

IMPACT OF ECONOMIC CRISIS ON STUDENT DEMAND FOR TERTIARY EDUCATION

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Abstract:

Knowledge societies emphasise the importance of education as one of the key factors for economic and social progress. The global economic crisis increased these expectations even further. Our research focused on whether the demand for tertiary education changes during economic crisis. Changes in demographics are also an important factor influencing demand for tertiary education. These changes coincide with the effects of the economic crisis. We divided the countries into two groups based on the impact of the global economic crisis on their economies: economically more affected and economically less affected countries. Using these two groups, we studied the changes in demand for tertiary education between 2008 and 2012. We found that demand for tertiary education was higher in the economically less affected countries. However, in the economically more affected countries, the share of young people of the typical tertiary education enrolment age in the population fell sharply. As a result, the gross enrolment ratio was higher in the economically more affected countries. Our findings contribute new knowledge and reflect on the impact of the economic crisis on the changes in tertiary education, which can be used to inform tertiary education policies in order to achieve better outcomes in tertiary education and in the society as a whole.

Keywords: tertiary education, economic crisis, demographics, enrollment

1. INTRODUCTION

From 2008, the effects of the global financial and economic crisis spread quickly and had a high impact on the economies of all countries and all sectors of a country, including an important impact on tertiary education systems all over the world. However, the impact of the financial and economic crisis on tertiary education systems varied between countries, due to the different forms and structures of tertiary education systems in individual countries (Eggins and West 2010, Skrbinjek and Lesjak 2014). This makes it an interesting research topic.

Grim employment prospects during a crisis encourage young people to continue their study and enrol in tertiary education (Santiago, 2010, p. 7), thus postponing their entry into the job market. This is especially true in tertiary education systems with no tuition fees or low tuition fees and high social transfers. However, we believe that the current demographic situation also strongly affects enrolment trends and shapes the demand for tertiary education. We believe that the demand for tertiary education is increasing more in the economically more affected countries than in the economically less affected countries, because the opportunity cost reduces greatly and the likelihood of unemployment increases (Varghese, 2010, p. 16; Breneman, 2009, p. 272).

We obtained data for 30 countries (27 European Union member states¹ and 3 European Free Trade Association (EFTA) members) from the Eurostat database. We faced limited data availability and relevance, as well as missing values, which limited our research to a period between 2008 and 2012.

Our research focused on the changes in demand for tertiary education in correlation with the impact of the economic and financial crisis on countries' economies. To examine the changes in demand for tertiary education i.e. the changes in student numbers, we posed the following research question: "In times of economic and financial crisis, is student demand for tertiary education increasing faster in economically more affected countries than in economically less affected countries?"

2. METHODOLOGY, DATA AND VARIABLES

We used the cluster analysis method to establish the impact of the economic crisis in different countries. We used hierarchical clustering with Ward's method and Euclidean distance, which is suitable even with a small number of units surveyed. Ward's method takes into account the sum of squared deviations of the corresponding classification, and where there is more than one variable, adds up the squared deviation sums for all variables (Kosmelj and Breskvar Zaucer, 2006, p. 303). In our case, we first standardised the variables, as they also varied in units and intervals of values.

The data was taken from the Eurostat database and analysed with statistical programme R-commander. The total number of units is 30, representing 27 EU members and 3 EFTA members². Thus, there are some limitations according to the data used linked to uncertainty, missing values and rather generalized data. In order to provide the missing data we looked into OECD database and complement Eurostat database. We were unable to include any other country due to the lack of data, as clustering does not allow for missing values. We assumed that the selected variables reflect the actual differences in macroeconomic and fiscal indicators between countries, although the data we used could potentially be inaccurate.

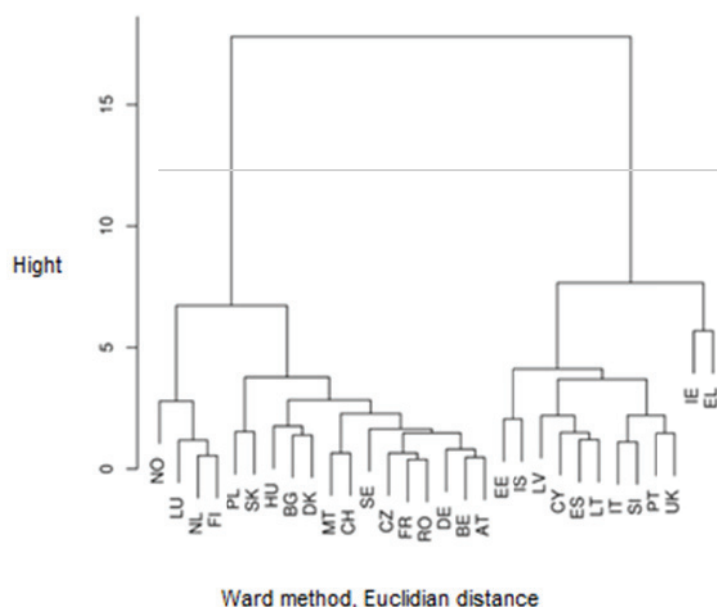
We clustered the countries using five variables that relate to changes in 2009-2012 compared to 2008³: GDP per capita index in PPS, real GDP growth rate, unemployment rate, fiscal surplus/deficit and gross debt, calculated as the difference between extreme values, i.e. the minimum or the maximum value between 2009 and 2012 compared with the value of the indicator in 2008. In doing this, we captured the extent of the impact of the crisis on individual countries. The average real GDP growth was calculated as a geometric mean, which gives a better mean value than the arithmetic average when growth rates fluctuate significantly year on year.

¹ Our analysis does not include the latest European Union member, Croatia, as the major part of our research was carried out before Croatia joined the European Union on 1 July 2013.

² The 3 EFTA members included in the research are Iceland, Norway and Switzerland.

³ The crisis period covered is between 2009 and 2012, as the latest data available is for 2012. The data for 2008 was used as a comparative data, reflecting the state of the economy before the crisis.

Figure 1: Clustering Dendrogram



Note: Belgium (BE), Bulgaria (BG), Czech Republic (CZ), Denmark (DK), Germany (DE), Estonia (EE), Ireland (IE), Greece (EL), Spain (ES), France (FR), Italy (IT), Cyprus (CY), Lithuania (LV), Latvia (LT), Luxembourg (LU), Hungary (HU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), Slovakia (SK), Finland (FI), Sweden (SE), United Kingdom (UK), Iceland (IS), Norway (NO), Switzerland (CH).

The result of clustering are two clearly distinguished groups, shown in the dendrogram above (Figure 1). We will therefore use these two groups in our data analysis. The table 1 below shows the clustering results, with 18 countries falling into the first and 12 countries falling into the second group. It is apparent that the countries in the first group have had, on average, a smaller fluctuation in GDP per capita index (in PPS), higher average real GDP growth rate (between 2008 and 2012) and lower average amplitude of the unemployment rate, fiscal deficit and gross public debt. We can therefore conclude that the first group comprises of countries that were economically less affected than the second group of countries, which were economically more affected by the financial crisis. We will therefore refer to the first group as *the economically less affected countries* and the second group as *the economically more affected countries*.

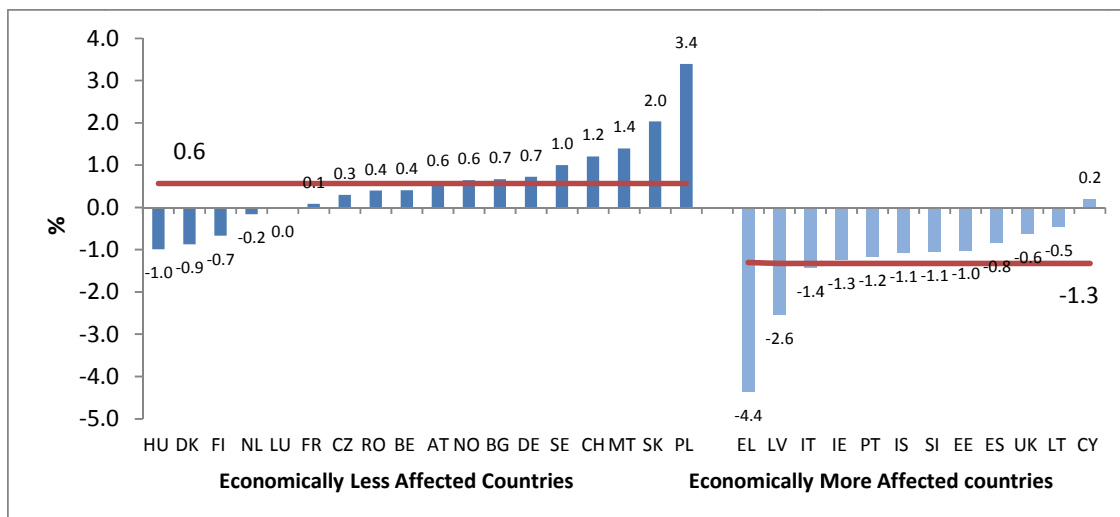
Table 1: The clustering of countries into groups, based on economic indicators

Group name	Group 1: Economically Less Affected Countries		Group 2: Economically More Affected Countries	
Number of Countries (N)	18		12	
Countries	NO, LU, NL, FI, PL, SK, HU, BG, DK, MT, CH, SE, CZ, FR, RO, DE, BE, AT		EE, IS, LV, CY, ES, LT, IT, SI, PT, UK, IE, EL	
Statistical Significance	μ	σ	μ	σ
Change in GDP per Capita Index	-1.500	4.756	-7.083	4.033
Average GDP Average Growth	0.563	1.049	-1.305	1.162
Change in Unemployment Rate	2.317	1.687	8.958	4.326
Change in Surplus/Deficit	-4.256	2.293	-5.900	6.423
Change in Gross Public Debt	12.256	7.549	36.475	18.136

Note μ - average, σ – standard deviation

The average real GDP growth rate was positive at 0.6 % in economically less affected countries, while the average economic growth in economically more affected countries was at -1.3 %. The average GDP growth was negative for almost all economically more affected countries, with Greece particularly standing out. The only exception was Cyprus, which had a very modest positive average growth. Amongst the economically less affected countries, only Poland and Slovakia had a relatively stable GDP growth (Figure 2).

Figure 2: Average real GDP growth, in %, between 2008 and 2012, by groups



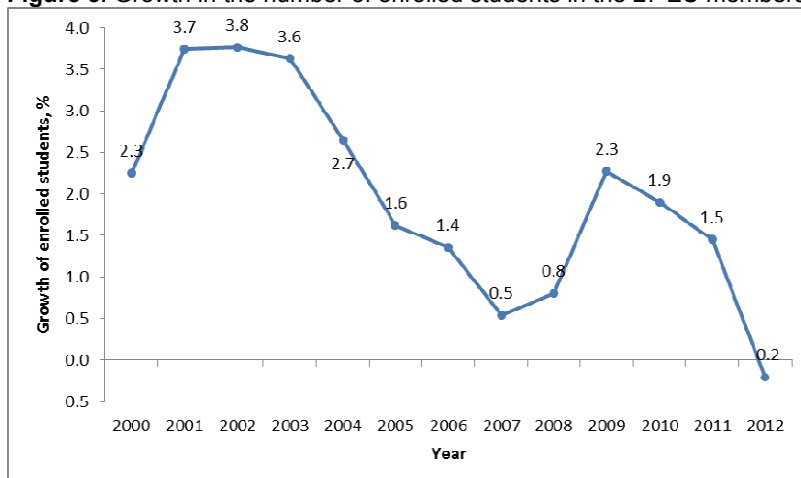
Source: Eurostat (2013) GDP and main components - Current prices [nama_gdp_c]

3. DEMAND FOR TERTIARY EDUCATION

3.1. Changes in the number of enrolled students

To a large degree, the number of students is a reflection of the size of a country and the number of young people in a country, and therefore varies greatly from one country to another. Until 2011, there was a positive growth in the number of enrolled students in the 27 EU members (Figure 3). The largest increase in the number of enrolled students was between 2001 and 2003, when the annual growth was at almost 4 percent. The annual growth then dropped to below 1 percent in 2007 and 2008, before increasing again in 2009. The growth in the number of enrolled students remained strong until 2011, but started to fall again in 2012.

Figure 3: Growth in the number of enrolled students in the 27 EU members between 2000 and 2012



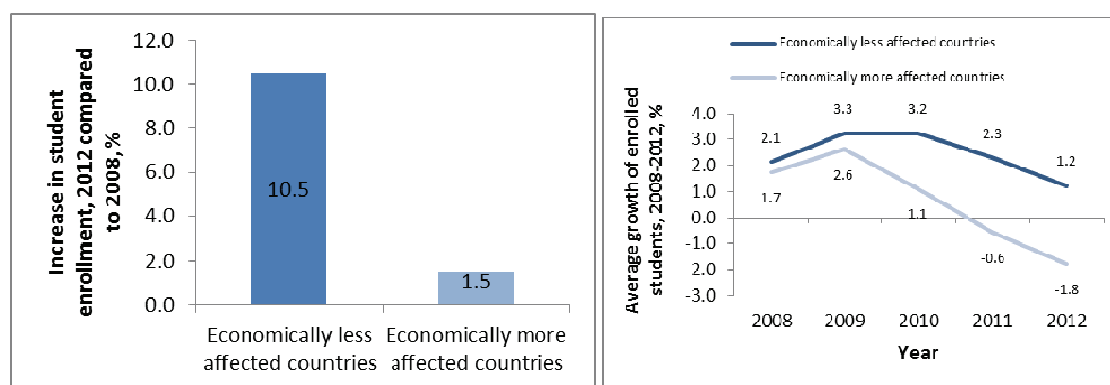
Source: Eurostat (2014) Tertiary education participation [educ_iterpt]

According to Eurostat, there were more than 20 million students in tertiary education in the 27 EU members in 2012, of which 12.5 million were in the economically less affected countries and 8.1

million in economically more affected countries. The Figure 4 (left) below shows the increase in the number of enrolled students in 2012 compared to 2008 for each group of countries. The increase in the number of enrolled students was 9 percentage points higher in the economically less affected countries compared to the economically more affected countries. At first glance, these findings contradict our expectations because the number of enrolled students increased higher in the economically more affected countries.

The growth in the number of enrolled students shown in Figure 4 (right) shows an increase in the number of enrolled students in 2009 in both groups of countries. We can see that in 2010 the number of enrolled students in economically more affected countries grew slower and started to decline in 2011 and 2012 (by -0.6 % in 2011 and -1.8 % in 2012). The economically less affected countries maintained a high growth of enrolled students even in 2010, although the growth began to slow down in 2011 and 2012.

Figure 4: Increase in the number of enrolled students in 2012 compared to 2008, (in %) (left), and average growth of enrolled students by groups, (in %), 2008–2012 (right)



Source: Eurostat (2014) Tertiary education participation [educ_itertp]

Differences in the demand for tertiary education between the two groups of countries could be a result of various factors, which can be linked to policies on access to higher education, student financial support systems, demand for high skills at the labour market, and demographic trends (European Commission/EACEA/Eurydice, 2011, p. 33). Below, we address the demographic factor in more detail as it can offer a substantially different explanation for the changes in the number of enrolled students between both groups of countries.

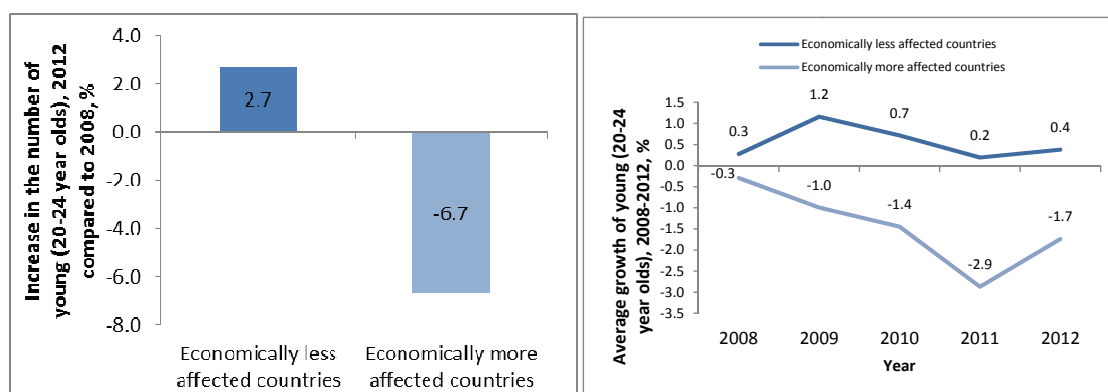
3.2. Impact of the demographic factor

The number of enrolled students can be significantly affected by the demographic factor. We will therefore verify whether changes in the growth in the number of students are a consequence of demographic trends. In particular, we wanted to establish how the number of enrolled students is changing in relation to the number of young people aged 20-24 in both groups of countries, as the 20-24 year olds are the most represented group among students.

We can see that the change in the number of young people (20-24 year olds) in economically more affected countries in 2012 compared to 2009 was negative (-6.7 %), which means that the number of young people in these countries was declining. On the other hand, there was a positive change (2.7 %) in economically less affected countries (Figure 5, left). This means that the demographic factor had a big impact on the student enrolment trend in the economically more affected countries.

In addition, we examined whether there is a statistically significant correlation between an increase in the number of enrolled students and a change in the number of young people in the most typical age group (20-24 year olds) with respect to the two groups of countries. We tested this using Spearman's correlation coefficient, which is based on the ranking of units and looks for a relationship between the differences in the ranking of variables.

Figure 5: Increase in the number of young people (20–24 year olds) in 2012 compared to 2008 (in %) (left); and average growth in the number of young people (20–24 year olds) by groups (in %), 2008–2012 (right)



Source: Eurostat (2013) Population on 1 January by five years age groups and sex [demo_pjangroup] and Eurostat, Tertiary education participation [educ_itterp]

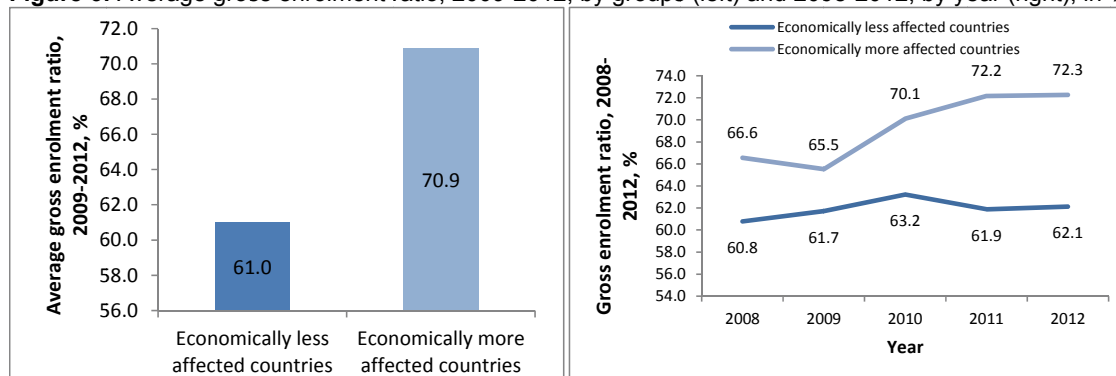
We find that in the economically less affected countries the correlation between the two variables is statistically significant and of a medium strength ($r = 0.561$, statistical significance: 0.019), which means that we can say, with a 5 % risk, that demography has a statistically significant influence on the increase in student enrolment in the group of economically less affected countries. A decline in the number of young people is particularly evident in Poland, Slovakia, and Romania, where the number of enrolled students also dropped. In the Czech Republic and Bulgaria enrolment increased even though the number of young people dropped. In other countries, the increasing number of young people is reflected in the increasing number of enrolled students.

In the economically more affected countries, the correlation between the increase in the number of young people and the increase in student enrolment is of a medium strength but statistically insignificant ($r = 0.545$, at significance level: 0.067). On average, the increase in student enrolment between 2009 and 2012 was positive (1.5 %), while the number of young people decreased considerably (-6.7 %) (see Figure 4 and Figure 5). Between 2008 and 2012, the number of young people decreased in most countries. Nevertheless, Ireland, Spain, Greece, Portugal and Estonia managed to increase the enrolment of students.

3.3. Gross enrolment ratio

Considering that the demographic factor has a statistically significant impact on the change in the number of enrolled students, it is important that we consider it in our analysis of changes in demand for tertiary education. For this purpose, we specified a gross enrolment ratio indicator, which is calculated by dividing the total number of enrolled students by the number of young people (20–24 year olds). This indicator involves a high degree of generalisation, however, it is important that we consider the impact of the demographic factor and identify changes in student enrolment in both groups of countries.

Figure 6: Average gross enrolment ratio, 2009–2012, by groups (left) and 2008–2012, by year (right), in %

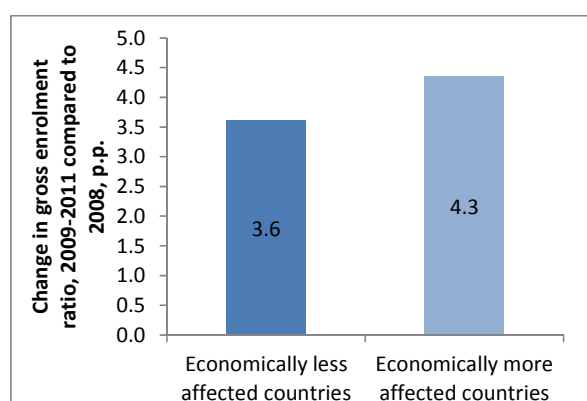


Source: Eurostat (2014) Students by ISCED level, age and sex [educ_enrl1tl] in Population on 1 January by five years age groups and sex [demo_pjangroup]

Despite a lower growth in the number of enrolled students (Figure 4), economically more affected countries have, on average, a higher student population than the economically less affected countries, which is reflected in a higher gross enrolment ratio (70.9 %) (Figure 6, left). This indicator certainly shows that the demand for tertiary education is comparatively higher in economically more affected countries than in economically less affected countries. We cannot, however, argue that this is a direct consequence of the economic crisis.

Therefore, taking into account the number of young people, the demand for tertiary education is increasing faster in the economically more affected countries compared to economically less affected countries, which is also evident in the Figure 7. A higher positive change in gross enrolment ratio in economically more affected countries could also mean that a higher number of older people are enrolled in tertiary education.

Figure 7: Change in gross enrolment ratio, 2009–2012 compared to 2008 (in percentage points)



Source: Eurostat (2014) Students by ISCED level, age and sex [educ_enrl1tl] in Population on 1 January by five years age groups and sex [demo_pjangroup]

4. CONCLUSION

The economic crisis had a diverse impact on European countries. Before the start of the crisis (in 2008), the countries that were economically more affected during the crisis already had, on average, a lower GDP per capita, higher unemployment rate, higher fiscal deficit, and only slightly higher gross public debt than the economically less affected countries. This means that they were already lagging behind the economically less affected countries, however, the impact of the economic and financial crisis significantly increased the gap between the two groups and the economically more affected countries fell even further behind the economically less affected ones.

We established that the increase in the number of enrolled students in 2012 compared to 2008 was higher in the economically less affected countries than in the economically more affected countries because the share of the young people (20-24 year olds) decreased significantly in the economically more affected countries, which partly affected the size of student population. If we also take into account the demographic factor, the gross enrolment ratio is higher in economically more affected countries. The change in gross enrolment ratio was also higher in economically more affected countries, which suggests that the enrolment of students in these countries increased more despite a decreasing population of the most typical age group enrolling into tertiary education.

Some further research can also consider other factors that encourage or prevent students to enrol in tertiary education, for example student finance systems, opportunity costs, return rates and employment perspectives.

Economic crisis has undoubtedly increased the gap between the countries, especially between the economically less and economically more affected ones, as defined on the basis of five key macroeconomic and fiscal indicators. For this reason, the Europe 2020 strategy (European Commission, 2010) particularly emphasized the role of tertiary education in economic recovery and exiting the crisis, which would allow the European economies to become even smarter, more sustainable and inclusive, and thus stronger than before the crisis. Undoubtedly, the economic and

financial crisis left a significant mark on European tertiary education systems, which was also the motivation for our research.

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