the share of population with tertiary education and employment rate is significant negative, i.e., Czech Republic, Ireland, Greece, Spain, Croatia, Italy, Cyprus, Portugal, Romania, Slovenia, Slovakia and United Kingdom. The significant positive correlation between the share of population with tertiary education in total population aged 15–64 in the EU-28 and unemployment rate can be also found in Bulgaria, Austria and Luxemburg, where the relationship between the share of population with tertiary education and employment rate is also negative, just non-linear. Despite such relationship, Czech Republic, United Kingdom, Austria and Luxemburg have one of the lowest unemployment rates in the EU.

Negative correlation between the share of population with tertiary education in total population aged 15–64 in the EU-28 and unemployment rate is achieved only in Germany (−0.88) and Poland (−0.23), but correlation coefficient is significant only for the first country. This confirms that Germany was the country that was least affected by the crisis.

Unemployment in Lithuania significantly increased during the crisis and it is still higher than it was before 2008 years despite its negative trend during the last 4 years. It causes the positive correlation between the share of population with tertiary education and unemployment rate although it is not significant. The relationship between these indicators can be seen in Figure 2. It can be seen that the highest values of unemployment rate reflect the data of 2009–2010 years that are influenced by the crisis, and significantly affect the relationship between analysed indicators. Taking into account all the data from 2005 till 2014 years (Figure 2a), the relationship between the share of population with tertiary education and unemployment rate can be best defined by the third order polynomial function:

$$y = -0.0265x^3 + 2.0208x^2 - 50.575x - 419.67 \quad (4)$$

Where *x* is the share of population with tertiary education in total aged 15–64; y is unemployment rate.

a b

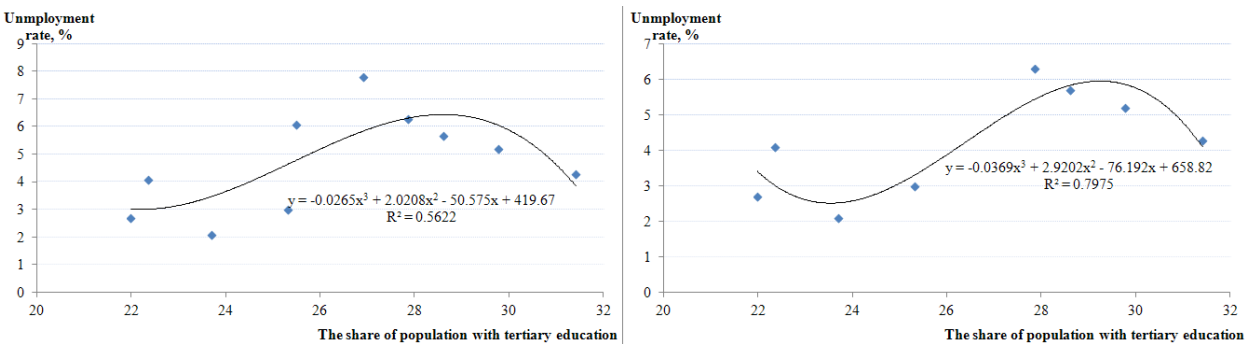

Figure 2. Scatter plots of the share of population with tertiary education in total population aged 15–64 in the EU-28 and unemployment rate with regression curves: (a) The data of 2005–2014 years; (b) The data of 2005–2008 and 2011–1014 years. Source: Author's calculation, Eurostat Comext Database, (2015).

The coefficient of determination of that model is 0.5622. But if the data of 2009–2010 years are omitted (Figure 2b), then the precision of the third order polynomial model increases to 80% and the model is:

$$y = -0.0369x^3 + 2.9202x^2 - 76.192x - 658.82 \quad (5)$$

The correlation between the share of population with tertiary education in total population aged 15–64 in the EU-28 and the real labour productivity per hour worked also greatly differs between countries. The correlation coefficient varies from −0.71 in Luxemburg to 0.98 in Spain, but it is positive in most countries. It means that despite the difficult situation in labour market, the growth of share of population with tertiary education lets increase the real labour productivity. The significant positive correlation between these indicators is in Bulgaria, Czech Republic, Estonia, Ireland, Spain, France, Croatia, Cyprus, Latvia, Lithuania, Hungary, Austria, Poland, Portugal, Romania, Slovenia, Slovakia and Sweden.

Only five countries, i.e., Greece (correlation coefficient is −0.45, but not significant), Italy (correlation coefficient is −0.42, but not significant), Luxemburg (correlation coefficient is −0.71 and is significant), Malta (correlation coefficient is −0.52, but not significant) and United Kingdom (correlation coefficient is −0.29, but not significant) fail to improve the real labour productivity when the share of population with tertiary education is increasing. Slight decrease in real labour productivity is not a great problem only for Luxemburg as the real labour productivity there is the highest in the EU, so the improvement of high real labour productivity is more difficult than the improvement of low real labour productivity. Meanwhile, the real labour productivity in Malta, Greece and Italy is lower than the average of the EU and these countries must take great attention to this situation.

The correlation between the share of population with tertiary education and the real labour productivity per hour worked in Lithuania is positive and very strong linear (0.95). The relationship between them is shown in Figure 3.

Taking into account all the data from 2005 till 2014 years (Figure 3a), the relationship between the share of population with tertiary education and the real labour productivity per hour worked can be defined by simple linear model:

$$y = 0.4089x - 1.3502 \quad (6)$$

Where x is the share of population with tertiary education in total aged 15–64; y is the real labour productivity per hour worked.

a b

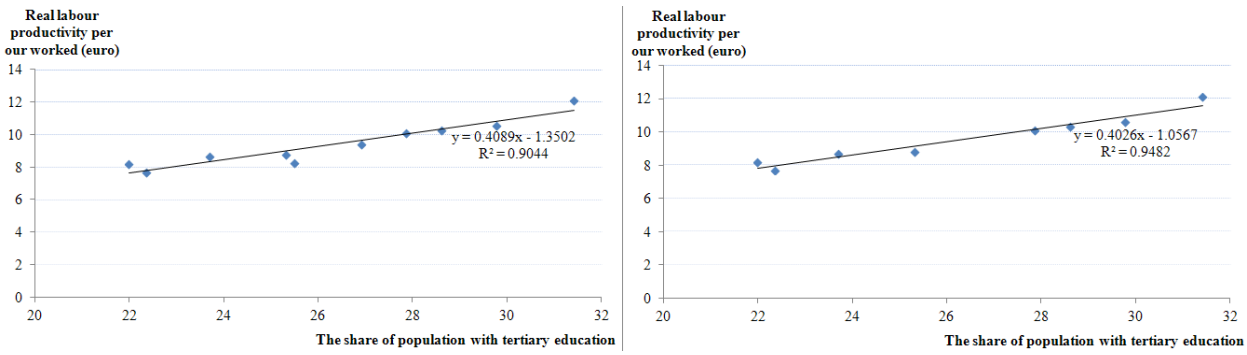

Figure 3. Scatter plots of the share of population with tertiary education in total population aged 15–64 in the EU-28 and the real productivity per hour worked with regression curves: (a) The data of 2005–2014 years; (b) The data of 2005–2008 and 2011–1014 years. Source: Author's calculation, Eurostat Comext Database, (2015).

The precision of that model is 90%. The real labour productivity per hour worked was not significantly influenced by the crisis, but nevertheless, if the data of 2009–2010 years are omitted (Figure 3b), then the precision of the simple linear regression model increases to almost 95% and the model is:

$$y = 0.4026x - 1.0567 \quad (7)$$

So, it is obvious that the growth of the share of population with tertiary education increases the real labour productivity per hour worked in Lithuania.

4. Conclusions

Education is one of the main factors affecting Lithuanian labour market and development of country's economy. It was found that the impact of higher education on labour market has been the subject of much study. Many researchers examined how education affects employment, unemployment and productivity of work. The research studies indicated that a higher level of education determines a higher employment rate, a high level of productivity of work and a lower risk of unemployment.

On the basis of ISCED, employment and unemployment rates were determined that during the period 2005–2014 in Lithuania, employment rates rose with educational attainment. Analysis shows that in 2014, the highest level of employment rate was among the graduates of higher education and the lowest level of employment rate was among populations with less than primary, primary and lower secondary education.

The results of research show that financial crisis has influence on the situation in Lithuanian labour market. The unemployment rate was the lowest in 2007 and the highest in 2010. The unemployment rate was the lowest for population with tertiary education and the highest for individuals with less than primary, primary and lower secondary education.

It was determined that higher education is the most important factor in helping individuals successfully employed in Lithuanian labour market. Research shows that the increase in the level of education reduces the unemployment risk in Lithuania. It was established that the growth of the share of population with tertiary education can help to increase the employment rate in Lithuania.

In order to compare the impact of Lithuanian higher education on employment rate, unemployment rate and real labour productivity with other countries of the EU-28, the correlation analysis will be done. It was determined that correlation between the share of population with tertiary education in total population aged 15–64 in the EU-28 and employment rate significantly vary across the countries and is negative in most countries. The main reason of negative correlation between analysed indicators is hard recovery of the labour market after the crisis or still constant decrease of employment. Analysis shows that the significant positive correlation between analysed indicators is obtained in these EU countries where no or only slight decrease of employment was fixed during the crisis.

The hard recovery of labour market after crisis also causes the impact of tertiary education on unemployment rate. It was determined that the lowest unemployment rate was in these EU countries that were least affected by the crisis. Analysis shows that despite the difficult situation in labour market, the growth of share of population with tertiary education lets increase the real labour productivity in the EU-28 countries. Thus, the results of the research show that the growth of the share of population with tertiary education increases the real labour productivity in most countries of the EU. However, a significant impact of the share of population with tertiary education on employment rate and unemployment rate has the country's economic situation.

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