

# ECONOMIC VALUE OF HIGHER EDUCATION

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## 1. SUMMARY

A regular expectation in the European guidelines and other common documents for the last decades has been the general raising of the educational level of the citizens and the reduction of unskilled ones. Raising the rate of people between 30-34 having a diploma to 40 per cent is among the referential values defined by the European Union. The authors aim to estimate the additional, numeric effects of the application of employees with a higher education on the Hungarian GDP. As a result of the model based on the methods given it can be concluded that raising the rate of employees between 30-34 having a diploma until 2020 can contribute to the rise of the Hungarian GDP by approximately 1.360 billion HUF during the planning period of 2010-2020. The positive effects appear mostly at the small and medium sized enterprises because of the high rate of employment in them. [1]

## 2. INTRODUCTION

In the strategy of “Europe 2020” of the European Union, education and training are highlighted, as

they give the citizens skills and competences needed for the preservation of innovative features and competitiveness of the European society and economy, while they help the improvement of the social cohesion and reception.

A regular expectation in the European guidelines and other common documents for the last decades has been the general raising of the educational level of the European citizens and the reduction of unskilled ones. Raising the rate of people between 30-34 having a diploma (ISCED level 5-6)<sup>1</sup> to 40 per cent is among the referential values defined by the European Union. (Figure 1.)

Apparently, it has a very positive effect on productivity along with the production and output as well as the economic growth. The positive effect naturally affect all the participants in economy, but the small and medium sized enterprises can be highlighted, since their role in employment is considerable all over the European Union.

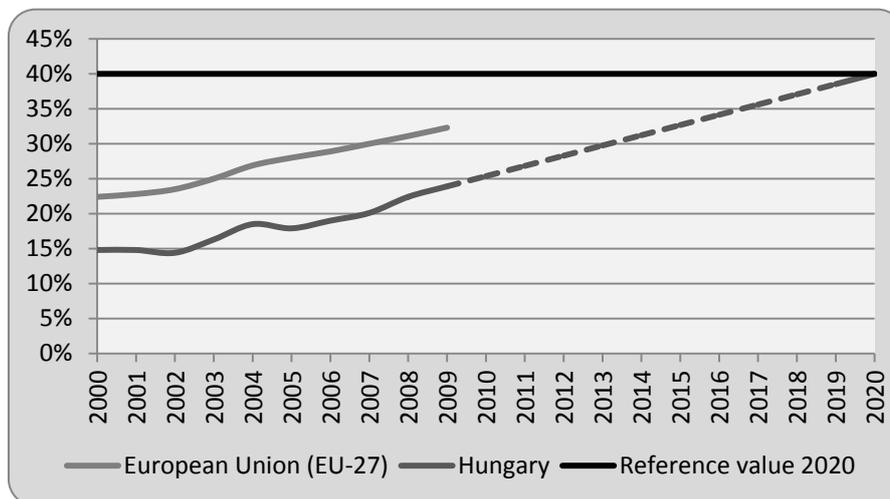


Figure 1.

Proportion and prognosis of 30-34 year olds having completed tertiary or equivalent education (level ISCED 5-6.) in Hungary and in the European Union (2000-2009, 2020) [3], own compilation

<sup>1</sup> International Standard Classification of Education, level 5-6: Accredited higher education, BSc, MSc, PhD, DLA

### 3. GOAL

The authors aim to estimate the additional numeric effects of the application of employees with a higher education on the Hungarian GDP. According to the supposition that the article is based on the higher education level of employees can considerably contribute to the increase of the GDP. The European guideline mentioned in the introduction and estimation given by the authors can be seen in Figure 1.

The rate of people with higher education in Hungary reached 24 per cent in 2009. Supposing a constant growth (approximately 1.5 per cent point annually) the expected 40 per cent reference value can be completed with a pace shown in Figure 1 by 2020. From the economic effects of increasing of the educational level, the authors examine the additional value creation generated by the employees; without regard on any other effects. The additional value creation comes from the expected increase of the productivity of employees with higher education. The wage difference respected by market is the measurement in the frames of the article. Supposedly, the employees who are more successful in value creation are rewarded with a higher wage by the market. The authors accept the positive correlation between the higher education and the growth of productivity, as the essence of labour market oriented trainings. They build their financial calculations based on it.

These positive effects can highly influence the sector of small and medium sized enterprises (for example: role in employment, higher improvement in the expansion of the rate of employees with higher education in contrary to the public sector and multinational companies).

### 4. MATERIAL AND METHODS

The basic data needed for the financial-mathematical evaluation are from Hungarian public institutions, the statistics of the Hungarian National Bank, and other reliable international secondary sources detailed in the "References".

Obtaining a higher education can be considered as an investment into the human capital. The individual expectedly profits from this investment for all of his active age. The authors apply by the NPV (Net present value) method to estimate this profit. The present value of this profit can be distributed into equal amounts for the planning period with the help of the appropriate mathemati-

cal method, namely the profit annuity<sup>2</sup> (PA). These amounts mean the annuity in different years available by continued studies. The effects on the production of the people with higher education can easily be defined with the help of annuity and analysing the appropriate labour statistics.

The well-known financial mathematic methods can be applied with small corrections to finish the profitability analysis. The net present value means the sum of the present value of initial expenditures and future cashflows. If the result is positive, the investment is worth realizing, since the sum of the present values calculated with the consideration of the discount rate exceeds the expenses of realization. Otherwise the correction with the discount rate means that the project is more profitable than other investment opportunities on the market.

In the case of corporate analysis a project risk estimation would be necessary to calculate the discount rate, but in our case – analysing individuals and education – the specification of a general reachable yield is acceptable.

The authors determined the alternative cost from the yield of Hungarian and European government bonds. For the first ten years (2011-2020) the average yield of Hungarian government bonds with appropriate maturity [4] and for the period after 2020, the average yield of AAA Euro-government bonds (2010) with 30-year maturity – published by the European Central Bank [5] – were applied.

The determination of the NPV grounds on the difference between the average salaries with different education levels. In Hungary, the average gross difference between the salaries of secondary- and higher-educated people was HUF 2.236.500 in 2010 [6]. Following assumptions and facts were taken into account in the calculation: the salary loss during the education, education fee of HUF 200.000/semester and 7 semester education time, the inflation (4 % in 2011 [7], 3,3 % in 2012 [8], 3% in and after 2013), retirement age of 65 years. After the authors' opinion the higher value creation ability coming from the higher qualification can be correctly estimated from the salary-difference, because the labour market acknowledges the better working ability exactly with higher salaries. The method also coincides with the logic of the regular estimation of GDP.

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<sup>2</sup> 
$$PA = NPV(n) \left[ \frac{(1+i)^n \times i}{(1+i)^n - 1} \right]$$

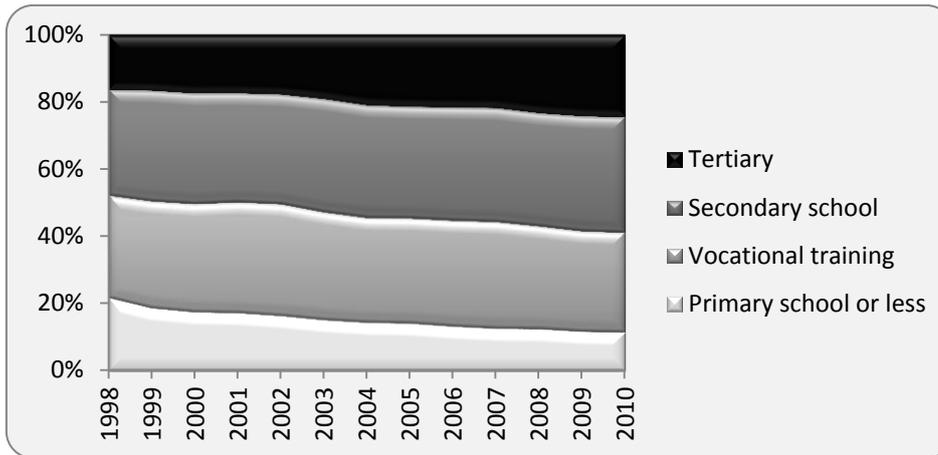


Figure 2.  
The ratio of people employed by highest level of education in Hungary (1998-2010) [9], own compilation

**5. RESULTS**

The European education level expansion (40% of 30-34 year old employed until 2020) could be a realistic target. Figure 2. confirms that, where the ratio of higher educated raised and the ratio of people with primary and secondary education did not change significantly in the period 1998-2010.

Figures 3. and 5. illustrate the results of the calculation grounding on the method showed in chapter Material and methods.

Figure 3. shows the ratio and number of 30-34 year employed with higher education according to the forecast (assumed the ratio of higher educated under the 30-34 year employed equals the ratio measured in the full population) and the difference of numbers occurred as result of the measures. The natural expansion (without measures to reach the reference value) of higher educated was considered with a trend line, based on the statistic data starting from 1998 (Figure 4.) to avoid the exaggerated growth in the forecast starting with the level 2009.

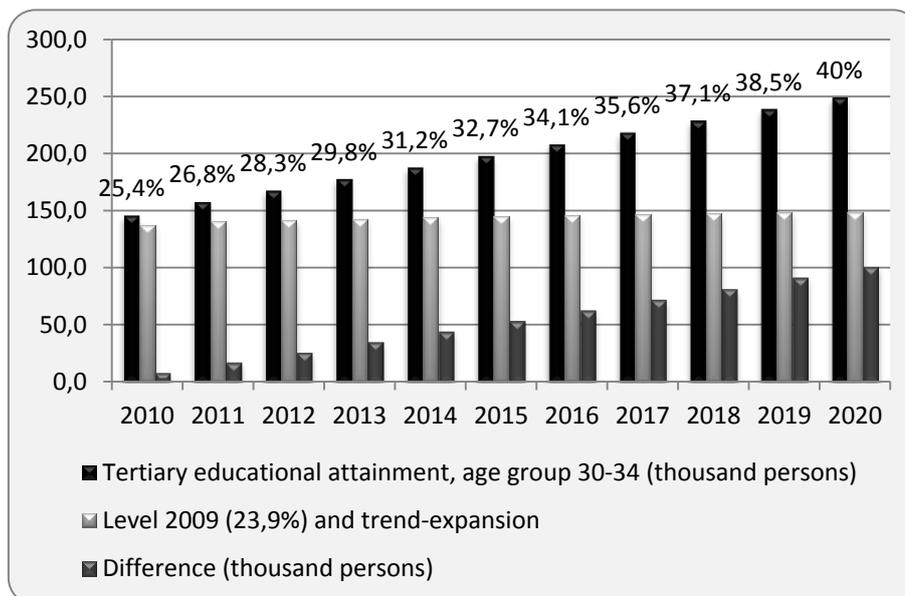


Figure 3.  
Statistic and forecasted number and ratio, tertiary educational attainment, age group 30-34 (thousand persons, %), own compilation

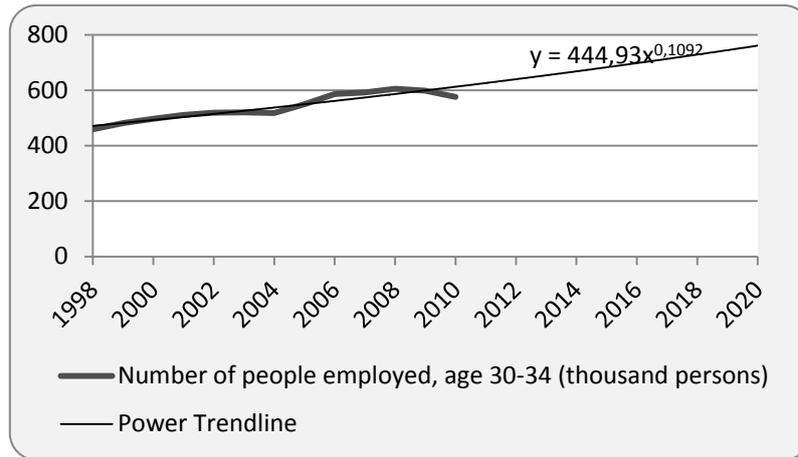


Figure 4.  
Number of people employed, tertiary attainment, age 30-34 and trend-forecast of natural expansion [10], own compilation

The estimated relation between the numerical GDP growth and the education level increase can be seen on Figure 5. The numerical data was planned using the NPV method and the calculated annuity (of obtained yield of individuals on the labour market with higher education level). The annuity which represents the yearly arising surplus for the individual has to be multiplied with the number of 30-34 year aged employees who are employed with higher qualification level after the results of the above mentioned process. The model calculates also with the aggregation of the higher qualified people during the planning period.

As a result of the model based on the methods given it can be concluded that raising the rate of employees between 30-34 having a diploma un-

til 2020 can contribute to the rise of the Hungarian GDP by approximately 1.360 billion HUF during the planning period of 2010-2020.

## 6. CONCLUSIONS

There is no doubt about the role of education – besides the possible inaccuracy (because of simplifications and theoretical assumptions) of the model – in the successful growth of the national economy. The authors haven't considered other positive effects of the process, which occur in the individual's private life or which are hardly quantifiable (esteem, security, quality of life). The research can also be extended to the examination of the development of vocational trainings.

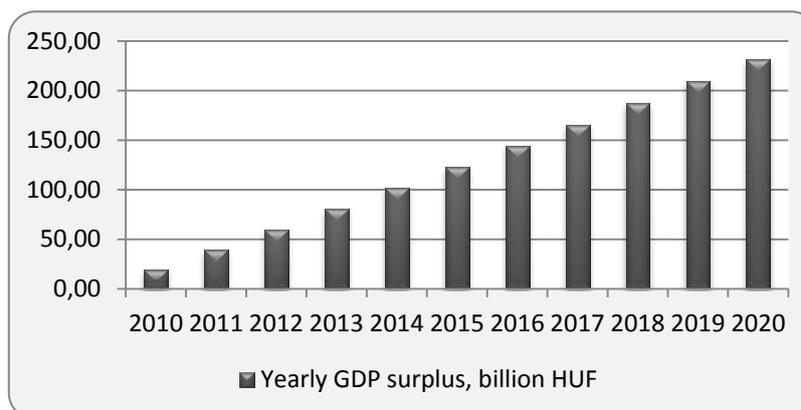


Figure 5.  
Estimated yearly GDP growth during the planning period, own compilation

## 7. LIST OF REFERENCES

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