

The Effect of Human Capital on GDP Per Capita for 26 Transition Countries

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ABSTRACT

In this paper we analyse the effect of human capital on economic growth. More specifically we examine the effect of urban population, school enrolment and life expectancy on the GDP per capita. We use data collected from the World Development Index from 1990 to 2010 for 26 out of the 27 transition countries. After using a panel data approach our result are similar with other economists where both school enrolment and life expectancy have a significant positive effect on GDP per capita.

Keywords: ???

1. INTRODUCTION

In today's society one of the key issues for governments worldwide is trying to find the magic formula of increasing economic growth. One can ask herself/himself is there actually a formula, how important productivity growth is, and how do countries perform relative to one another. Economists worldwide have summarized economic development and growth as a four area process. The four areas are: institutional development, human development, basic needs and finally sectorial development. Recently institutional and human capital developments are the key areas that governments worldwide have been focusing to increase productivity growth. Barro and Lee (2013), Cohen and Soto (2007) and De la Fuente and Domenech (2002, 2006) agree that other than technology improvement investment on human capital is the driving force behind economic growth. They all show that the level of school enrolment and life expectation have a significant effect on GDP per capita.

In this research paper we will follow a similar approach to Rapacki and Prochniak (2009) where they focused on the level of economic growth experienced by the 27 transition countries. The collapse of the Berlin Wall, in November 9, 1989 marked the end of the communist countries. Former countries such as Yugoslavia, USSR and Czechoslovakia broke into smaller independent democratic countries. Although Rapacki and Prochniak (2009) focused on the convergence between the countries, we will use a similar approach to them while analyzing the impact that human capital accumulation has on growth.

2. LITERATURE REVIEW

Barro and Lee (2013) used a panel data approach for 146 countries from the period of 1950 to 2010 analysing the educational attainment. They worked with new survey data collected by UNESCO, Eurostat and other sources, which was separated into five years intervals that included estimates of mortality rates and education levels by age and gender. They examined the effect of output on the human stock of capital (by measuring the overall years of schooling). They find that schooling of workers has a significant positive effect on output and also that the level of income at the country level. Cohen and Soto (2007) have published another key paper in this area titled "Growth and human capital: good data, good results" (Cohen and Soto pg. 1). They construed a new data base by using the OECD database and surveys published by UNESCO. To make their results more precise they assumed that older people who on average have a lower education level have higher mortality rates. This means they have accounted for mortality heterogeneity within the age groups. They find that in the standard cross country growth regression that their series yield significant coefficient for schooling. Moreover these results are also significant when the regression account for the accumulation of physical capital in panel data estimation. Their results were similar to De la Fuente and Domenech (2002, 2006), who also highlighted the low quality of schooling data provided by the OECD.

Another interesting paper that looks at the effect of economic growth from a human capital view point is a paper by Cervellati and Sunde (2009). They examine the relationship between life expectancy and economic growth by explicitly accounting for the role of demographic transition. Cervellati and Sunde (2009) followed Acemoglu and Johnson (2007) model to estimate the effect of life expectancy for 47 countries during the period of 1940 to 2000. They introduced a simple demographic transition model where a particular individual's education and fertility rate depend on his/her life expectancy. Moreover, they find that increases in life expectancy reduce the population growth and stimulate human capital accumulation (after the beginning of the demographic transition). This indicates that the effect of life expectancy on income, human capital and population varies depending on if it is before or after the demographic transition. Furthermore, they indicate a sufficiently high life expectancy as the key ingredient in starting the transition to sustained income growth.

4. DATA

The data that we will be using for this paper is from the World Development Index. We have collected data for the period of 1990 to 2010 on GDP, GDP per capita, urban population, school enrolment and life expectancy for 26 out of the 27 transition countries. We do not include Serbia because after the independence of Montenegro in 2006 the data is misleading (UNODC Report 2011).

5. MODEL

We will be using panel data estimation because we have multi-dimensional data frequently involving measurements over time. Which means that we are examining data for the same 26 countries over the 20 year period. To examine the effect of human capital on growth we will use the equation given below:

$$Y_{it} = \beta_0 + \beta_1 (\text{Urban Population}) + \beta_2 (\text{School Enrollment}) + \beta_3 (\text{Life Expectancy}) + u_i$$

In our case the dependent variable (Y_{it}) will be GDP per capita in current \$US. While the dependent variables will be urban population (measured as a percentage of the total population), school enrolment (measures the successful completion of secondary education) and life expectancy at birth. Even though, urban population is not usually taken as an instrument for measuring human capital but we know that if you live in an urban environment you have an easier life style. Where an easier life style usually means less stress; and less stress leads to a more productive thinking. This is the reason behind including urban population as an instrument of human capital. After running a regression for the entire 26 countries we will break the countries into three groups based on geographical location; where we will analyse in more details the effect of human capital on growth.

6. RESULTS

The results are summarized in four tables in the Appendix. Table 1 looks at what effect urban population, school enrolment and life expectancy have on the GDP per capita. First by looking at the coefficients we can see that the percent of urban population effects GDP per capita negatively (this might be because by moving into the urban cities the agriculture sector might suffer). On the other hand, school enrolment and life expectancy have a strong positive effect on GDP per capita. For example if we were to increase school enrolment by 1 year GDP per capita would increase by \$125.51. While if life expectancy were to increase by 1 year GDP per capita would increase by \$688.05. Finally both school enrolment and life expectancy are significant a significant effect on GDP per capita (also found by Barro and Lee, 2013).

Similarly to Rapacki and Prochniak (2009) we divide the transition countries into three geographical groups; South-Eastern European countries (SEC shown on Table 2), Commonwealth of Independent countries (CIC shown on Table 3) and Central and Eastern European countries (CEC shown on Table 4). As before we note that for all the three groups urban population has a negative effect on GDP per capita. While as we would expect school enrolment and life expectation have a positive effect on GDP per capita. But an interesting result is that for the Commonwealth of Independent countries, the effect on human capital on GDP per capita is not as strong compared to the other two regions. For example, if we were to increase life expectancy by 1 year GDP per capita would increase by \$294.6 for the CIC countries which is much lower than the increase of \$886.25 for the SEC countries or the increase of \$1153.66 for the CEC countries. Furthermore, for all the three groups both school enrollment and life expectancy have a significant effect on GDP per capita.

7. CONCLUSION

In conclusion, recently there has been extensive study on how human capital effects economic growth. Economist such as Cohen and Soto (2007) and Barro and Lee (2013) have showed that school enrolment have significant positive effect on growth.

While others such as Cervellati and Sunde (2009) indicate that it is not just school enrolment but also life expectancy that effect growth. In this paper we used the 26 post-communist transition countries and similarly to Rapacki and Prochniak (2009) we divided the countries into 3 different groups based on location. As expected we find that both school enrolment and life expectancy have a significant positive effect on GDP per capita. For future research we will also be looking at other humancapital variables such as university ranking and investment on research and development.

8. APPENDIX

Table 1: The effect on human capital variables on GDP per capita for the entire sample of countries

Variables	Coefficient	Standard error	Z-statistics
Urban population	-30.42	33.41	-0.91
School enrolment* ^o	125.51	8.3	15.11
Life expectancy at birth* ^o	688.05	69.43	9.91
Constant	-47384.5	5096.21	-9.3

Indicate significance level accordingly at the 1%, 5% and 10% level

Table 2: The effect on human capital variables on GDP per capita for the South-Eastern European countries (includes: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Macedonia and Romania).

Variables	Coefficient	Standard error	Z-statistics
Urban population [•]	-123.33	71.19	-1.73
School enrollment* ^o	108.36	20.33	5.33
Life expectancy at birth* ^o	886.25	172.66	5.13
Constant	-57594.19	11460.98	-5.03

Table 3: The effect on human capital variables on GDP per capita for the Commonwealth of Independent countries (includes: Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan)

Variables	Coefficient	Standard error	Z-statistics
Urban population	-1.14	18.16	-0.06
School enrolment* ^o	64.81	9.63	6.73
Life expectancy at birth* ^o	294.6	57.41	5.13
Constant	-20544.93	3877.24	-5.3

Table 4: The effect on human capital variables on GDP per capita for the Central and Eastern European countries (Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia)

Variables	Coefficient	Standard error	Z-statistic
Urban population	-39.98	94.97	-0.42
School enrolment* ^o	108.86	19.13	5.69
Life expectancy at birth* ^o	1153.66	203.5	5.67
Constant	-78396.36	16815.46	-4.66

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