Higher Education – A Solution To Unemployment? Case Study: Romania

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ABSTRACT
The purpose of this paper is to identify whether or not there is a long term relationship between unemployment and higher education demand in Romania. In order to achieve this purpose, I quantified the demand of higher education as the number of first year students to the number of highschool graduates. Next, I used the Engel-Granger methodology in order to examine the long term relationship. Also, a brief analysis on unemployment and the higher education area in the european context is provided. One of the main findings of the paper is that there is a long-term negative relationship between unemployment and higher education demand. Thus, encouraging the high-school graduates to pursue higher education may be a proper approach in reducing unemployment. The paper may be a valuable tool for policy makers in higher education.

Keywords: higher education, unemployment, demand, Engel-Granger
JEL Classification: I – Health, Education and Welfare; C – Mathematical and Quantitative Methods

INTRODUCTION
(Card’s 2001, p.1157) research has shown that education has a very high impact on earnings and employability. As (Mincer 1991, p.2) stated before him, “more educated workers enjoy three basic advantages over the less educated ones: higher wages, greater upward mobility in income and occupation and greater employment stability”. According to (OECD 2011) higher education is associated with a high level of employment and differences in unemployment rates for men and women are the smallest among those with a university diploma. Many analyses have been conducted in order to test the correlation between higher education and unemployment. For example, (Daly, Osborne and Valletta 2007, p.2), considering the USA labor market, have found out that the unemployment rate for college graduates is relatively low compared to the unemployment rate of people lacking a diploma; also, the unemployment rates pattern has been largely constant since 1978. (Riddell
and Song 2011, p.462) also pointed out that “higher education at the post-secondary level reduces the incidence of unemployment in USA”; additionally, “college education has large impacts on individuals’ ability to adjust to adverse employment shocks”.

The study of (Damon and Glewwe 2011, p.1255) highlighted the income and non-income effects of a public university at the local level: “a drop in population with bachelor degree by closing the University of Minnesota will rise the local unemployment rates and increase the state government unemployment benefits expenditures”. (Altbeker and Storme 2013, p.12) emphasized that in South Africa worsening economic conditions have less impact on unemployment of people with a higher education degree than on unemployment of people without a higher education degree. Indirectly, the unemployment rate is low among highly educated workers as “they have a comparative advantage with respect to the adjustment to implementation of new technologies” – according to (Barthel and Lichtenberg 1985, p.25) – but also because an increase in schooling increases productivity efficiency – according to (Grossman 2006, p.685).

Yet, in Europe there are many particularities of the higher education area, that should be considered. (Huisman and Kaiser 2002, p.8) pointed out that the relation between higher education institutions and employees is a major issue in most of Western European countries; also the authors observed that in the higher education area “accountability replaced trust” (Huisman and Kaiser 2002, p.12). (Nunez and Livanos 2009, p.477) studied the impact of higher education on the employment in Europe using the Labor Force survey. They distinguish between “short term unemployment (which is caused by mobility, search costs and other barriers to instantaneous arbitrage) and long term unemployment (caused by economic crisis)” (Nunez and Livanos, 2009, p. 476). They found out that “in general higher education increases the chances of employment; also higher education has a moderate impact on avoiding long-term unemployment” (Nunez and Livanos, 2010, p. 484); yet, the analysis revealed significant employment differences across fields of study: “in order to avoid short-term unemployment one should study education, engineering, services and tourism; instead, sciences, biology and environment, computer use are the best choice in preventing long-term unemployment; additionally, health and welfare field of students are neither exposed to short-term unemployment, nor to long-term unemployment; worryingly, agriculture and veterinary studies generate over the mean long-term unemployment” (Nunez and Livanos, 2010, p. 485). (Maselli 2012, p.23) analyzed the changes in employment (labor demand) in Europe between 2000 and 2010 and found out that high-profile jobs demand (managers, professionals and technicians)
increased by 20%, while middle skilled jobs demand (plant and machine operators, electrical and electronic trade workers, craft related trade workers) dropped by 4.5%; analyzing the risk of mismatch between the demand and supply of skills in the labor market, the author pointed out that many countries in the EU 27 will be affected by over-qualification and many more by low skilled unemployment; there are a few countries, Romania among them, which tend to equilibrium (Maselli 2012, p.28).

(Scarpetta and Sonnet 2012, p.5) pointed out that the 2008 recession particularly affected the low-skilled youth; the employment rate of those with less than upper secondary education dropped by 11% between 2008 and 2010, while the employment rate of tertiary graduates gained 2%. Yet, according to the authors, there are 3 European countries where tertiary educated youth have a higher risk of being unemployed than their low-skilled counterparts: Greece, Italy and Portugal (Scarpetta and Sonnet 2012, p.8). (Nunez and Livanos 2012, p.15), which analyzed the impact of education on unemployment after the crisis, concluded that “labor market conditions have worsened for the highly educated, yet such deterioration has been much stronger for the medium and low educated young workers”; worryingly, “graduates are recruited in occupations such as administrative or technical jobs, that traditionally do not require higher education skills” (Nunez and Livanos 2012, p.11).

(Fernandez 2006, p.161) using data from the Spanish Labor Force Survey pointed out that “independently of the education attained, young people always face higher unemployment rates than their adult counterparts”; second, “unemployment rates tend to decrease with the level of education attained”. Also, according to the study, considering individuals with no experience, education helps young people to leave unemployment: university graduates with short or long degrees and vocational studies are more likely to leave unemployment than compulsory or secondary graduates (Fernandez 2006, p.185). (Plumper and Schneider 2007, p. 631), who used data from Germany, argued that “higher education policies provide an attractive policy instrument for governments in fighting high unemployment”. More specifically, “governments may reduce pressure on labor markets by increasing the number of students; the increase affects the labor market almost immediately and may trigger broad support in the population under certain conditions” (Plumper and Schneider 2007, p. 631). Yet, the authors warn policy makers about the long term side effects of such a policy: a decrease in quality and an unsustainable increase in the number of students in fields that do not require high investments or small sized classes, such as humanities (Plumper and Schneider 2007, p. 633,635). (Hwang, Liao and Huang 2013, p.448), proposing a theoretical framework “in order to identify
how governments’ higher education expansion policy affects unemployment”, concluded that an “inadequate higher education expansion policy causes an increase in the unemployment rate of highly educated laborers”.

1. CURRENT SITUATION OF HIGHER EDUCATION ON INTERNATIONAL AND NATIONAL LEVEL: REMARKS

1.1 Higher education in the European context

In order to characterize the context of the present research, I will examine the higher education area in Europe according to classical Trow’s methodology. (Trow 1973, p.6,7) presents three types of higher education: elite education (only a few students have access to a university); mass education (enrollment in higher education exceeds 15% of the age group); universal access to higher education (over 50% of the age group is enrolled).

Students (ISCED 5-6) aged 20-24 as % of corresponding age population, in 2011

Figure 1

Source: Eurostat
As one can observe in figure 1, most of the European countries have exceed the 15% limit, which means that in Europe higher education is a mass education. Furthermore, countries like Lithuania, Poland or Slovenia almost touched the 50% limit. As one of the main objectives of the European Strategy Europe 2020 is to raise higher education attainment from 32% to 40%\(^1\), one could easily conclude that the European higher education is moving towards universal access. Considering the *EU Strategy Europe 2020 indicator on tertiary education* represented in figure 2, one can observe that the European countries set up ambitious targets for 2020 and some of them have already achieved these targets in 2012. United Kingdom, Iceland, Norway and Switzerland didn’t set up their targets.

**Tertiary educational attainment, age group 30-34 in 2012**

*Figure 2*

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Europe is dominated by a very high unemployment rate among youth including highly-educated ones (figure 3). There are countries where the unemployment rate of people aged 15-24 who graduated first or secondary stage of tertiary education is equal or higher than the unemployment rate of people aged 15-24, who graduated secondary education: Norway, Romania, Portugal, Cyprus, Italy, Croatia and Denmark.

Unemployment rates by highest level of education attained (%) 15-24 years, 2012

Figure 3

Source: Eurostat
Perhaps the most worrying situation is that young people (aged 15-24 years) who are not in employment and neither in education or training (figure 4). This indicator has reached 13.1% in 2012 at the European level, with higher values for women than for men.

In this context the European Council adopted in the late 2013 a new strategic framework for the higher education area. The main objectives of the European Council concerning higher education are\(^1\): “increasing the skills and employability of students and contributing to the competitiveness of European economy; improving quality in teaching and learning; implement the Higher Education Modernization strategy in programme countries and raise the capacity of partner countries; supporting the Bologna process and policy dialogues with strategic partner countries. The key actions of the strategy are\(^2\): student mobility (credit mobility, degree mobility, student loan guarantee); staff mobility (teaching assignment, professional development and invited staff from enterprises); cooperation with the main partners; support for policy reform”.

Young people (15-24 years) not in employment and not in any education and training by sex (%) in 2012

Figure 4

Source: Eurostat

1.2 Higher education and unemployment in Romania

Considering the relationship between higher education and unemployment in Romania, one can observe that the unemployment rate among higher education graduates (ISCED 5 and 6) is much lower than the unemployment rate among secondary education graduates (figure 5). Subsequently, the unemployment rate of young people not in education and training was almost double among the secondary education graduates comparing to the higher education graduates in 2012 (figure 6). The situation was not different in 2009, 2010 and 2011. Analyzing the unemployment rate by higher education attained and the unemployment rate of young people (aged 18-35) not in education and training by highest level of education attained, one can conclude that higher education may have a significant role in reducing unemployment.

Next, I shall examine the long term relationship between the demand of higher education and the unemployment rate in Romania. As education is one’s of the key facts that determines ones perspectives on the labor market, the analysis may be a useful tool for policy makers in higher education and labor market: if higher education can help reduce unemployment, then policies may be designed in order to encourage young people to pursue this type of education; otherwise, the educational system should offer alternatives to high school graduates and even to compulsory education graduates.

Unemployment rates by highest education attained (%) in Romania

Figure 5

Source: Eurostat
2. METHODOLOGY

In order to analyze the long term relationship between the higher education demand and unemployment, I used the data for the unemployment rate, high school graduates and first year higher education students between 1991 and 2012. The source of the data is the National Institute of Statistics of Romania. To effectively quantify the demand for higher education I have created the following indicator:

\[
\text{Demand in Higher Education} = \frac{\text{Number of first year students in S Level of Higher Education}}{\text{Number of High school graduates}} \quad [1]
\]

Next I used the classic Engel-Granger Two Step Methodology in order to establish whether or not there is a long term relationship between unemployment and higher education demand. A brief description of the methodology is described below:
First the two series should be integrated of the same order (the Augmented Dickey-Fuller test will be performed; if both series are non-stationary at the same level, one can admit that they are integrated of the same order).

The Augmented Dickey-Fuller hypothesis are:

\[ H_0 = \text{The data set has a unit root (is not stationary)} \]
\[ H_1 = \text{The data set is stationary} \]

Secondly, a linear combination of the series must be stationary (the Augmented Dickey-Fuller test will be performed on the residuals resulting after the linear regression between the two variables; if the residual series is stationary, one can conclude that the combination of the two variables is stationary).

The linear regression is:

\[ Unemp_t = a + b \cdot Dem_t + u_t \quad [2] \]

\[ Unemp - \text{The unemployment rate}, \]
\[ Dem - \text{Demand of Higher education}, \]
\[ u - \text{residual series}, \]
\[ t - \text{time period (1991 - 2012)} \]

The maximum number of lags used is 1 in order not to lose many observations.

The Schwartz Criterion was chose in order to establish the lag.

The significance level chosen is 0.05. Thus, if the P-value resulted after the test is below 0.05, I reject the null hypothesis.

3. RESULTS

As one can observe from table 1, both the unemployment and demand of higher education series are not stationary at level computation: the p-value is higher than 0.05, so we accept the null hypothesis (the data set has a unit root test).
The Augmented Dickey-Fuller Test – P-value Level

<table>
<thead>
<tr>
<th>Augmented Dickey-Fuller Test</th>
<th>Unemp</th>
<th>Dem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trend and Intercept</td>
<td>0.1208</td>
<td>0.9964</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.2777</td>
<td>0.333</td>
</tr>
<tr>
<td>None</td>
<td>0.5256</td>
<td>0.5818</td>
</tr>
</tbody>
</table>

Considering the first difference of the data set, table 2 shows that both series are stationary at the first difference. Thus, the series are integrated of the same order.

Augmented Dickey-Fuller P-value 1st difference

<table>
<thead>
<tr>
<th>Augmented Dickey-Fuller Test</th>
<th>Unemp</th>
<th>Dem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trend and Intercept</td>
<td>0.0472</td>
<td>0.1536</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.0088</td>
<td>0.1244</td>
</tr>
<tr>
<td>None</td>
<td>0.0004</td>
<td>0.0142</td>
</tr>
</tbody>
</table>

Next, I tested the residuals of the linear regression between the unemployment rate (dependent variable) and the demand of higher education (independent variable). The results are shown in table 3. One can deduce that the residuals are level stationary.

Augmented Dickey-Fuller P value - level of residual series

<table>
<thead>
<tr>
<th>Augmented Dickey-Fuller Test</th>
<th>Resid01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trend and Intercept</td>
<td>0.1427</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.1031</td>
</tr>
<tr>
<td>None</td>
<td>0.0087</td>
</tr>
</tbody>
</table>

Source: Designed by the author

The equation resulted is:

\[
\text{UNEMP} = -0.025 \times \text{DEM} + 9.8 \ [3]
\]

Thus, an increase with 1 pp in the demand of higher education can result in a decrease with 0.025 pp in the unemployment rate.
CONCLUSIONS

Across Europe there is an obvious trend of massification in higher education: over 30% of people aged 20-24 are students and over 30% of people aged 30-34 are higher education graduates; moreover, the Europe 2020 Strategy sets 40% as the target of the proportion tertiary education graduates in the corresponding age population. Romania is no exception: over 25% of people aged 20-24 are students and over 20% of people aged 30-34 are higher education graduates.

Analyzing the unemployment rate among the tertiary graduates in Europe, one can observe that it is usually lower than among their secondary counterparts; yet, there are some countries where the unemployment rate of people aged 15-24 who graduated first or secondary stage of tertiary education is equal or higher than the unemployment rate of people aged 15-24 who graduated secondary education.

Further, there is an obvious long-term relationship between the demand of higher education and the unemployment rate in Romania. With the increase of the number of first year students to the total amount of high school graduates, the total unemployment rate decreases. This is a natural relationship given the fact that the unemployment rate in among high school graduates is higher than the unemployment rate among tertiary education graduates. Yet, as literature warns, policy makers should proceed with extreme caution in implementing mass education policies in order to preserve sustainability and quality in higher education.

REFERENCES


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