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ABSTRACT OF DIPLOMA THESIS

Labor as a Factor of Production –A Case Study of the Czech Republic

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Summary

The goal of this diploma thesis is to analyze aspects connected to subset of labor, precisely human capital, such as educational and demographic changes, as well as, to analyze the impact of human capital on economic growth. The thesis is divided into two parts. Firstly, in the theoretical part, all relevant and necessary terms connected to labor and human capital, such as supply and demand, wages, or unemployment, are explained and clarified. Secondly, in the analytical part, descriptive analysis of aspects of education and health, influenced by demographic changes, as main components of human capital, is conducted using quantitative and qualitative research, based on necessary data mining. Thirdly, also in the analytical part, econometric analysis is conducted to determine and quantify the impact of human capital on economic growth in the Czech Republic. For example, the analysis shows, that in the period from 1995 until 2008, the number of university students increased by 136% and the public investments per student increased by 37%, which implies positive influence on the quantity and quality of human capital.

Key words: labor, human capital, economic growth, employment, wages, education, demographic changes, Czech Republic

Objectives

The first goal of the thesis is to analyze aspects, which influence a subset of labor, precisely human capital, in the Czech Republic. The aim is to evaluate aspects of education and health, influenced by demographic changes, as the two main components determining the state of human capital in the country. The second goal is to analyze the impact of human capital on economic growth in the Czech Republic. The aim is also to analyze the size and direction of the relationship between the two variables.

Methodology

Initially, in the theoretical part, all relevant data are collected and subsequently explained to clarify all necessary terms connected to the selected topic. Discussion of gathered theoretical and descriptive material is conducted. Detailed comparison of theories in terms of their applicability and connecting of own research with broader theoretical background and

assumptions based on literature takes place. Methods of synthesis, abstraction and induction are used in the Literature review.

First section of the analytical part, which consists of descriptive analysis, numerical data are collected and subsequently evaluated by comparative methods, in order to explain particular phenomena. In the second section of the analytical part, econometric analysis is conducted, using one-equation linear regression model based on time-series data. Data used in the analytical part are collected mostly from the Czech Statistical Office, but also from Ministry of Labor and Social Affairs. The quantitative data for descriptive analysis ranges as far as from 1950 until 2015. The quantitative data used in econometric analysis is from 1993 until 2015. For visualization of the results, graphs and figures are created and explained. Any extraordinary and noteworthy outcome is pointed out. For evaluation and analysis of the data Microsoft Excel and software for econometric analysis Gretl are used.

Results of the Model

The model was focused on quantifying the influence of amount of physical capital, technological progress and human capital on economic growth. Physical capital, which was express by number of available work force (15 – 64 years of age), has positive influence on economic growth. This means, that if the number of available work force increases, GDP per capita in PPP, which expresses economic growth, increases as well. There also exists positive relationship between technological progress and economic growth. The model suggests, that if total factor productivity increases, the GDP per capita in PPP grows as well. The last relationship of interest, and perhaps the most important, is between human capital and economic growth. Results obtained by the model, where human capital was quantified by average years of schooling, suggest that there is a positive relationship between the two variables. With an increase in average years of schooling, there is an increase in GDP per Capita in PPP, thus increase in economic growth. And as for the size, the parameter estimated by the model has a value of positive 3.21652. This means that with an increase in average years of schooling by one unit and all the other variables held constant, GDP per Capita in PPP would increase by 3216.52 EUR. Parameters of each variable and the model as a whole had to be verified, in order to confirm its suitability for modelling of such relationships. Economic verification confirmed, that the size and direction of parameters was in accordance with economic theory. Testing of statistical significant of each parameter proved that all the estimated parameters were

significant. Testing for goodness of fit by R^2 supports, that 99% of the variation in the dependent variable, is explained by the influencing variables and the functional form of the relationship. Econometric verification verified, that there is no autocorrelation of residuals in the model. The variance does not depend on the parameter, thus there is also no heteroscedasticity in the model and the residuals are normally independently distributed.

Conclusion

The analysis of educational aspects discovered positive trends in increasing number of students, as well as increasing share of people with attained university education. Comparing investments into the educational sector, Czech Republic generally lacks behind the EU average. The country's expenditures on education represent only around 4.5% share of its GDP. The analysis also found, that there are vast differences among wages according to achieved level of education. Focusing more on the health and demographic changes aspect of the analysis, there have been some significant shifts, suggesting ageing of the population. For example, the life expectancy age increased for both men and women since 1989 by 6 years, as well as the average living age, which increased by 6 years as well, for both men and women. At the same time, Czech Republic still lacks behind the EU fertility rate average by 0.2 child per women, which causes inevitable changes in the structure of population. The share of group of 0-15 years of age decreased in the given period by 20% to total of only 14%, while the share of population 65 years old and above, increased in the selected period by almost twice as much to 16%.

The conducted econometric analysis confirmed the assumptions about the impact of quantity of human capital on economic growth and all the other relevant variables, included in the model, in the Czech Republic. There was found direct positive relationship between human capital and economic growth. Based on the parameter of human capital, an increase in quantity of human capital, expressed by average years of schooling, would lead to an increase by 3216.52 EUR in economic growth, expressed by GDP per Capita in PPP, in the Czech Republic. The analysis also confirmed that all of the other variables, physical capital and technological progress have direct positive impact on economic growth. This means, that with an increase in technological progress or physical capital, there would be an increase in economic growth.

The crucial outcome, that comes from the connection of the descriptive and econometric analysis suggests following. It was found that the amount of physical capital does have impact

on economic growth, which can be a problem in the future, because if the ageing of the population continues at given pace, Czech Republic will face certain economic difficulties due to scarcity of labor force. However, it was also discovered that the quantity of human capital, expressed by average number of years of schooling also positively impacts economic growth. Based on the detection, that the number of students with the highest level of achieved education has increased significantly, the possible negative influences of ageing population could be reduced or eliminated by concentrating more on the educational sector. It is up to the relevant authorities of the Czech Republic to develop and implement such solutions, which would contribute to maintaining sustainable economic growth and assure its efficiency.

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