Returns to education in the period of Greek junta.

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Abstract

Years of schooling are proven in bibliography to have a positive effect on the wage of people. In this paper I am presenting the negative effect on education in this period caused by the decrease of mandatory education years from 9 to 6. This event appears to have resulted in a reduction of years of schooling by 0.27 on general, by 1.27 on men and by 0.48 on women. Lastly, education was estimated to a have a positive effect on wage and an additional year would result in an increase of the hourly wage by 15%.

Introduction

In the history of bibliography, an additional year of education or an additional year of experience is observed to have a positive effect on the income of a person (Lemieux 2003, Psacharopoulos – Patrinos 2018). In Greece, in the period of Junta the mandatory schooling years were reduced from 9 to 6, based on the above statement we expect the wages of the Greek citizens to be significantly lower during that time. We are going to investigate if education in our data confirms the bibliography and affects the wage positively and lastly if the reduction of mandatory schooling years also reduced the general education levels of Greek people.

Data

Our data are originated from the Greek Statistical Survey of 2015 containing information about Greek citizens during the time we are interested in (Greek Junta). After omitting the missing values for the sake of our analysis and setting the education levels to range from 0 to 25 from a logical point of view, I also used only data from people aged 25 to 64 in order to better observe the effects on education and wage. Furthermore, I constructed a variable called period to obtain value 1 if the person is born between 1951-1955, value 2 if the person is born between 1956-1964 (period of interest) and value 3 if the person is born between 1965-1990. Lastly, I only used a portion of the variables available as explained below:

Hourly wage: The hourly wage of a person calculated by [monthly wage/ (working hours in a week *4.1666)] ranged from 3 to 14.88
Years of schooling: Number of years of education ranged from 0 to 25 calculated by [gradyear-(2016-age+6)]
Experience: Number of years of experience ranged from 1 to 46.
Age: Age of person ranged from 25 to 64.
Woman: Dummy variable, 0 is male and 1 is female.
Native born: Dummy variable, 0 is foreign and 1 is native.
Region: Person's region of residence ranged from 1 to 13.

In Table 2 we notice that general education level in period 1 was reduced from 12.2 to 11.75 in period 2 and then increased again. For men years of schooling were reduced from 12.92 to 11.82 but surprisingly for women they were increased from 10.94 to 11.64 years.

Table 1. Summary Statistics

Variable	Mean	Standard deviation	Minimum	Maximum	Observations
Hourly wage	5.73	2.22	3	14.88	8,632
Years of schooling	12.65	3.97	0	25	8,632
Experience	12.05	9.04	1	46	8,632
Age	42.28	9.18	25	64	8,632
Woman	0.45	0.49	0	1	8,632
Native born	0.90	0.30	0	1	8,632
Region 1	0.07	0.26	0	1	8,632
Region 2	0.18	0.39	0	1	8,632
Region 3	0.03	0.16	0	1	8,632
Region 4	0.06	0.23	0	1	8,632
Region 5	0.05	0.22	0	1	8,632
Region 6	0.02	0.15	0	1	8,632
Region 7	0.05	0.21	0	1	8,632
Region 8	0.06	0.24	0	1	8,632
Region 9	0.28	0.45	0	1	8,632
Region 10	0.07	0.25	0	1	8,632
Region 11	0.02	0.15	0	1	8,632
Region 12	0.02	0.16	0	1	8,632
Region 13	0.07	0.26	0	1	8,632

Source: Greek Statistical Survey 2015, https://www.statistics.gr/

Table 2. Average years of schooling for cohorts affected and not affected by the Junta's policy to reduce years of compulsory schooling from 9 to 6.

Born in	Year sin compulsory schooling	Total	Men	Women
1951-1955	9	12.28	12.92	10.94
1956-1964 (affected)	6	11.75	11.82	11.64
1965-1990	9	12.84	12.36	13.39

Source: Source: Greek Statistical Survey 2015, https://www.statistics.gr/

Empirical model

Presentation of the econometric models: OLS and IV-2SLS.

In this paper the main econometric models that were used are OLS and IV-2SLS. Firstly, in Table 3 OLS was used as formatted below with the logarithm of hourly wage as the dependent variable and years of schooling, experience, experience squared, year born, woman, foreign born as the independent variables and region as a fixed effect (in the third model) in three different models and three times, one for the general data, one for male sub data and lastly one for female sub data:

First OLS model was formatted as:

$$W = b_0 + b_1 S + u_t$$

where W is for wages of employees and S is for years of schooling.

Second OLS model was formatted as:

$$W = b_0 + b_1 yS + b_2 E + b_3 E^2$$

where experience (E) is added, and experience squared due to bibliography verifying that experience doesn't have a significant impact after a certain point.

Third OLS model was formatted as:

$$W = b_0 + b_1 yS + b_2 E + b_3 E^2 + b_4 Y + b_5 G + b_6 F$$

where we also added the year born (Y), the gender (G) where is a binary variable with 1 if female and variable foreign (F) where if value is 1 then the person is foreign.

Then in table 4, IV-2SLS was used to better calculate the effect of the decrease of mandatory years of education from 9 to 6 with the use of instrument variable period value 2 to years of schooling variable in the first stage and the aforementioned dependent and independent variables and region as a fixed effect. The three models were the same, with the first stage model formatted as:

$$yearsofschooling = b_0 + b_1 yearborn + b_2 woman + b_3 foreign + b_4 period_2$$

Both models' assumptions were satisfied and standard errors corrected for heteroskedacity.

Estimation results

With the use of the OLS model, it is observed that education indeed has a positive effect on wages confirming bibliography (Lemieux 2003, Psacharopoulos – Patrinos 2018) with an additional year of education increasing the hourly wage by 0.3% both for men and women. Furthermore, as expected experience also increases hourly wage by 0.2% with each additional year and $experience^2$ has a small decrease on wage again already confirmed in bibliography. People born on a later year seem to have a decrease of 0.5% and women are receiving an hourly wage that is 4.15% less than men. Lastly, foreign born citizens receive a 12.73% lower wage than native born. All independent variables are statistically significant in the 1% significance level and explain 37.8% of the volatility of wage.
Then with the use of IV-2SLS which better captures the actual effect of education on wages it is estimated that during the period of Greek Junta years of schooling were reduced by 0.27 on general, by 1.27 on men and by 0.48 on women. It is also estimated that education actually has an increase on wage by 15% on a 10% significance level.

Table 3. Wage estimates (OLS)

Variable	Model 1	Model 2	Model 3
Sample: All			
Constant	1.2557*** (.1090)	1.0251*** (.1141)	11.4197*** (.7946)
Years of schooling	.0335*** (.0008)	.0326*** (.0008)	.0331*** (.0008)
Experience	-	.0244*** (.0011)	.0224*** (.0011)
Experience squared	-	-.0002*** (.0000)	-.0002*** (.0000)
Year born	-	-	-.0052*** (.0004)
Woman	-	-	-.0415*** (.0061)
Foreign-born	-	-	-.1273*** (.0099)
Regional dummies	No	No	Yes
R-squared	.141	.345	.378
Observations	8,632	8,632	8,632
Sample: Men			
Constant	1.3153*** (0.1394)	1.0728*** (.1449)	10.1345*** (1.0114)
Years of schooling	.0308*** (.0011)	.0300*** (.0010)	.0287*** (.0010)
Experience	-	.0249*** (.0014)	.0237*** (.0014)
Experience squared	-	-.002*** (.0000)	-.0003*** (.0000)

Year born	-	-	-.0045*** (.0005)
Woman	-	-	-
Foreign-born	-	-	-.1360*** (.0130)
Regional dummies	No	No	Yes
R-squared	.133	.360	.396
Observations	4,755	4,755	4,755
Sample: Women			
Constant	1.1481*** (.1722)	.9423*** (.1831)	14.2085*** (1.3129)
Years of schooling	.0393*** (.0013)	.0376 *** (.0012)	.0398*** (.0013)
Experience	-	.0236*** (.0018)	.0204*** (.0018)
Experience squared	-	-.0002*** (.0000)	-.0002*** (.0000)
Year born	-	-	-.0067*** (.0006)
Woman	-	-	-
Foreign-born	-	-	-.1211*** (.0158)
Regional dummies	No	No	Yes
R-squared	.165	.337	.367
Observations	3,877	3,877	3,877

Source: Greek Statistical Survey 2015, https://www.statistics.gr/

Notes: The dependent variable is the natural logarithm of hourly wages. Standard errors on parenthesis corrected for heteroskedasticity.

Table 4. Wage estimates (IV-2SLS)

Variable	First-stage results (Dependent: years of schooling)	Second-stage results (Dependent: ln wages)
Sample: All		
Constant	-129.6361*** (12.7669)	28.2021** (11.2044)
Years of schooling	-	.1506* (.0782)
Experience	-	.0.147*** (.0056)
Experience squared	-	-.0001*** (.0000)
Year born	.0715*** (.0064)	-.0144** (.0061)
Woman	.7483*** (.0812)	-.1301** (.0603)
Foreign-born	-.2743*** (.1457)	.1948 (.2149)
Born in 1956-1964 (instrument)	-.2736* (.1589)	-
Regional dummies	Yes	Yes
Observations	8,632	8,632

Sample: Men		
Constant	-75.3617*** (17.3872)	23.6371 (22.2392)
Years of schooling	-	.1930 (.2707)
Experience	-	.0164 (.0128)
Experience squared	-	.0002 (.0002)
Year born	.0439*** (.0087)	-.0123 (.0128)
Woman	-	-
Foreign-born	3.0927*** (.1913)	.3718 (.8376)
Born in 1956-1964 (instrument)	-.1379 (.2141)	-
Regional dummies	Yes	Yes
Observations	4,755	4,755
Sample: Women		
Constant	-208.5507*** (18.6306)	33.94*** (12.5231)
Years of schooling	-	.1250** (.0538)
Experience	-	0.0115* (.0.062)
Experience squared	-	-.0001 (.0001)
Year born	.1121*** (.0093)	-.0172* (.0066)
Woman	-	-
Foreign-born	-2.2112*** (.2263)	.0676 (.1202)
Born in 1956-1964 (instrument)	-.4859** (.2327)	-
Regional dummies	Yes	Yes
Observations	3,877	3,877

Source: Greek Statistical Survey 2015, https://www.statistics.gr/

Notes: Standard errors on parenthesis corrected for heteroskedasticity.

Conclusions

Consistent with bibliography, it is also confirmed in this paper that education affects the wage of a person positively. As stated in the initial hypothesis, the decrease of mandatory years of schooling from 9 to 6 during the period of Greek junta resulted in the reduction of the general education levels of Greek citizens further resulting in lower wages and a negative effect in the Greek economy. With the use of IV-2SLS method I managed to better estimate the true effect of education on wages and observe the

behavior of people born in the period of interest (1956-1964) to confirm the hypothesis that during this time wages and education were significantly lowered.

References

Lemieux, T. (2006). The “Mincer equation” thirty years after schooling, experience, and earnings. In *Jacob Mincer a pioneer of modern labor economics* (pp. 127-145). Springer, Boston, MA.

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