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Economic Rates of Return on Higher Education in Greece, 1962-2022

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Abstract

This article investigates the trend of the rates of return (rr) on higher education in Greece for the period of 1962-2022. It attempts to show that the return on higher education is low compared to high-income economies. It argues that it calls for reform in terms of financing and governance.

Keywords

Rates of Return on Higher Education, Funding of Education, Educational Policy

1. Introduction

According to literature, the quality is determined by internal and external effectiveness of education (Magoula, 1999a).

External effectiveness of schooling refers to the successful entry of graduates into either the next level of education or the labor market. The study of external efficiency is mainly focused on the study of the rates of return on education. It should be noted that the rates of return on education reflect in addition to the quality of the education provided, the demand for education as well.

Greece is a country characterized by a "high" demand for higher education (Magoula, 1999b). According to the data from ELSTAT and the Greek Ministry of Education, Religious Affairs and Sports in 1961, there were 28,140 students' applicants for higher education, while in 2022, there were 99,305 (see Table A1). So, during the above period, there was an increase in the demand for higher education in Greece by 352.9%.

In addition, it should be noted in comparison that there were more male students in the first period up to the beginning of the 1980s, while in the next period from 1980 until 2022, there were more female students (see IOBE, 2017: p. 58).

In the international literature, there are several ways of estimation of rates of

return on education. The Elaborate Method, or Full Method, and the Method based on the Mincer equation are usually used. The choice of method depends to a significant extent on the data. The most common method is the method based on the Mincer equation (Patrinos, 2016).

Based on the Mincer equation method, many studies have been conducted for Greece from the 1960s to today.

Specifically, the following are recorded:

1) According to Leibenstein's (1967) study, the rate of return on higher education in Greece in 1962 amounted to 6%. It should be noted that the study was based on a very small sample from the Athens area, but it was the first study done in Greece.

2) According to a study conducted by Psacharopoulos in 1977 (Psacharopoulos, 1982) on a larger—than Leibenstein—sample of the urban population, the rate of return on higher education in Greece was 5.5%. In other words, he observed a downward trend in the larger sample.

3) In Magoula and Psacharopoulos's (1999) study, using data from the ELSTAT Household Budget Survey, it was concluded that the rate of return on higher education in Greece amounted to 8.7%.

4) Subsequently, Prodromidis and Prodromidis (2008) also using data from the ELSTAT Household Budget Survey (HBS) concluded that the rate of return on higher education amounted to 9%. In other words, an increasing trend of the rates of return on higher education continued, as shown in Table 1.

This article investigates the trend of the rates of return on higher education in Greece for the period 1962-2022. For this purpose, data from the Household Budget Survey (HBS, ELSTAT) will be used.

2. Methodology

Based on the data that we have from the
https://www.statistics.gr/documents/20181/fae98df5-d44a-6a13-a681-75d2456 1fac4, we will apply the Mincer Method (Mincer, 1974). The Mincer equation explains earnings as a function of schooling and labor market experience, giving a clear sense of average monetary returns of one additional year of schooling (Patrinos, 2016).

Table 1. RR on higher education, 1962-1999.

Year	rr on higher education
1962	6.0
1977	5.5
1993	8.7
1999	9.0

Source: Magoula and Psacharopoulos (1999, Table 13), Prodromidis and Prodromidis (2008, Table 5).

According to the standard Mincer equation, income from work is equal to:

$$\ln W = a + bS + c(EXP) + d(EXP)^2 + u \qquad (1)$$

In Function (1), the dependent variable W (wages) which is the income from work is determined by the following independent variables: S (schooling) which equals years of education and (EXP) experience which corresponds to work experience. Work experience (EXP) is calculated as follows: $EXP = AGE - S$ (total years of study) $- 6$ (age of enrolment in compulsory education).

Mincer equation can be used to estimate returns at different levels of schooling by converting the continuous year of schooling variables (S) into a series of dummies variables.

So, we extend the basic Mincer equation with the dummies variables S_2 and S_3, to estimate the rates of return to higher education.

$$\ln W = a + b_2 S_2 + b_3 S_3 + c(EXP) + d(EXP)^2 + u \qquad (2)$$

where S_2 is equal to 1 for persons who completed secondary school, 0 otherwise, S_3 is equal to 1 for persons who completed at least a university degree, 0 otherwise.

After fitting this extended earning function, the private rate of return to different levels of schooling can be derived from the Psacharopoulos' formula (Cohn & Addison, 2006; Psacharopoulos, 1982) suggests that the marginal rate of return to schooling (per year of extra study) is given by the following formula:

$$r_{\text{higher versus secondary}} = (b_3 - b_2)/(n_3 - n_2) \qquad (3)$$

where n_2, n_3 are respectively the years 6 and 4 ($n_2 = 6$ and $n_3 = 4$) of education associated with the levels of education S_2 and S_3.

3. Data

The data are from the Household Budget Survey (https://www.statistics.gr/documents/20181/fae98df5-d44a-6a13-a681-75d2456 1fac4). The HBS survey was conducted by the Hellenic Statistical Authority covering 6196 private households throughout the country. The Household Budget Survey is a national survey collecting information for a representative sample of households, on households' composition, members' employment, living conditions and mainly focusing on their members' expenditure on goods and services as well as on their income. The HBS is the most appropriate source to analyze the changes in the living conditions of the households in comparison with the previous surveys (see: https://www.statistics.gr/el/statistics/-/publication/SFA05/-).

4. Earnings Functions: Empirical Results

In the following tables, we present the results of the data processed from https://www.statistics.gr/documents/20181/fae98df5-d44a-6a13-a681-75d2456

According to the results of **Table 2**, the rate of return is estimated as follows:

$$r_{\text{higher versus secondary}} = (b_3 - b_2)/(n_3 - n_2) = (0.584 - 0.239)/4 = 0.345/4 = 0.8625$$

So, the rate of return is 8.63%.

According to the results of **Table 3**, the rate of return is estimated as follows:

$$r_{\text{higher versus secondary}} = (b_3 - b_2)/(n_3 - n_2) = (0.480 - 0.144)/4 = 0.336/4 = 0.084$$

So, the rate of return is 8.4%.

According to the results of **Table 4**, the rate of return is estimated as follows:

$$r_{\text{higher versus secondary}} = (b_3 - b_2)/(n_3 - n_2) = (0.740 - 0.331)/4 = 0.409/4 = 0.10225$$

Table 2. RR on higher education, 2022.

Model	Unstandardized coefficients		Standardized coefficients	T	Sig
	B	Std. error	Beta		
Constant	8.331	0.057		147.407	0.000
Experience (exp)	0.048	0.003	0.966	14.317	0.000
Exp * exp	−0.001	0.000	−0.750	−10.775	0.000
Secondary	0.239	0.048	0.215	4.966	0.000
Higher	0.584	0. 050	0.521	11.717	0.000
R = 0.425, R^2 = 0.180, F = 168.969, dF = 4					

Source: ELSTAT (Hellenic Statistical Authority),
https://www.statistics.gr/documents/20181/fae98df5-d44a-6a13-a681-75d24561fac4.

Table 3. RR on higher education, 2022 (men).

Model	Unstandardized coefficients		Standardized coefficients	T	Sig
	B	Std. error	Beta		
Constant	8.413	0.075		112.859	0.000
Experience (exp)	0.059	0.004	1.234	13.355	0.000
Exp * exp	−0.001	0.000	−0.984	−10.405	0.000
Secondary	0.144	0.062	0.133	2.316	0.021
Higher	0.480	0.065	0.436	7.443	0.000
R = 0.468, R^2 = 0.219, F = 110.829, dF = 4					

Source: ELSTAT (Hellenic Statistical Authority),
https://www.statistics.gr/documents/20181/fae98df5-d44a-6a13-a681-75d24561fac4.

Table 4. RR on higher education, 2022 (women).

Model	Unstandardized coefficients		Standardized coefficients	T	Sig
	B	Std. error	Beta		
Constant	8.212	0.080		102.565	0.000
Experience (exp)	0.035	0.005	0.724	7.563	0.000
Exp * exp	0.000	0.000	−0.513	−5.154	0.000
Secondary	0.331	0.070	0.299	4.754	0.000
Higher	0.740	0.072	0.670	10.290	0.000
$R = 0.444$, $R^2 = 0.198$, $F = 91.221$, $dF = 4$					

Source: ELSTAT (Hellenic Statistical Authority),
https://www.statistics.gr/documents/20181/fae98df5-d44a-6a13-a681-75d24561fac4.

So, the rate of return is 10.23%.

According to Table 3 and Table 4, the returns to higher education are higher for women than for men (Montenegro & Patrinos, 2021; Psacharopoulos & Patrinos, 2018).

5. Discussion and Conclusion

There has been a tremendous increase in schooling attainment in recent decades. As schooling in an economy increases, the returns to schooling tend to decrease (Trostel et al., 2002). The results shown from the above studies specify that the rates of return on higher education fell to the value of 8.63% (overall)—men receive 8.4% returns and women receive 10.23% returns on higher education in Greece. Europe and Central Asia have higher returns at the tertiary level of education (just over 10%). Men receive 10.6% returns and the gap between men and women has increased with women's returns at 12.4% (Montenegro & Patrinos, 2021, Table 4). The returns to higher education are higher in high-income economies (Psacharopoulos & Patrinos, 2018, Table 4). This means that corrective educational reforms need to be made that will further upgrade the quality of the higher education provided in Greece (Magoula & Psacharopoulos, 1999).

The rising rate of returns on education has been associated with the increase in education funding, it is considered necessary to take them into account when planning further education funding. Undoubtedly, the challenges facing higher education require more governance and funding.

Finally, since the rates of return on higher education are falling, as the demand for additional years of higher education increases, it is deemed necessary to continue the study of the rates of return on education for holders of Master's and Ph.D. diplomas in Greece.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Appendix

Table A1. Demand for higher education in Greece (1962-2022).

Years	Students' applicants	Admitted students
1962	30,000	11,255
1963	34,000	13,183
1964	38,000	23,119
1965	40,000	15,157
1966	41,000	14,443
1967	43,000	18,330
1968	32,864	14,651
1969	36,654	12,515
1970	38,580	15,179
1971	37,071	14,339
1972	38,866	15,932
1973	47,792	19,171
1974	54,955	26,597
1975	66,113	22,727
1976	64,872	14,549
1977	72,481	15,720
1978	80,849	18,784
1979	86,553	17,801
1980	84,468	18,733
1981	82,240	18,796
1982	94,000	22,081
1983	97,553	24,058
1984	129,374	30,001
1985	149,246	29,027
1986	156,289	28,943
1987	151,129	28,157
1988	132,727	27,989
1989	127,430	22,970
1990	124,658	22,760
1991	128,295	22,500
1992	140,514	22,000
1993	146,475	21,600

Continued

1994	154,116	22,000
1995	153,547	22,800
1996	151,499	23,580
1997	169,750	25,940
….	…	…
2000	138,180	85,531
….	….	…
2005	129,380	81,021
…	…	…
2010	106,189	84,368
…	…	…
2015	104,616	70,988
…	…	…
2020	105,420	81,413
2021	103,468	63,239
2022	99,305	61,682

Source: Magoula (1999b: p. 103, Table 1) and Ministry of Education, Religious Affairs, and Sports: Ministerial Decisions: Φ. 253.1/2000, Φ. 253.1/2005, Φ. 253.1/2010, Φ. 253.1/2015, Φ. 253.1/2020, Φ. 253.1/2021 and Φ. 253.1/2022.