

The (not so)perfect match between the university graduates and the labor market

Anca Tamaş¹

The aim of the paper is to assess the matching between the universities graduates supply and the labor market demand and to identify potential solutions to challenges universities have to face on the global educational market.

Design/methodology/approach-statistical analyze and econometric methods using SPSS, E Views to identify the factors influencing the number of students, the correlation between the number of university graduates and the number of jobs by activity field; the Granger test was used to identify causality; quantitative methods.

Findings-the number of students is influenced by the number of universities, GDP per capita, the number of high school graduates; there is a mismatch between the number of university graduates and the number of available jobs on the labor market. There is no Granger causality between the number of high school graduates and the number of enrolled students.

Practical implications-optimizing the correlation between economic graduates and available jobs.

¹ **Anca Tamaş**, PhD Student, Bucharest University of Economic Studies, Romania, e-mail: anca.tamas@rei.ase.ro

Originality/value-contributing to lower the informational asymmetry between the educational market and the labor market.

Limitations-the proposed solutions have not been testing yet.

Keywords: university graduates, labor market

JEL Classifications: A2, I25, O 15

Motto: "The best way to predict the future is to invent it."²

The theoretical framework and literature review

The future of Europe seen from outside

In January 2012, HSBC Global Research released a report "The World in 2050", coordinated by Karen Ward, senior global economist. The forecast for economies is as follows:

- a group of countries with a low starting point and fast growth potential, more than 5% on average, from Europe (only Ukraine and Serbia are mentioned in this group)
- a second group of countries with strong perspectives, but a higher starting point, with growth between 3% and 5% on average, we can find here Romania, Czech Republic, Hungary, Croatia, Bulgaria, Lithuania, Latvia, Cyprus from Europe
- a final group include developed economies with a stable growth of less than 3% on average and we may find here the rest of European countries, included all the developed countries and the European leading economies

Therefore, a relative decline of European economies is forecasted and a new economical world order emerge.³

1. Quote from Alan Kay, computer scientist

2. Ward, K., 2012. *The world in 2050; From the Top 30 to the Top 100*, HSBC Global Research. Available at <https://www.google.ro/search?scient=psy-ab&site=&source=hp&q=Ward%2C+Karen%2C+%E2%80%9CThe+world+in+2050%E2%80%9D%2C+&btnK=C%4%83utare+Google> [Accessed 4 September 2014]

The future of Europe seen from inside

In October 2011, a group of experts released a report called “Global Europe 2050” for the European Commission. Three possible scenarios were identified:

Nobody cares-economic growth remains low, the distance between the EU economy and the world leading ones increase, the political influence decrease, EU accounts for 15% of the world GDP, compared to 29% in 2010.

EU under threat-EU heads to disintegration due to civil wars at its borders and one or two withdraws of the leading member states, EU accounts for 15% of the world GDP, compared to 29% in 2010.

EU renaissance-EU is enlarged and its economic, political, fiscal and military integration is consolidated and productivity increase, EU accounts for 17% of the world GDP, compared to 29% in 2010.⁴

Considering all these, the future looks a bit scary for Europeans, but there are good news and bad news. The bad news is we don't know how the Europe's future looks like and the good news is we know the ones who will make the future of Europe: the pupils that are about to attain schools. Therefore, we might shape the future by shaping the future's makers.

Europe in the neighborhood of technological frontier

European growth has been disappointing for the past 30 years, remaining persistently lower than US economy. There is now much evidence that this situation is closely linked to the state of innovation and higher education in Europe.

Productivity growth can be generated either by imitation or by frontier innovation, with innovation becoming increasingly important for growth as countries get closer to the world technology frontier.

3. https://ec.europa.eu/research/social-sciences/pdf/policy_reviews/global-europe-2050-report_en.pdf, [Accessed 17 June 2014]

Investment in primary and secondary education is more likely to make a difference for a country's ability to implement existing technologies, higher (particularly graduate) education investment has a bigger effect on a country's ability to make leading-edge innovations.

Thus, as Europe moves closer to the world technological frontier, it needs to rely increasingly on innovation as the main engine of growth, and therefore to invest more in higher education.⁵

Schooling as an economic success driver

Education is both a mean and an end to development. Changes in educational attainment are unidirectional, individuals can only move from the 'no education' status to primary, and on to secondary and possibly to tertiary; but can never revert to a lower status. The likelihood of an individual making the transition from one educational attainment level to the next highest is strongly dependent on the education of the parents.⁶

Robert J. Barro (1991), Jess Benhabib and Mark M. Spiegel (1994), Barro and Xavier Sala-i-Martin (1995), Sala-i-Martin (1997), and many others find schooling to be positively correlated with the growth rate of per capita GDP across countries. One more year of attainment is associated with 0.30% faster annual growth.⁷

All countries where fewer than 25% of the youth and adults have entered secondary school had a GDP per capita income below \$2000; whereas all countries where 80% or more of the youth and adults had entered secondary had a GDP per capita income higher than \$10,000.⁸

4. Aghion, P et al., 2008. *Higher aspirations: An agenda for reforming European universities*. [online] Bruegel Blueprint Series, Bruegel. Available at <http://www.econ.upf.edu/~mcolell/research/Bruegel%20blue.pdf>, [Accessed 20 September 2014]

5. Samir, KC et al., 2010. Projection of populations by level of educational attainment, age, and sex for 120 countries for 2005-2050. *Demographic Research*, 22(15), pp. 383-472, March

6. Bils, M. and Klenow, P., 2000. Does Schooling Cause Growth?, *American Economic Review*, 90(5), pp. 1160-1183, December

7. Wils, A., 2007. *Window on the Future: 2025 – Projections of Education Attainment and Its Impact*, [online] Foresight for Development. Available at

Schooling is considered one of the drivers of economic success, so many development strategies centered on expanding school attainment. After some years in which a number of countries expended schooling, but didn't close the economic gap, researchers found out that is quality that matters more than quantity. Therefore, what the students actually learn is far more important than the number of years in school, the personal cognitive skills acquired in school determine the wage level, so educational quality, meaning what people know, has effects on economic growth.

The allocation of talent matters for growth: countries with more engineering students grow faster and countries with more law students grow more slowly.⁹

A reform in education aiming an improvement from 400 points in Math and Science PISA tests on average (400 is considered minimum required) to 500 points in the same tests (500 is considered the mean for OECD countries) would take about 20 years to achieve and would determine an additional 5% growth in the GDP comparing to no reform in education and this growth would cover all primary and secondary school spending.¹⁰

The match between the higher education system and the labor market
There is a strong correlation between the higher education system and the labor market. The result of the expanding of the higher education system is an increase supply of tertiary graduates, but, in the same time, the labor market demand for more tertiary level qualification for

<http://www.foresightfordevelopment.org/sobipro/55/576-window-on-the-future-2025-projections-of-education-attainment-and-its-impact>, [Accessed 25 June 2014]

8. Murphy, K., Shleifer, A. and Vishny, R., 1991. The Allocation of Talent: Implications for Growth, *Quarterly Journal of Economics*, 106(2), pp. 503–530, May

9. Hanushek, E. and Wößmann, L., 2007. *Education Quality and Economic Growth*, [online] The World Bank, Washington, DC. Available at http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/547664-1099079934475/Edu_Quality_Economic_Growth.pdf, [Accessed 4 September 2014]

the workforce, therefore the wage gap between the graduates and the non-graduates remains significant.

In a paper commissioned by the Education and Training Policy Division, OECD, for the Thematic Review of Tertiary Education in January 2007,¹¹ there have been identified some of the risks: more and more young people do not pursue tertiary education and when they do, they are pursuing areas with low returns, such as Arts and Humanities, existence of a skill mismatch between the university supply and the labor market demand, a shortage of science and technology graduates leading to a negative impact on productivity growth and R&D. Some of the solutions found by the authors are: better information available for students before pursuing the higher education on study opportunities as well as on returns of the higher education, including forecasts on labor demand by the time of their graduation; the tuition fees and the bursaries should be differentiated by the field of the education, encouraging more people to pursue fields with high returns and potential high demand; increasing the employer-provided training; educational loans for talented young people from poor areas.

Universities' role

Universities are already drivers for national development and about to become themselves businesses due to international students they enrolled. There are roughly 3300 universities in EU and many of them award post graduates degrees and do their best to conduct research and attract funds for research. In US, there are 7018 universities, of which only 1640 offer Master programs and only 614 Doctoral programs.¹²

10. Machin, S and McNally, S., 2007. *Tertiary Education Systems and Labor Markets*, [online] Tertiary Review. Available at <http://www.oecd.org/edu/innovation-education/38006954.pdf>, [Accessed 23 June 2014]

11. <http://www.bing.com/search?q=US+National+Center+for+Education+Statistics&qs=n&for=m=QBRE&pq=us+national+center+for+education+statistics&sc=1-43&sp=->

Lancrin (2006) identified six scenarios for Universities:

1) Tradition:

- pursue teaching and research
- address to a small share of youth population
- low involvement with the private sector
- government plays a major role in funding and managing
- lifelong learning and the e-learning is outside the university sphere

2) Entrepreneurial:

- pursue research, teaching and community service
- address to a larger share of young people
- strong links with local economy
- a variety of funding sources and greater autonomy
- lifelong learning within universities with lower status

3) Free market:

- universities become specialized by function, field and audience
- more polarization in the status of a faculty and a global super-elite of universities
- funding will be mostly of tuition fees, therefore the competition for students will increase
- research gets from universities to R&D centers

4) Lifelong learning and open education:

- access for all ages
- most of the research in the elite universities or even outside the higher education system
- more teaching orientated, short courses, e-learning, distance learning
- corporate universities become more influent

5) Global network of institutions:

- the learners will design their degrees and define their courses from the available ones

- strong development of e-learning
- the content become more standardized
- the research is mainly outside the higher education system

6) Disappearance of universities:

- people will learn throughout their life
- learning takes the model of open course education
- formal assessment of credential will be in special assessment bodies
- research will be in R&D research centers¹³

We can find evidence for almost all of the scenarios: elite universities, as well as traditional ones, specialized universities, research carried out inside as well as outside the higher education system, development of e-learning and distance learning, open courses like MOOC or COURSEERA, lifelong learning programs.

These are not the only possible scenarios identified for the future universities, two researches from Australia found out five scenarios:

1. The public academic champions, the MOOC, has a lot in common with the Lifelong learning and the open education model showed before.
2. Leading knowledge creation-is somehow similar to previous Free market, with only a small share of traditional universities focused on research and all the rest focused on teaching.
3. Responsive knowledge creation-similar to entrepreneurial model, the universities are split in pure and applied ones.
4. Collaborative partners for local sustainability-more like Global network of institutions, more like regional universities dispersed in campuses, universities give up at their own identity for the regional identity.
5. Innovation think tanks for hire(project based clusters)-a mixed of traditional and universities disappearance, a global elite of traditional

12. Vincent-Lancrin, S., 2004. Building futures scenarios for universities and higher education. An international approach, *Policy Futures in Education*, 2(2), pp. 245-263

universities involved in think tanks with many universities shutting down some courses and some faculties.¹⁴

How could the European universities close the gap to the US ones? Using competition between students, between universities at regional, national and European level. Tuition fee should be introduced, because students do not value free goods, premium wage should be awarded for excellence, the available funds for research should be focused on top universities.¹⁵

Returns to education and over-education

Returns to education vary across population by factors such as school quality and parental education. Introducing price competition might drastically affect higher education, with the introduction of fee differentials, students are going to become more exigent customers. Thus, while average quality is likely to increase, the heterogeneity between institutions may also augment, with some institutions deciding to compete on lower price and others on higher quality.¹⁶ The choice of subject provided by universities may also be affected with less popular courses being dropped out in favor of high revenue courses. Hoxby (1997) demonstrates that these market mechanisms took place in the US and are responsible for higher average quality, a homogenization of the students within institutions and a greater variation in the quality of the degree provided between institutions. Hoxby and Terry (1999) note that variations in the returns to college education have significantly increased in the US as the education systems became more market oriented. The authors also show that the

13. Blass, E. and Hayward, P., 2014. Innovation in higher education; will there be a role for “the academy/university” in 2025?, *The European Journal of Futures Research*, 41(2), pp. 41-50, May

14. Alesina, A. and Giavazzi, F., 2008. *The Future of Europe: Reform or Decline?* [online] Available at <http://www.amazon.com/The-Future-Europe-Reform-Decline/dp/0262512041>, [Accessed 28 June 2014]

15. Card, D., 1999. The Causal Effect of Education on Earnings, *Handbook of Labor Economics*, 3, pp. 1801-1863

increasing matching of students' ability to college quality is responsible for 40% of the explained growth in the dispersion of returns to higher education.¹⁷

The mismatch between the employers demand and the employees offer

Despite more people looking for work, employers in Europe cannot find the skills they need. Across the EU, a quarter of young people under 25 in the labor market are unemployed, the highest level in any region except the Middle East/North Africa. Across most of the region, youth unemployment has risen significantly since the financial crisis hit in 2008. Employers everywhere report skills shortages. Young people will be in no position to compete for the projected expansion in job opportunities unless they can gain the necessary skills and that requires an increase in the number of fully funded higher education places.¹⁸

In the survey of the eight EU countries, one-third of employers said that lack of skills is causing major business problems, in the form of cost, quality or time; 74% of education providers were confident that their graduates were prepared for work, yet only 38% of youth and 35% of employers agreed.

Possible solutions:

To reduce the cost of courses, one solution is to break up degree programs into individual modules that focus on a particular set of skills, while still counting towards a degree or formal qualification. Each of these modules would be short(weeks or a few months) and

16. Chevalier, A. and Conlon, G., 2003. *Does it Pay to Attend a Prestigious University*. [online] CEE DP 33. Available at <http://cee.lse.ac.uk/ceedps/ceedp33.pdf> [Accessed 5 August 2014]

17. Birrell, B. and Rapson, V, 2006. *Clearing the Myths Away: Higher Education's Place in Meeting Workforce Demands*. [online] Centre for Population and Urban Research, Monash University, Dusseldorp Skills Forum. Available at <https://theaustralianpopulationresearchinstitute.files.wordpress.com/2015/01/birrell-rapson-oct-2006-higher-ed.pdf> [Accessed 15 September 2014]

self-contained, enabling students to combine and sequence them in the order that makes most sense for their career aspirations. This model also enables young people to take a break in their studies to work for a period and then return and pick up where they left off.

Another option is to explore different ways of delivering learning for specific skill sets, such as on-line learning for teaching theoretical content and face-to-face for applied skills.

“Serious games” that mimic the workplace context, for example, are low-cost, low-risk ways for students to receive a personalized learning experience through repeated “play” of the game.¹⁹

The high risks of over-education

If young people who have worked hard to graduate from school and university cannot secure decent jobs and the sense of respect that comes with them, society will have to be prepared for outbreaks of anger or even violence.²⁰

Overeducated workers have worse career prospects than correctly allocated workers. This is in clear contrast to the results put forward by Sicherman(1991). Less successful people who work in jobs for which they are overeducated continue to be less successful in their careers than correctly allocated workers, while the opposite is true for undereducated persons.²¹

Over-education is temporary for any worker and can be seen as part of the career mobility.²²

18. McKinsey and Company, 2014. *Education to Employment: Getting Europe's Youth into Work*. [online] Available at <http://www.mckinsey.com/industries/social-sector/our-insights/converting-education-to-employment-in-europe> [Accessed 20 July 2014]

19. Mourshed, M., Farrell, D. and Barton, D. 2013. *Education to employment: Designing a system that works*. [online] Available at <http://www.mckinsey.com/industries/social-sector/our-insights/education-to-employment-designing-a-system-that-works> [Accessed 20 July 2014]

20. Büchel, F. and Mertens, A. 2000. *Overeducation, Undereducation and the Theory of Career Mobility*. [online] IZA DP No. 195. Available at <http://ftp.iza.org/dp195.pdf> [Accessed 9 June 2014]

21. Robst, J., 1995. Career mobility, job match, and over education, *Eastern Economic Journal*, 21(4), pp. 539–550, Fall

Overeducated workers are usually younger and have less on-the-job training than educated workers.²³

Labor force quality differences are important for growth; the differences are related to schooling and the quality has a causal impact on growth.²⁴

The returns to required schooling are about 6% for both men and women, while the return to surplus schooling is slightly less than half that amount. Both male and female workers with too much education for their jobs are less satisfied, as are women with too little education.²⁵

Employees' education and qualification is one barrier that might hinder the implementation of increased workforce diversity. They believe that most employees are not sufficiently competent to successfully work together with colleagues who have diverse professional, educational and cultural backgrounds.²⁶

To work in knowledge-based manufacturing employees increasingly need new *soft skills* that are generally associated with university education: teamwork, networking, intercultural literacy, interdisciplinary thinking, high worker autonomy and mobility/flexibility²⁷

The low value of the free goods

22. Sicherman, N., 1991. Over education in the labor market, *Journal of Labor Economics*, 9(2), pp. 101–122

23. Hanushek, E. A. and Kimko, D. D., 2000. Schooling, Labor Force Quality, and the Growth of Nations, *American Economic Review*, 90(5), pp. 1184–1208, December

24. Hersch, J., 1991. Education match and job match, *Review of Economics and Statistics*, 73(1), pp. 140–144, February

25. ManVis, 2005. *ManVis Report 3 – Integrating Diverse perspectives into Pan-European Foresight*. [online] Delphi Interpretation Report, Manufacturing Visions. Available at http://manufacturing-visions.org/download/Final_Report_final.pdf [Accessed 25 June 2014]

26. van der Zee, F. and Brandes, F. 2007. *Manufacturing futures for Europe—a survey of the literature*, [online] TNO, the Netherlands. Available at http://www.gospi.fr/IMG/pdf/future_manufacturing_europe_literature_final_report_en.pdf [Accessed 30 June 2014]

In a mass access system with no selection and high youth unemployment rates, it may be quite rational for a student to sit around for a year or two before dropping out. But this is hardly an efficient use of public resources. Perhaps not surprisingly, there appears to be a link between the length of a course and the percentage of students successfully graduating. On average in OECD countries, 32% of people at the normal age of graduation have completed higher education courses lasting from three to five years.

Drop-out rates are much lower than average in countries like the UK, where there is a selective entry system or in courses elsewhere in Europe, which limit the number of participants. It is all about commitment. Most institutions with high international reputations operate some kind of selection process for students. By contrast, many European universities have to accept what they are given. At the same time, some countries, such as the Netherlands, Finland, Sweden and the UK, are allocating a greater portion of funds on the basis of performance. A growing number of member-states are discussing the introduction of tuition fees. European universities are also increasingly willing to compete for students, particularly for lucrative fee-paying overseas students.²⁸

The arguments in favor of tuition fees are not just about raising extra money. People do not value free goods or services. Finland, Norway and Sweden, all grant equal access to each others' students, while, at the same time, allowing money from the country of residence to follow the student. Each country pays an annual sum for students studying in one of the other countries (approximately S3,000 in 1999).

27. Lambert, R. and Butler, N. (2006). *The future of European Universities: Renaissance or Decay?*. [online] Centre for European Reform. Available at https://globalhighered.files.wordpress.com/2009/09/p_67x_universities_decay_3.pdf [Accessed 20 July 2014]

GMAC suggests that a *balance of education payments system*, based on the Nordic approach, could be established at a European level.²⁹

The aim of the paper is to assess the matching between the universities graduates supply and the labor market demand and to identify potential solutions to challenges universities have to face on the global educational market.

2. Major changes in tertiary education in Romania

After 1990, not only the number of students and the number of universities increased, but there are significant changes related to the study fields.

In the table 1 I will compare the number of students in higher education in two periods: 1990-1995 and 1996-2008 by the field of education.

Table 1

**The number of students in higher education in two periods:
1990-1995 and 1996-2008 by the field of education**

Field of education/period	1990-1995	1996-2008	Change
Engineering & manufacturing	47078	47697	+0.01
Energy & electronics	27361	103645	+2.78
Business & economic studies	27313	502988	+17.41
Medicine	19485	77196	+2.96
Law	13341	175590	+12.16

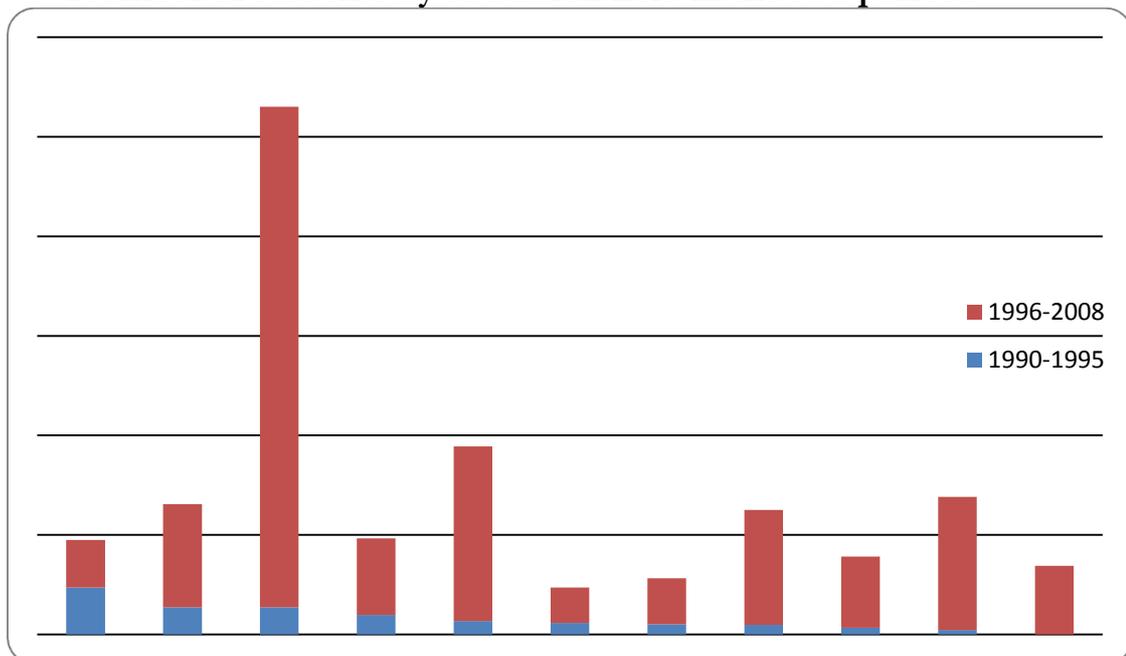
28. Lambert, R. and Butler, N. (2006). *The future of European Universities: Renaissance or Decay?*. [online] Centre for European Reform. Available at https://globalhighered.files.wordpress.com/2009/09/p_67x_universities_decay_3.pdf [Accessed 20 July 2014]

Construction & architecture	11599	35573	+2.06
Math & Science	10248	46228	+3.51
Humanities	9459	115769	+11.23
History & Philosophy	6809	71436	+9.49
Pedagogy	4497	133628	+28.71
Political Sciences	0	68787	

Source: INS Romania

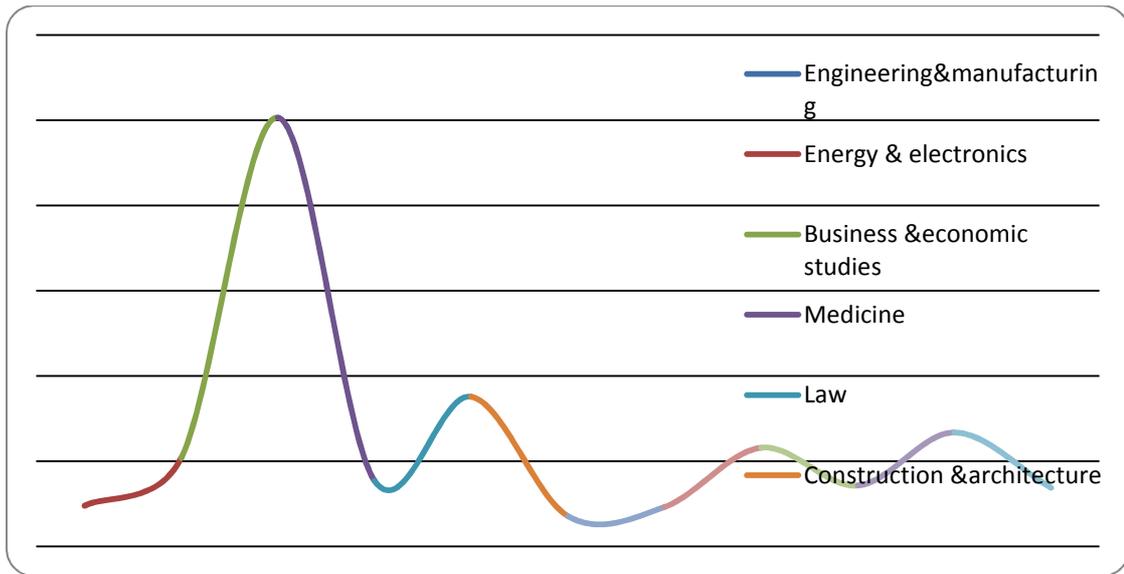
Figure 1

Number of students by education field in the two periods



Source: author's figure, dates from INS Romania

Figure 2
Number of students in 1996-2008 period by education field

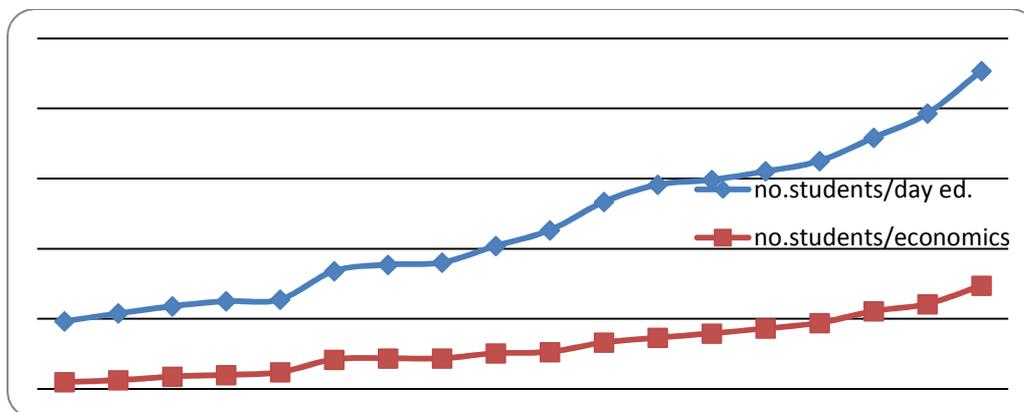


Source: author's figure, dates from INS Romania

The number of students in economy steadily increase in Romania 15 times from 1990 to 2007 from 20000 to almost 300000 and the ratio of economic students tripled in the same period from 10% to 30%. The only problem is that for about ten years, between 1994 to 2004, one in four students studied economy, coming up to one in three students by 2008, therefore the labor market will be saturated for medium time. But is this any different comparing to EU? Not really, because across the EU-28, one third(33.3%) of the students in tertiary education were studying social sciences, business or law in 2011, the second largest number of students by field of education was in engineering, manufacturing and construction-related studies which accounted for 15% of all students in tertiary education. An analysis of the number of graduates by field of education shows that 34.8% had studied social sciences, business and law; this [share](#) was higher than

the equivalent share(33.3%) of tertiary education students still in the process of studying within this field, suggesting that less students had started this type of study in recent years, or that either drop-out rates or average course lengths were higher in other fields.³⁰

Figure 3
Number of students daily educated compared to number of students in business and economics

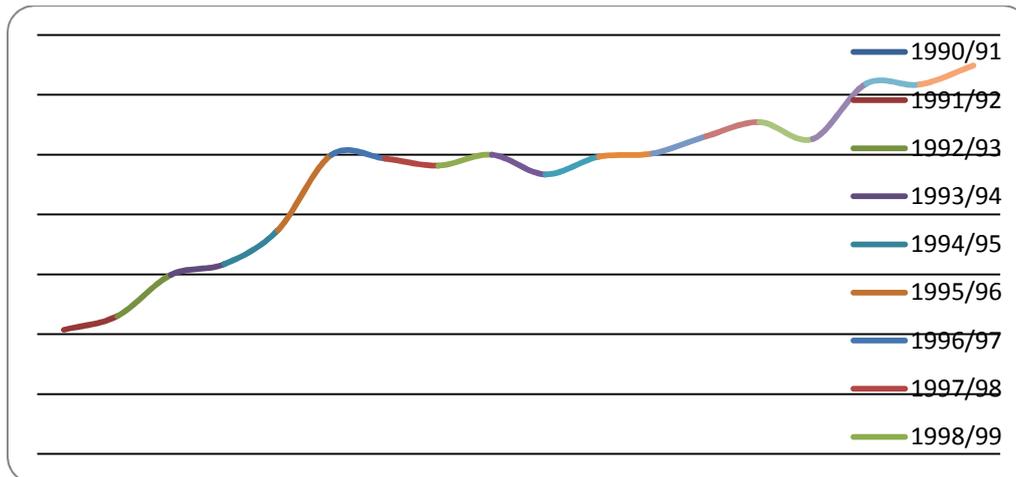


Source: author's figure, dates from Eurostat

29. http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Tertiary_education_statistics, [Accessed 9 August 2014]

Figure 4

Evolution of the ratio of economic students



Source: author's figure, dates from Eurostat

For Bucharest Academy of Economics, the link with the labor market is a strong one, according to the annual report of the late years, at least 90% found work in short time (between 3 to 6 months), although between 50 to 56% are working in the area they were trained.³¹

I tried to identify the factors influencing the number of students. I have used as predictors number of high school graduates (HSG), number of universities (NU) and the GDP per capita (GDP/C\$). The dependent variable is the number of students (NSDE). The data from table 1 are extracted from UNESCO statistics³². I used regression from SPSS to analyze three models: the first one using just HSG as predictor, the second one using HSG and NU as predictors and the third one using HSG, NU, GDP/C\$ as predictors. The outputs are as follows:

30. http://ca.ase.ro/Media/Default/Page/Raportul%20anual%20al%20Rectorului%20ASE_2013.pdf, [Accessed 5 September 2014]

31. www.uis.unesco.org, [Accessed 16 June 2014]

Model Summary^d

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. Change
1	,390 ^a	,152	,099	203060,497	,152	2,867	1	16	,110
2	,830 ^b	,688	,647	127176,759	,536	25,790	1	15	,000
3	,983 ^c	,966	,959	43535,448	,278	114,003	1	14	,000

a. Predictors: (Constant), HSG

b. Predictors: (Constant), HSG, NU

c. Predictors: (Constant), HSG, NU, gdp/C\$

d. Dependent Variable: nsde

We can see the correlation coefficient value is very high for the third model ($R=0,983$), high for the second model ($R=0,830$) and low for the first model ($R=0,390$). R squared shows what proportion of the variance is explained by the model and, again, the third model explains 96.6% variance of NSD, the second model and just 15.2% for the first one. Fisher test shows significance for models 2 and 3.

		nsde	HSG	NU	gdp/C\$
Pearson Correlation	nsde	1,000	,390	,708	,845
	HSG	,390	1,000	-,058	,657
	NU	,708	-,058	1,000	,270
	gdp/C\$,845	,657	,270	1,000
Sig. (1-tailed)	nsde	.	,055	,001	,000
	HSG	,055	.	,409	,002
	NU	,001	,409	.	,139
	gdp/C\$,000	,002	,139	.
N	nsde	18	18	18	18
	HSG	18	18	18	18
	NU	18	18	18	18
	gdp/C\$	18	18	18	18

NSDE is highly correlated with GDP/C\$ (0,845) and with NU(0,708), which supports the models 2 and 3 as well. The ANOVA shows that models 2 and 3 are more efficient considering the F values and the significance.

ANOVA^d

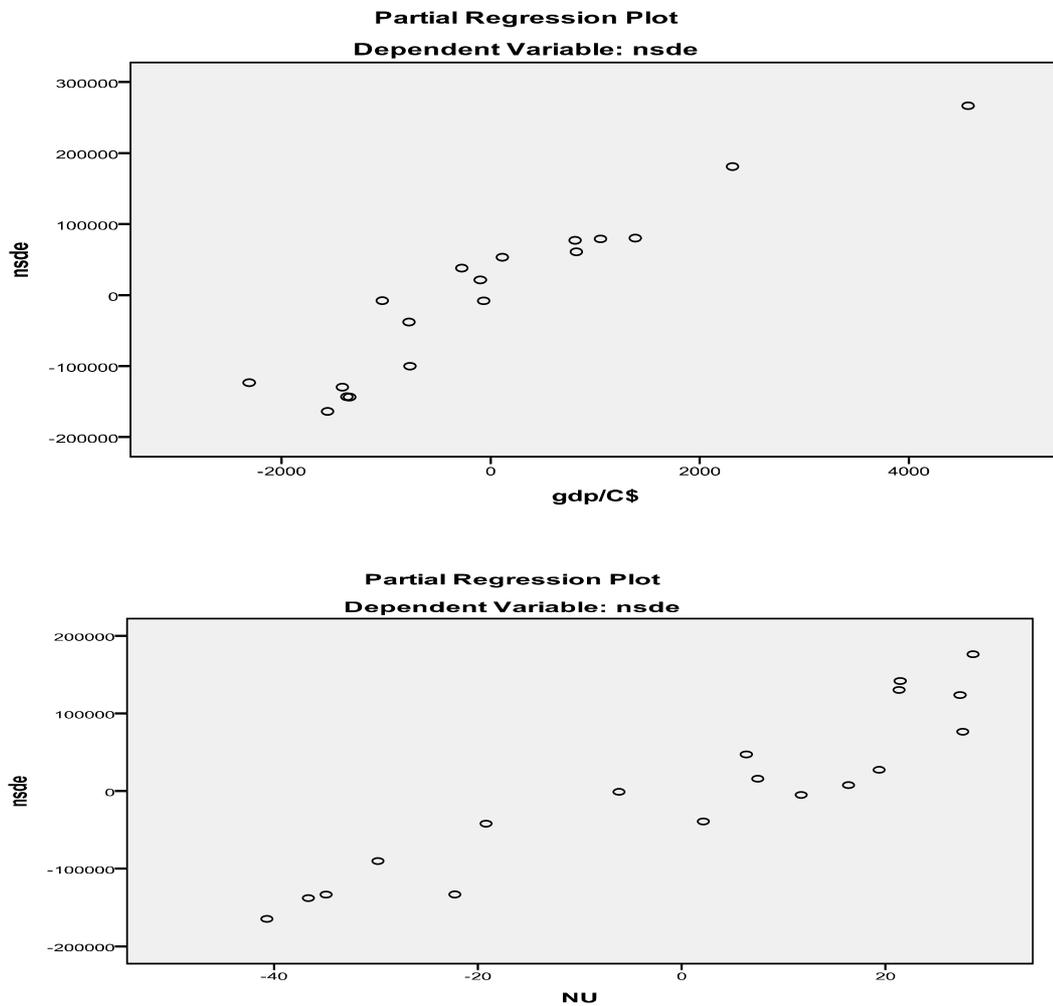
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,182E11	1	1,182E11	2,867	,110 ^a
	Residual	6,597E11	16	4,123E10		
	Total	7,779E11	17			
2	Regression	5,353E11	2	2,677E11	16,549	,000 ^b
	Residual	2,426E11	15	1,617E10		
	Total	7,779E11	17			
3	Regression	7,514E11	3	2,505E11	132,151	,000 ^c
	Residual	2,653E10	14	1,895E9		
	Total	7,779E11	17			

a. Predictors: (Constant), HSG

b. Predictors: (Constant), HSG, NU

c. Predictors: (Constant), HSG, NU, gdp/C\$

d. Dependent Variable: nsde



I couldn't find any official statistics or forecast regarding the number of economists needed in the Romanian economy, so I wanted to find out if there is a Granger causality between the number of high school graduates(HSG) and the number of students(NSDE). Both series are stationary, NSDE at 5% significance level and HSG at 10% significance level. Since the probability is 0.07 we cannot reject the null hypothesis, therefore there is no Granger causality between the number of high school graduates and the number of students at a

confidence level of 95%. Therefore, the dynamics of the students' number cannot be predicted considering the number of high-school graduates.

Pairwise Granger Causality Tests

Date: 07/14/14 Time: 16:40

Sample: 1 20

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
NOSTUDENTS does not Granger Cause HIGHSCHOOL	18	2.28223	0.1414
HIGHSCHOOL does not Granger Cause NOSTUDENTS		3.25723	0.0713

The next thing I wanted to find out is if the business and economics are still leading in future students' preferences and if there is a correlation between the high school profile and the study field they would apply for.

I gave 500 questionnaires during a week on university fairs in Bucharest, the most developed region of Romania and in Vaslui, the least developed region of Romania. Out of 500 questionnaires, 213 were fully completed, therefore used in analysis. The profile of the respondents is presented below:

Table 2

The profile of the respondents

	Count	Percent
Gender		
Female	121	56,80%
male	92	43,20%
Age		
< 18	82	38,49%
18	56	26,29%
>18	75	32,22%
Family income		
Below average	20	9,38%
average	151	70,89%
Over average	42	19,73%
English level		
A1	29	13,61%
A2	31	14,55%
B1	54	25,36%
B2	59	27,69%
C1	33	15,49%
C2	7	3,28%

Source: author's table

I found out that 151 out of 213 respondents (70.89%) are interested in business, economics, law, management, administration. This can be explained by a shortage of information regarding the demand of the labor market. According to Manpower, the most difficult to find on the labor market in Romania for the previous year are:

- 1) Qualified workers
- 2) Engineers
- 3) Not-qualified workers

- 4)Managers and leaders
- 5)Accounters and financial experts
- 6)Sellers
- 7)Technicians
- 8)IT personal
- 9)Machinery operators
- 10)Cookers³³

To find out if there is a correlation between the respondents' high school profile and the field they intend to study I applied correspondence analysis in SPSS. This is the output:

Summary

Dimension	Singular Value	Inertia	Chi Square	Sig.	Proportion of Inertia		Confidence Singular Value	
					Accounted for	Cumulative	Standard Deviation	Correlation
1	1,000	1,000			,141	,141	,000	,155
2	1,000	1,000			,141	,282	,000	
3	,870	,757			,107	,388		
4	,846	,716			,101	,489		
5	,821	,674			,095	,584		
6	,724	,525			,074	,658		
7	,699	,489			,069	,727		
8	,633	,401			,056	,783		
9	,572	,327			,046	,830		
10	,527	,277			,039	,869		
11	,500	,250			,035	,904		
12	,463	,214			,030	,934		
13	,427	,183			,026	,960		
14	,385	,148			,021	,981		
15	,337	,114			,016	,997		
16	,154	,024			,003	1,000		

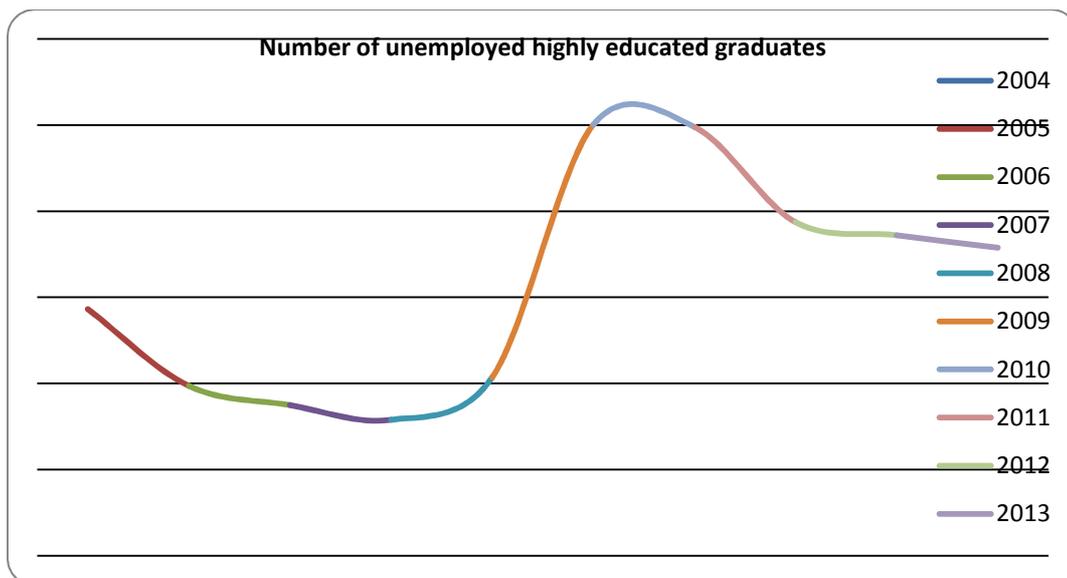
32. <https://candidate.manpower.com>, [Accessed 16 September 2014]

Total	7,098	1462,211	,000 ^a	1,000	1,000		
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a. 952 degrees of freedom

The value of the chi-square statistic is 1462.211 associated with a .0001 probability. The computed value of chi-square is greater than the critical value, 1056.4.³⁴ In this case, I reject the null hypothesis and there is no correlation between the high school profile and the study field the respondents applied for.

Figure 5
Number of unemployed highly educated graduates



Source: author's figure, dates from Eurostat

33. https://extension.usu.edu/evaluation/files/uploads/Start%20Your%20Engine/Study%20the%20Route/Analyze%20the%20Data/Interpreting_Chi_Square_Printouts.pdf [Accessed 9 August 2014]

As we can see, the number of unemployed HE graduates in Romania has a peak in 2009-2010, than is decreasing, but the percent out of the total of unemployed is getting higher. The peak can be explained both by the beginning of the crisis and by the fact that, in 2008, we actually had two cohorts of graduates, the last pre-Bologna and the first Bologna. The labor market is still not recovered after crisis, and the HE unemployed are either recently graduates, with no or little work experience or over 45 years old, considered overeducated and, therefore, too expensive. In Romania, there are around 1000 vacant jobs for HE graduates and over 100000 young people striving for them.³⁵ If we want to compare the Romania situation with the EU perspectives, two monitors might help us: The European Vacancy Monitor and the European Jobs Monitor, both of them part of the 'Monitoring Labor Market Developments in Europe' project, launched in 2010 by European Commission. The objective of this project is to increase labor market transparency for all stakeholders who need information about recent developments on the demand side of the labor market. Over the longer term, between the second quarters of 2008 and 2013, total hirings in the EU26 countries fell by -16%. In the countries from North and center of Europe, high-skilled occupations are strongly represented, as opposed to the countries in South and East of Europe, where the skilled manual occupations dominated. Over a longer period, the changes in hiring between the second quarters of 2013 and 2008 confirm the labor market resilience of those with higher levels of educational attainment. Employers will be faced with hiring young recruits with little general and specific work experience and this would then create a low productivity scenario that would hold back development.³⁶ The two jobs with the greatest employment growth were well-paid jobs, in knowledge-intensive

34. <http://www.cnfpa.ro/> [Accessed 5 July 2014]

35. European Vacancy Monitor, 2014. *Vacancies, Hirings and Job Prospects*. European Commission, no. 12, February

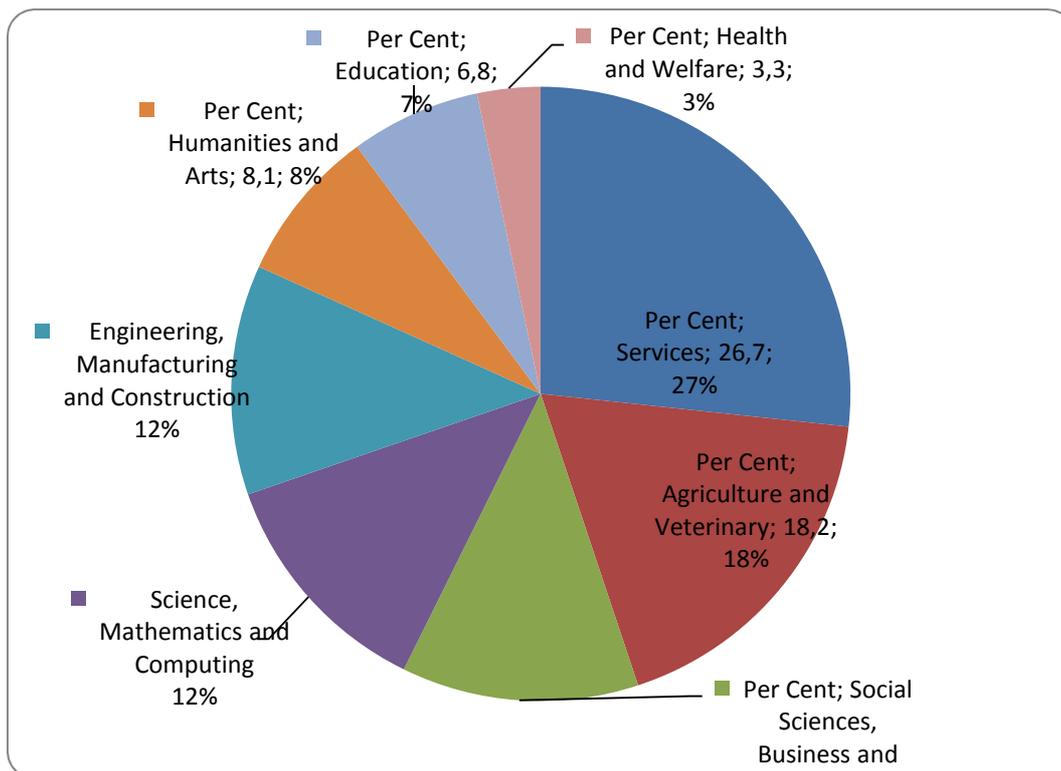
services: health professionals in the health sector and ICT professionals in computer programming, consultancy and related activities. Although there has been a marked increase in the share of third-level graduates in the workforce, the employment level of younger university graduates (aged under 30 years) has decreased.³⁷ The conclusion from both monitors is better job prospects are strongly and positively correlated by high level of worker's education.

In Romania, there is a mismatch between the education and occupation, meaning young employees over educated in low skilled and low paid jobs, combined with high levels of unemployment among young graduates, over 25%. As for the level of the mismatch, according to Eurostat data, the sectors and the percents are as follows.

36. European Jobs Monitor, 2014. *Drivers of recent job polarization and upgrading in Europe*, European Monitoring Centre on Change

Figure 6

Education and occupation mismatch



Source: author's figure, dates from Eurostat

Conclusions:

The Romanian higher education expanded faster than the labor market, this means the number of students was not correlated with market demand or market perspectives. There is a low correlation between the number of high school graduates and the number of students and there is no causality between these numbers. If we combine the number of high school graduates with the number of universities, the correlation improves significantly and if we complete

the model adding the GDP per capita, the correlation is very strong, over 0.9 and over 96% of the variance is explained.

The number of students in Economics, Law, Political Sciences increased for more than 10 times in the period 1996-2008. The combined mismatch between education and occupation is higher in Services sector as well as in Social Sciences, Business and Law, meaning in these sectors we had a high percent of over educated employees and that many young graduates cannot find a job to match their studies and are forced to take any job they can. Even so, over 70% of the potential students are interested in Economics, Business, Law, Administration, with low correlation between the profile of their high school studies and the university studies.

No information is available for the high school graduates regarding the dynamic and the perspective of job availability and vacancies by the time of their graduation. The demand in Romanian labor market is mainly for low skills and low-paid jobs, but these jobs usually are correlated with low productivity and this may affect the development.

Considering all these, what should be done?

At personal level: to achieve the highest level of education to fit personal abilities, to achieve as much practical experience as possible, to consider lifelong learning as a way of living.

At university level: for the most wanted programs from Bachelor to Doctorate degree to introduce some selection form for the students; to diversify the educational offer including online courses, including Serious Games to simulate practical work activities, to introduce international programs and to strive for quality; to introduce tuition fees according to students' performance.

At national level: to improve and extend the information for potential students, including a forecast for potential vacancies by the time of their graduation available in the country and in Europe, including statistics regarding the ratio of employment for the graduates; to concentrate the money to the top universities.

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