



## INEQUALITY IN EDUCATION AND PERSONAL INCOME

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### **Abstract**

*The latest policies in Albania considering the inequality in education, aim to smooth these inequalities, which brings the necessity to analyze the effect of this inequality over personal income. The objective of this research is to bring into focus the high negative correlation between inequality in education and personal income. Firstly, it should be explicated the lack of a proper model due to the insufficiency of data on the national level, so that we will use GINI coefficient to measure inequality in education. After that, it will be demonstrated the effect of education over individual incomes through an econometric model provided by Living Standards Measurement Survey 2008 and Mincer equation. Assumed from data analysis in Albania, inequality in education has a negative effect on individual's income. To begin with, it will be introduced an overview of inequality and the impact over individual incomes. Afterward, there is a comparison among Albania case and other countries like Germany, Turkey and Bulgaria. In addition, It will be applied Mincer equation for Albania. The model will be analyzed at different aspects. Firstly, it will be analyzed the relation of wages with education level and job experiences. After that, the model will be applied for males and females to distinguish the differences among education levels based on genders. In the end, important conclusions are reached such as strong negative correlation between inequality in education and personal income.*

*Keywords: Inequality in education, personal income, gender inequality, Mincer equation, wage, job experience*

## INTRODUCTION

Over the years there have been several empirical researches studying the effects of human capital on economic growth. The main topic analyzed is whether high levels of education or additional improvements in this area are associated with the rapid growth of total output, that is itself a country's economic growth.

The importance of human capital models to study economic growth is supported by a wide literature such as the empirical studies of Barro (1991) and Benhabib and Spiegel (1994) that reached the conclusion of a strong positive correlation between levels of education and levels of output on an economy. To further support this conclusion, Temple (1990) and Cohen and Soto (2001) concluded on a strong positive correlation between the improvement in education economic growth. One of the main arguments that make evident the impact of human capital on economic growth, is that a workforce with higher levels of education are more easily adapted with new technologies which brings possibilities to close faster the technology gap with other countries.

At the most of the cases, in the models of economic growth, the influence of a range of factors such as education, technological development, integration, trade, improving the quality of institutions etc. is calculated through the variable of total factor productivity (TFP). Total factor productivity (TFP) is a variable measuring the effects on production that do not originate from basic inputs such as capital work.

In the article "Determinants of economic growth in Albania" (Kota, 2009) the author presents the contribution to economic growth in Albania from 1990 to 2009 of TFP, the capital and employment. It is well-defined that total factor productivity has had a significant impact on economic growth. On the other hand, in the research work of institute 'Agenda' it is mentioned education as a determining factor of TFP. Also, a comparison of education in Albania with several regional countries and the EU is made.

In the beginning, we will see the education situation in Albania comparing with some other countries and Mincer model. Then, we will apply Mincer model for Albania. Secondly, we'll make two other regressions one for male and one for female. Thirdly, we'll study the impact of education in poverty.

## EDUCATION SITUATION IN ALBANIA

62% of Albanian youth has not finished secondary education clearly indicates that Albania is a country that has suffered the most from inadequate policies in the field of education during the transition (see Table 1). On the other hand, these percentages give us an idea of untapped

potential of the Albanian youth and the positive impact it would have its usage on human capital of Albania and economic growth.

Table 1. People in age 18-24 that haven't finished high school

Albania	61.9%
Croatia	5.4%
Macedonia	36.2%
Serbia	11.4%
BE (medium value)	17.3%

Source: Agenda Institute (2009)

### The level of education and income of an individual (Mincer Equation)

The assumption that human capital has strong and positive impact on economic growth is based on the fact that in general there is a positive initiative for any individual to invest in their education. Some individuals invest to be well-educated so that their future earnings will be higher than those without education. Therefore, it is important to study how education affects incomes.

Efforts that people make to continue studies after compulsory education might be considered as an investment with the potential to bring future financial profits. The costs of this investment can be divided into direct costs such as tuition fees, travel, accommodation etc., and indirect costs, which include incomes that an individual might have if he would work instead of studying. Similar to any investment, education has a future rate of return which creates expectations from observations of everyday reality where individuals with higher education levels also reach higher income levels.

Jacob Mincer in his book "Schooling, Experience and Earnings" created a model that express the natural logarithm of income as function of years education and work experience. For this particular model, the version used more frequently is the natural logarithm of income which is stated as the sum of a linear function of years education with a quadratic function of years of work experience as follows:

$$\ln y_i = \beta_0 + \beta_1(\text{edu}_i) + \beta_2(\text{ex}_i) + \beta_3(\text{ex}_i^2)$$

Where,  $y$  are incomes,  $\text{edu}$  are the years of education,  $\text{ex}$  are years of experience.

Referring to work experience, quadratic function is used to represent the fact that an individual's investment in further qualifications while working, decrease with age as well as the return on these investments.

### Connection between education and personal incomes in different countries

To analyse this connection we calculate Pearson correlation coefficients for two variables:

LnGDP --natural logarithm of personal incomes

Ed--- the average years of study for people over 25 years old

Table 2. Connection between education and personal incomes in Britain

	lnGDP_Britany	Ed_Britany
LnGDP_Brit Pearson correlation	1	0.99
Ed_Brit Pearson correlation	0.99	1

Source: Author's calculations

Table 3. Connection between education and personal incomes in Germany

	lnGDP_Germany	Ed_Germany
LnGDP_Ger Pearson correlation	1	0.989
Ed_Ger Pearson correlation	0.989	1

Source: Author's calculations

Table 4. Connection between education and personal incomes in Turkey

	lnGDP_Turkey	Ed_Turkey
LnGDP_Tur Pearson correlation	1	0.969
Ed_Tur Pearson correlation	0.969	1

Source: Author's calculations

Correlation coefficients between LnGDP and Ed are too close to 1 for these three countries. This proves that connection between this variables is positive and very strong. We conclude that the more we study, the more we we'll be paid and this might improve economic growth.

### The application of Mincer's model for Albania

Level Measurement survey of Living is a survey with several purposes which is carried out within the family. It is considered as the main input to measure living conditions, poverty situation, etc. The data used on this survey belong to employment module to determine hourly earnings and experience of individuals, educational module to determine the number of school years that any person has committed and other demographic data.

Taking into consideration that the survey sample is large, from its data were selected those who were between the range of 26-30 years old in 2008. This signifies that if this

population has attended school without interruption in 2004, they would have earned an undergraduate degree. They would also have had four years experience until 2008. The reason for this selection was to eliminate the phenomenon of students just graduated who may be willing to work for very low wages in professions where the normal wage may be higher. Also, it has been excluded that part of population which has a long working potential experience. This kind of experience might affect other people with higher education level taking lower wages. At the conclusion of the exclusion process, the number of observations was N=237

### Econometric model of relationship of wages with education and experience at the work

Based on the equation of Mincer we can build our model:

$$\ln Wage_i = \beta_0 + \beta_1(edu)_i + \beta_2(ex)_i + \beta_3(ex)_i^2 + \beta_4(gen)_i$$

where:

$\ln Wage_i$  → natural logarithm of hourly wage for each person

Edu → years of education finished

Ex → years of each person on actual work

$Ex^2$  → square form of experience variable

Gen → dummy variable (0=male, 1=female)

After calculations on SPSS program we received this regression

$$\ln Wage = 5.713 + 0.105 \text{ edu} + 0.096 \text{ ex} - 0.004 \text{ ex}^2 - 0.099 \text{ gen}$$

(14.806)      (3.8)      (-2.067)      (-1.987)

As we see student statistic for each coefficient is bigger than  $t_{kr} = 1.96$ , so that each coefficient is important.

Fisher statistic for this model is  $F = 61.268 > F_{kr} = 2.41$

Explained coefficient for the model is  $R^2 = 0.514$

In continue we'll test multicollinearity with inflation factor (VIF)

Table 5. Test of multicollinearity

Variable	VIF
Education	1.224
Experience	9.759
experience <sup>2</sup>	9.843
Gender	1.137

Source: Author's calculations

None of these values are bigger than 10 so we don't have multicollinearity problem, but these values are near to 10. We expected this result because is a close relationship between experience and its square form.

### Interpretation of the model

Considering this model, we conclude that the natural logarithm of the salary of a male person without any taking any class and with no work experience would be 5.173. In other words his hourly wage would be 302.77 ALL and the monthly wage would be 72 664 ALL by working 8 hours a day for 30 days a month. Meanwhile a female on the same circumstances will receive a monthly salary of 65 818. From this model it appears that the natural logarithm of a person's salary increased by 0.105 for every additional year of education. Seeing that the model is log-in type, hourly wages are expected to increase by 11% for each additional year of education, for every person who decides to invest in their education. In order to better understand the differences in wages, they are presented in the following table:

Table 6. Model testing

	EDUCATION LEVEL			
	Without education	Elementary school (9 years of education)	High school (12 years of education)	University (17 years of education)
Wage/hour Male	302.8ALL/hour	701.3ALL/hour	1067.4ALL/hour	1624ALL/hour
Wage/hour Female	274.2ALL/hour	635ALL/hour	966.8ALL/hour	1471.4ALL/hour
Changes of wages in %	–	–	52.2%	131.6%

Source: Author's Calculations

To interpret the model we should had in focus that we have in the model square form of experience and the age of the sample (26-30). None of these persons had more than 14 years of working because minimal age of working in Albania is 16. From the function of the experience:  $0.096\text{experience} - 0.004\text{experience}^2$  see that experience has positive effect for each year.

On the other hand, dummy variable of gender is important so we'll test 2 other models i.e. one for the male and for the female.

**Model for male:**

$$\ln \text{Wage} = 5.759 + 0.096 \text{ edu} + 0.115 \text{ ex} - 0.005 \text{ ex}^2$$

$$(9.574) \quad (3.347) \quad (1.895)$$

Siç shihet nga statistika Students statistics are bigger than  $t_{kr} = 1.96$  so all variables are important.  $F = 33.935 > F_{kr} = 2.68$  (model is statistically important).  $R^2 = 0.45$

**Model for female:**

$$\ln \text{Wage} = 5.565 + 0.116 \text{ edu} + 0.059 \text{ ex} - 0.002 \text{ ex}^2$$

$$(11.291) \quad (1.556) \quad (0.569)$$

From student statistic except education variable the others are unimportant. This doesn't mean that experience has no effect to wages for female but exist multicollinearity between variables.

See again models that we had:

**Male:**

$$\ln \text{Wage} = 5.759 + 0.096 \text{ edu} + 0.115 \text{ ex} - 0.005 \text{ ex}^2$$

$$(9.574) \quad (3.347) \quad (1.895)$$

**Female:**

$$\ln \text{Wage} = 5.565 + 0.116 \text{ edu} + 0.059 \text{ ex} - 0.002 \text{ ex}^2$$

$$(11.291) \quad (1.556) \quad (0.569)$$

It is noted that an uneducated woman is paid less than an uneducated man. This is because men can work in jobs that require less education but more physical strength. The wage benefit for one more year of schooling is greater for women than for men. This is probably due to higher demand for educated women than those without education. In conclusion, we say that women have more incentive to get an education.

**IMPACT ON POVERTY**

In the table below are summarized the differences in poverty by gender:

Table 7. Poverty and gender

	Men	Women	Poverty Gap %
2008	24.3%	26.15%	+ 7.6%
2012	27.42%	31.08%	+13.34%
The change on poverty rate	12.8%	18.8%	+6%

Source: World Bank, Author's calculations

As we see in Albania women are overrepresented in the ranks of poor. The level of poverty is greater for women, 31%, compared to 27.4% of men and also the gender gap in poverty is extended from 2008 to 2012. Education has an important role on the empowerment and welfare of women; according to World Bank (2015), more years of education are negatively correlated with the level of poverty for women and men and Martín and Egido (2013) concluded that higher education increases the probability of exiting from poverty by about 60 percent.

## CONCLUSIONS

By analyzing the Pearson coefficients for some countries, it is presented a positive correlation between education and income per capita. It means that lack of education or inequality in education has a negative impact on income per capita and economic growth. This should bring further investment in education to promote economic growth.

By application of Mincer equation in Albania it is proved again the strong positive correlation between the two variables. We showed that each additional year of schooling brings increased revenues by 11%.

Given that the population of Albania has low education levels, we gave evidence of the gender differences regarding education and income. At the conclusion of this paper we should note that the massification of education policies in recent years will have a positive impact on the Albanian economy by increasing even more investment in education. Albanian's government should increase expenditures for education. Education should be a priority in government's policies. It is suitable to take place an improved pay structure for future teachers to ensure their caliber is of a high enough quality especially for the new generations.

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