TERTIARY EDUCATION IN ROMANIA AND IN THE EUROPEAN UNION

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Abstract: *Tertiary education is a very important variable in order to explain the evolution of a country. The present paper takes into consideration the dynamics of the people included in the tertiary education (especially students) in Romania and in the European Union (27 countries). The paper also presents the results of a statistical model in order to explain the influence of some chosen factors over the explained variable. The chosen factors for the model are Harmonised Index of Consumer Prices, the annual consumption, with its most important element, household final consumption and the number of employees.*

Key words: *tertiary education, consumption, regression, influence.*

1. Introduction

The explained variable in this model, meaning the number of people who are part of the tertiary education system, is defined as the total number of people who are a part of that system, including high education studies and non high education studies from every country.

The paper takes into consideration the countries from the entire European Union, i.e. 27 countries, and compares their situation, as an average, with that existing in Romania.

That indicator measures the people who have access to that type of education but, also those who are expected to finish their studies, contributing, at the same time, to the increase of the education level in their countries [1].

The most important thing in this model is that the people who are expecting to finish their studies are considered those who intended to work in the countries in which they finished their studies.

The explicative variables taken into consideration in this model were the Harmonised Index of Consumer Prices, the annual consumption, with its most important element, the household final consumption expenditure, and the number of employees [1].

HICP, or Harmonised Index of Consumer Prices, measures the inflation of the consumption products in the euro zone, and it is calculated by EUROSTAT with harmonised statistical methods.

The annual consumption measures the total incomes for goods and services used to satisfy the needs of an individual or of groups.
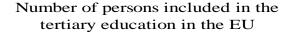
The model aims to demonstrate whether there is any correlation between those factors, and particularly whether the number of people in tertiary education is influenced by these three factors.

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2. Tertiary education evolution in Romania and the European Union

The evolution of the people included in tertiary education in the European Union between 2002 and 2008 is [6]:

Number of persons included in the
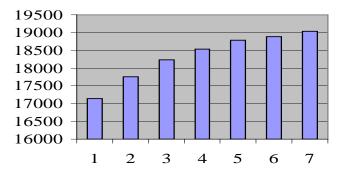tertiary education in the EU

Fig. 1. *Evolution of the number of people in tertiary education, in UE*

We can observe that, in the European Union, the number of people included in tertiary education, especially students, has increased each year, from 17139,3 thousand people in 2002, to 19049,2 thousand people in 2008, meaning an increase of 11,09%.

The most significant increase was in 2003, as compared to the previous year 2002, by 622,5 thousand people, meaning an increase of 3,63%.

The increase has continued in the following years, but in a different rate, so in the last year analyzed, 2008, the number of people included in the tertiary education system was higher than in 2007 with 156 thousand people, meaning an increase of 0,83%

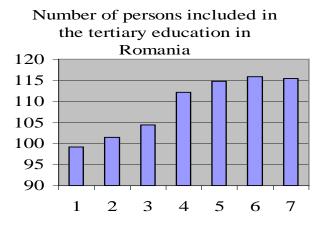At the same time, in Romania, the evolution of the same indicator was [6]:

Number of persons included in
the tertiary education in
Romania

Fig. 2. *Evolution of the number of people in tertiary education, in Romania*

On the whole, compared with the European Union, in Romania there are only 0,006% of people in tertiary education.

The number of people attending tertiary education has increased every year, from 99,2 thousand people in 2002, to 115,9 thousand people in 2007, meaning an increase of 16,7 thousand people (16,83%). In the next year 2008, the number decreased to 115,4 thousand people, meaning a decrease of 500 people (0,43%).

The most significant increase in Romania was of 7,47%, in 2005, as compared with the previous year 2004, meaning 7800 people[2].

Nevertheless, as an average, the increase rate in Romania is 2,5% every year, almost 0,75% higher than in the European Union.

3. Correlations

In order to test the correlation between the number of the three variables chosen for the model, the Harmonised Index of Consumer Prices, the annual consumption, with its most important element, final household consumption expenditure and the number of employees, the scatter graphics ,were built, in order to see if there is any link between them and the explain variable.

For both the European Union and Romania, the situation presents a direct correlation between the explain variable, number of people from tertiary education, and the other variables taken into consideration in the model.

That means that, if any of the three variables (Harmonised Index of Consumer Prices, the annual consumption, with its most important element, final household consumption expenditure and the number of employees increases, the explain variable increases too, and if they decrease, the number of people from tertiary education decreases, as well.

This analysis suggests only the type of the correlation, but it does not give us any information about its intensity, so it is necessary to continue the demonstration using statistical indicators like the CORREL function [4].

The results show us that, for the Harmonised Index of Consumer Prices and the number of employees, both for Romania and the European Union, there is a direct and strong correlation with the number of people included in tertiary education.

For the other variable, the annual consumption, the correlation has a decisive influence, meaning over 95%.

That means that the annual consumption best explains the number of people included in the tertiary education.

The next step of the analysis is to confirm the conclusion taking into consideration the regression method.

The results show that the multiple correlation coefficients (Multiple R) have a very high value, over 99%, and even more, while the determination correlation coefficient (R Square) has a value very close to 1.

That shows that the chosen variables explain the model in proportion of 99%.

However, in the trust intervals (below and above 95%) for the first variable (Harmonised Index of Consumer Prices) the 0 value occurs, meaning that we cannot guarantee in a proportion of 95% that the model is good and, consequently, we have to eliminate this variable to improve the model [5].

The new regression model is better than the last one and shows that, this time, we can guarantee in a proportion of 95% that the results are good and the explained variables determine in proportion of 99% the number of people included in tertiary education, the rest of 1% representing the influence of other factors [3].

4. Conclusions

The chosen statistical model took into consideration the correlation between the influences of some factors, like the Harmonised Index of Consumer Prices, the annual consumption and the number of employees, with the number of people included in tertiary education, especially the number of students.

Both dynamic series have an increasing trend so, using a linear function, we can predict that, in 2012, there will be 143000 students in Romania, as compared to 137000 students in 2011.

The final econometric model shows that the situation is almost the same in Romania and in the European Union for the explicative variables.

The explained variable is strongly influenced by the annual consumption for a person and the percentage of the employed people.

That means this is a positive situation: when the annual consumption increases, the number of people included in the higher education system also increases.

This indicates at least a tendency to invest into the future.

At the same time, there is also a correlation between the number of the employed and the number of people from tertiary education, which may suggest that at least a part of the people who work support their families and even more, want that their children to go to school, including the higher education system, and to specialise themselves in some fields in which to work in the future.

References

1. Begu, L. S.: *Statistică Internaţională*. Editura ALL BECK, Bucureşti. 1999.
2. Constantin, S., Petcu, N.: *Statistică - studii de caz.* Editura Infomarket, Braşov. 2000.
3. Mitruţ, C., Isaic Maniu, A., Voineagu, V.: *Statistică Economică*. Editura Dacia Europa Nova, Lugoj. 2000.
4. Petcu, N.: *Statistica. Teorie şi aplicaţii în SPSS*. Editura Infomarket, Braşov. 2003.
5. http://en.wikipedia.org/wiki/F-test. Accessed: 07-03-2011.
6. http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/ Accessed: 08-03-2011.