
CHANGES IN ROMANIAN HIGHER EDUCATION AFTER 1990

Ph.D. Candidate Assistant professor Raluca Mariana DRĂGOESCU
Academy of Economic Studies, Bucharest

Abstract

Education is one of the key factors in the economic development of any country. The higher education system in Romania has undergone major transformations in the last 23 years. This paper introduces the evolution of some indicators characterizing higher education in Romania in the last 23 years. In this period we have witnessed an important increase in the number of students but this increase was not correlated with increased numbers of teachers or endowment development. Extensive development can not be sustained on long-term, which has been shown in the past 3 years when the number of students began to drop. The data presented in this study come from the NIS, UNESCO Institute for Statistics and EUROSTAT. Data processing has been made using econometric methods such as ADF unit root tests and Granger Causality.

Keywords: higher education, education statistics, Granger causality, unit root

The education system in Romania, and implicitly higher education is in a full process of change. New trends recorded after 1990 and the process of globalization require repositioning higher education institutions in the economic and social environment.

Development of higher education system requirement stems from the fact that economic development of a country is directly related to human capital. In his studies, performed on the economy of over 100 countries between 1965 and 1995 Barro (Barro, 2002) shows that education, especially higher education has a direct influence on the rate of economic growth. Empirical work of Barro (Barro, 2005) regarding the growth rate of real GDP per capita in the U.S. reveals that years of secondary and higher education contribute positively toward economic growth.

Also McMahn (McMahn, 1999) shows a number of growth models that highlight the positive role played by education in ensuring economic development on the medium and long term.

Romania as part of the EU has made considerable efforts to implement the Bologna and Lisbon standards, but nevertheless we still found gaps and

lack of correlation between education and the labor market. After the political changes in 1989 with the fall of the communist regimes in Eastern Europe, all countries in this part of Europe experienced major changes in education systems and Romania was no exception.

Among the changes in the legislation governing higher education in Romania one must mention the appearance of Law 88/1993 (law of accreditation of higher education institutions) amended by Law 144/1999, Law 84/1995 (Education Law) - the first education law since 1989, Law 288/2004 that implements the Bologna process, structuring the higher education on three levels (undergraduate, master and doctoral studies) and Law 1/2011 (Law of National Education) that brings a new reform in the education system in Romania.

After 1990 we witnessed two important changes: the appearance of the first private universities offering programs of study especially in the economic field as well as the increase of the number of public universities and an impressive increase in the number of students. The strong increase of the number of students was not however correlated with an increase in the same proportion of the endowment of the education system and the teaching staff, which inevitably led to a decreased quality of education. We also noted a lack of correlation between the increasing number of students and demographic phenomena in Romania that faces a population decline and ageing.

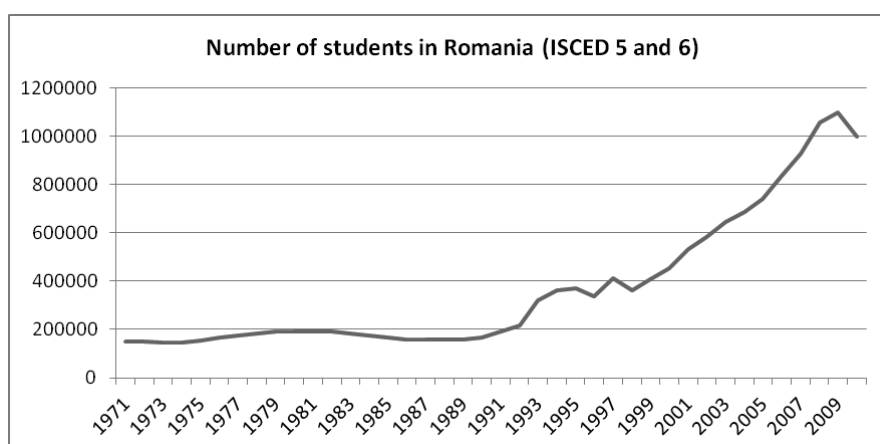
These demographic phenomena are specific to all EU countries that recorded a fairly constant population number while we assist to an explosive growth of global population. Moreover, EUROSTAT Yearbook 2010 shows that the number of newborns decreased from 11.9 million/year in 1960-1965 to only 7.4 million/year in 2000-2005. However, the number of students in Romania has grown spectacularly and only in the last two-three years Romania felt the effects of the demographic phenomena.

The problems facing higher education system today can be summarized as finding alternative sources of funding, linking university curricula to labor market needs, increasing the number of teaching staff and improving the structure of university teaching staff (Andrei et al., 2010, Andrei et al. 2009).

We used data sets provided by the NIS, EUROSTAT and UNESCO to analyze the changes that higher education system experienced over the last 23 years. We analyzed the evolution of some indicators characterizing the higher education system such as the number of students, number of students in the first year of study, the number of high school graduates, the number of teaching staff in higher education and indicators related to the endowment of the higher education. We used a number of econometric techniques such as ADF tests, cointegration tests, Granger causality to characterize these data series.

Higher education has undergone major transformations in Romania after the events of 1989. First, we have witnessed a dramatic increase in the number of students. In the following we present the evolution of the number of students (ISCED level 5 and 6) from 1971 to 2010.

**Evolution of the total number of students in Romania
in the period 1971-2010**

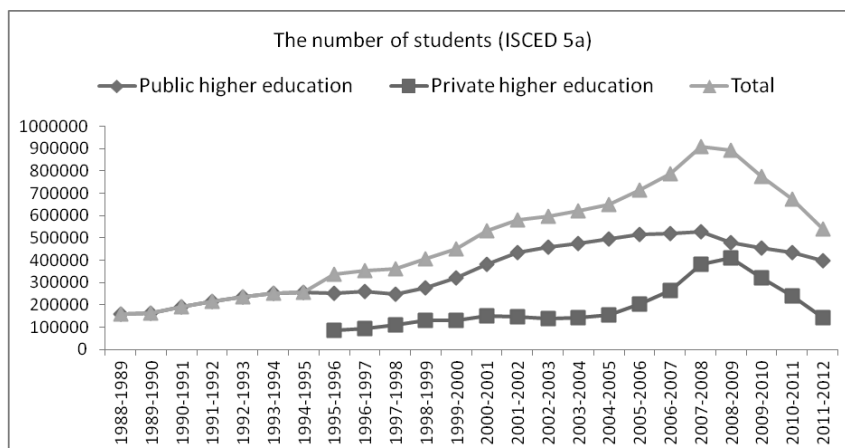


(data source: UNESCO Institute for Statistics)

Thus, it can be seen that the number of students during 1971-1989 period of time remained relatively constant but during the period 1990-2010 the number of students increased from 164,507 to 999,523 students which was an increase of about 6 times. Also, the number of higher education institutions has grown from 56 universities (with 186 faculties) in 1990 to 107 universities (with 629 faculties) in 2010. The teaching staff also increased from 11,810 in 1990 to 27,765 in 2011, but that was an increase of only 2.35 times compared with an increase of 6 times of the number of students. This has led to a degradation of the quality of higher education by increasing the ratio between the number of students and teaching staff.

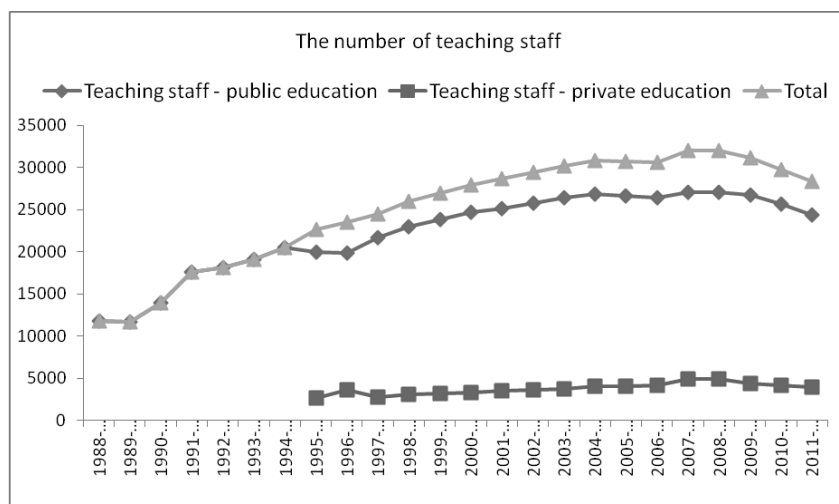
In the period after 1990 we recorded the appearance of the first private universities as an alternative to the public education. In the following we show the evolution of the number of students in undergraduate education in the period 1990-2011 highlighting both public education and private education, the evolution of the number of teaching staff and the ratio between the number of students and number of teaching staff.

Number of students in public and private education



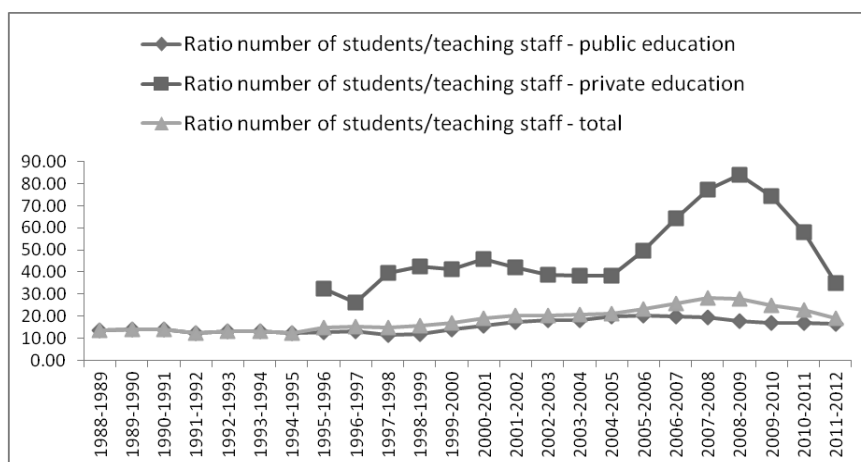
(data source: NIS)

Number of teaching staff in public and private higher education



(datasource : NIS)

The ratio between the number of students and teaching staff in public and private education

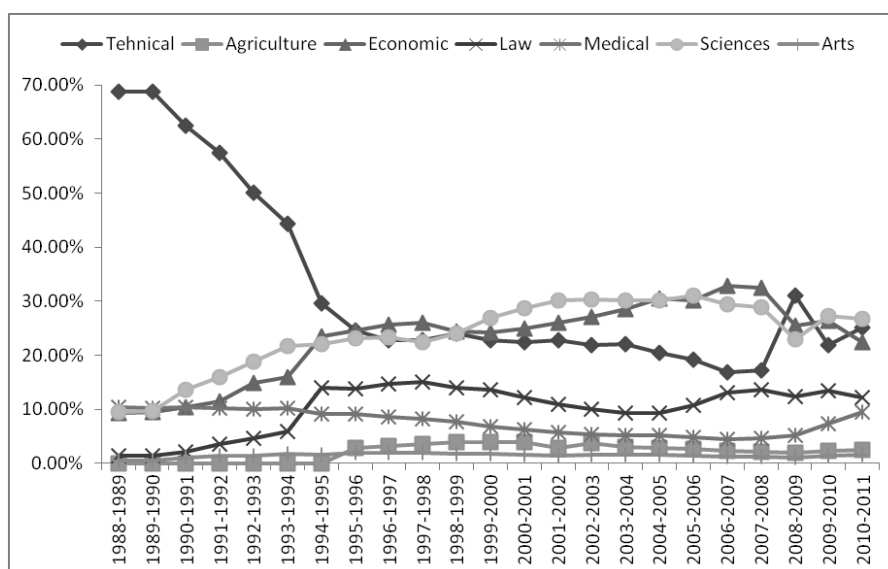


Analyzing these graphs we find that private education has an important share in the total number of students, the proportion reaching a peak in the 2008-2009 academic year when about 45% of students were studying in private universities in Romania. This share has declined in recent years due to the decreasing number of students in private universities mainly due to the demographic phenomena and economic crisis that led to lower incomes, and greatly affected the possibility of paying tuition fees.

The endowment of higher education has had its own development but not at the same rate with the number of students. Thus, if in 1990, Romania had 933 universities lecture halls, 2361 seminar rooms and 3994 laboratories in 2011 it had 3160 lecture halls, 4316 seminar rooms and 9456 laboratories. This means an increase of 3.3 times of the number the lecture halls, 1.82 times for the number of seminar rooms and 2.36 times for the number of laboratories. All these figures indicate an extensive development of higher education, development that can not be maintained on long-term. The increasing number of students is not correlated with teaching staff and the endowment. In fact, during the last two years there is already a declining number of students comparing to the peak in the 2008-2009 academic year, fall due to declining numbers of high school graduates and also to the economic crisis.

The share of students by type of specialization has undergone major changes since 1990 too. Thus, we present the percentage of students in technical education, agricultural, legal, economic, medical, academic, and arts education.

The percentage of students by the fields of study



(datasource : NIS)

There was a decrease in the number of students in technical education from about 68% in 1990 to 25% in 2011. Significant increases were recorded in economic education that reached 22% in 2011 (during the period 2006-2008 it reached a share of 32%) and law education that increased from 1.45% in 1990 to 12% in 2011. Medical education experienced a decrease from 10% in 1990 to only 4% in 2004-2005, and then returned to a share of 9% in 2011. Sciences education has steadily increased from 9% in 1990 to 31% in 2005-2006, and then recorded a decrease to 27% in 2011. Agricultural education and the arts have undergone constant evolution.

To see to what extent the increase in the number of students registered in the first year of study is due to the number of high school graduates we have applied a Granger causality test. We tested if the number of college graduates per 10,000 inhabitants is a Granger cause for the number of students in the first year of study per 10,000 inhabitants.

We tested three types of models: M1 - without constant M2 - model with constant and M3 - model with constant and trend. The results of applying the ADF test to detect the unit root for the model M1 (without constant) show that the data series of the number of high school graduates per 10,000 inhabitants and the number of students in the first year of study per 10,000 inhabitants are stationary in first order difference, that is, the two series are I(1). Applying the Engle-Granger test for detecting causality between the two

time series we obtained that the two series are not correlated. The following are the results of applying the ADF test and Engle-Granger test for the two data sets using GRET software:

Step 1: testing for a unit root in d_StudL

Augmented Dickey-Fuller test for d_StudL
including 2 lags of (1-L)d_StudL
sample size 18
unit-root null hypothesis: a = 1

test without constant
model: $(1-L)y = (a-1)*y(-1) + \dots + e$
1st-order autocorrelation coeff. for e: -0.023
lagged differences: $F(2, 15) = 0.498 [0.6172]$
estimated value of (a - 1): -0.571643
test statistic: $\tau_{nc}(1) = -1.8507$
asymptotic p-value 0.06122

Step 2: testing for a unit root in d_ElevL

Augmented Dickey-Fuller test for d_ElevL
including 2 lags of (1-L)d_ElevL
sample size 18
unit-root null hypothesis: a = 1

test without constant
model: $(1-L)y = (a-1)*y(-1) + \dots + e$
1st-order autocorrelation coeff. for e: -0.007
lagged differences: $F(2, 15) = 0.243 [0.7877]$
estimated value of (a - 1): -1.3293
test statistic: $\tau_{nc}(1) = -3.29488$
asymptotic p-value 0.0009638

Step 3: cointegrating regression

Cointegrating regression -
OLS, using observations 1991-2011 (T = 21)
Dependent variable: d_StudL

	coefficient	std. error	t-ratio	p-value
d_ElevL	0.338466	0.336794	1.005	0.3269

Mean dependent var	2.137656	S.D. dependent var	12.31508
Sum squared resid	2978.762	S.E. of regression	12.20402
R-squared	0.048070	Adjusted R-squared	0.048070
Log-likelihood	-81.82249	Akaike criterion	165.6450
Schwarz criterion	166.6895	Hannan-Quinn	165.8717
rho	0.627342	Durbin-Watson	0.753854

Step 4: testing for a unit root in uhat

Augmented Dickey-Fuller test for uhat
including 2 lags of (1-L)uhat
sample size 18
unit-root null hypothesis: $a = 1$

```

model: (1-L)y = (a-1)*y(-1) + ... + e
1st-order autocorrelation coeff. for e: 0.006
lagged differences: F(2, 15) = 0.901 [0.4272]
estimated value of (a - 1): -0.638876
test statistic: tau_nc(2) = -2.14803
asymptotic p-value 0.184

```

From these results we conclude that there is no Granger causality between the number of high school graduates and the number of students in the first year of study per 10,000 inhabitants.

Conclusions

Higher education in Romania has undergone major changes since 1990. In the last 23 years we have witnessed a dramatic increase in the number of students but this was not accompanied by a corresponding increase of the endowment of the higher education system and the teaching staff. Immediately after 1990 the first private universities have appeared and they have a significant share of the number of students. Thus in the 2008-2009 academic year, approximately 45% of students were studying in private universities in Romania. The structure on fields of education has changed greatly, economic and law education having significant increases while the technical education experienced a major decrease in the number of students. The teaching staff also increased, but not with the same rate as the number of students. Also the endowment of higher education has grown at a rate lower than the number of students. Engle-Granger causality test application led us to the conclusion that

there is no causal relationship between data series representing the number of high school graduates and the number of students in the first year of study per 10,000 inhabitants. All these observations lead to the conclusion of an extensive development of higher education that can not be sustained on long term. Moreover, since 2009, we record a decrease in the number of students due to both the economic crisis and demographic phenomena.

Bibliography

- Andrei, T., Teodorescu, D., Oancea, B., Iacob, A. (2010), Evolution of higher education in Romania during the transition period, *Procedia - Social and Behavioral Sciences*, Volume 9.
- Andrei, T., Teodorescu, D., Oancea, B., (2010), Characteristics of higher education in Romania during transition, *Procedia - Social and Behavioral Sciences*, Vol.2 issue 2.
- Andrei, T., Lefter, V., Oancea, B., Stancu, S. (2010), "A Comparative Study of Some Features of Higher Education in Romania, Bulgaria and Hungary", *Romanian Journal of Economic Forecasting*, 2010, volume 13 issue 2.
- Andrei, T., Teodorescu, D., Bourbonnais, R., Oancea, B. (2009), „A Simultaneous Equation Model for Estimating Corruption in Higher Education”, *Acta Oeconomica*, Vol. 59 (4).
- Barro, Robert J. (2002), "Education as a Determinant of Economic Growth." Edward P. Lazear (ed.) *Education in the Twenty-first Century*, Palo Alto, The Hoover Institution.
- Barro, Robert J. and Sala-i-Martin, Xavier. (1995). *Economic Growth*. McGraw-Hill, New York.
- McMahon, W. (1999), "Education and Development-Measuring the Social benefits", Oxford University Press.
- Teodorescu, D, Andrei, T. (2009) „Faculty and Peer Influences on Academic Integrity: College Cheating in Romania”, *Higher Education*, Springer, 57(3).