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Returns to Education in the Public and Private Sectors: Europe and Central Asia

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The returns to schooling are estimated for 28 European and Central Asian countries using the Mincerian function. Our results show that while the public sector pays on average more than the private sector, the effect of education on earnings is stronger in the private sector. However, the returns to tertiary education are higher in the private sector.

Keywords: returns to education; wage differentials; public–private; Europe

Subject classification codes: JEL I21, J31

I. Introduction

The returns to education have been estimated for many years. The most recent analyses looked at 160 economies and estimated that every year of schooling increased earnings by 10 percent a year on average (Montenegro and Patrinos 2021; Psacharopoulos and Patrinos 2018).

Estimates by sector of the economy have been estimated (Bender 1998; Psacharopoulos 1983; Smith 1976a, 1976b). It is a stylized fact that the returns for those who work in the private (competitive) sector of the economy are higher than in the public (noncompetitive) sector. The public and private sectors may have different objectives; the public sector may want to pay more for less skilled workers for political reasons and might be reluctant not to pay too much for higher skilled workers so as not to make them leave the private sector (Katz and Krueger 1983; Paparetrou 2006). The returns for those working in the private sector of the economy are higher than for those working in the public sector. These findings suggest that where productivity matters, education is recognized. This work focuses on countries in Europe and Central Asia and looks at returns to education for workers in the public and private sectors of the economy and

makes appropriate comparisons. It also provides a test of the human capital versus screening views of investment in education, and suggests that the human capital, productivity enhancing approach is supported by the data.

Attempts have been made to test the screening hypothesis that better-educated individuals earn more because education serves as a credential which signals higher productivity (Layard and Psacharopoulos 1974). A particular method of testing screening proposed by Psacharopoulos (1979) offers a theoretical distinction weak and strong versions. The test involves comparing returns by sector. The key is a distinction between competitive and non-competitive sectors of the economy. Public administration is taken as the non-competitive sector and the private sector as the competitive one. It is assumed that wages could exceed productivity in the public sector but not in the competitive private sector. Where the effects of a screen persist over time the screen is a strong one, while where the effects dissipate the screen is a weak one. The test comes down to estimating earnings functions for the competitive and the non-competitive sectors of the economy and comparisons of the rates of return to education in those two sectors, although caution is recommended when comparing two non-random samples (Oosterbeek 1993; but see Brown and Sessions 1999; Adamchik and Bedi 2000). Since then, a number of other researchers have adopted the test explicitly or some variant of it to test the strong version. Some of these tests (see, Arabsheibani and Rees 1998; Lambropoulos 1992; Tucker 1986) show evidence against strong screening.

II. Methodology

To estimate the private return to education we use the Mincer (1974) earnings function. Denoting the public sector by (1) and the private sector by (2), we express earnings functions as:

$$\ln W_1 = \beta'_1 X + u_1 \quad (1)$$

$$\ln W_2 = \beta'_2 X + u_2 \quad (2)$$

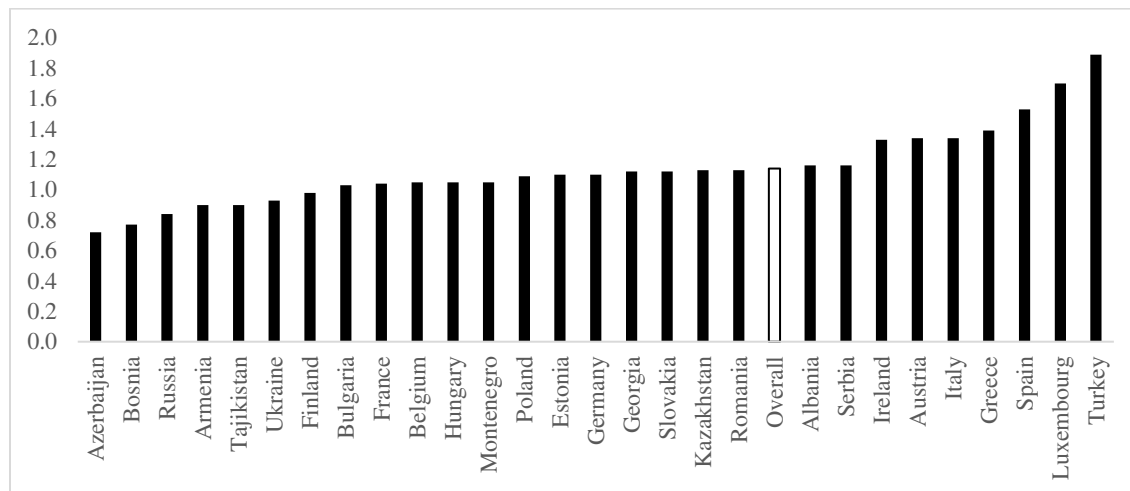
where $\ln W_i$ is the natural log of weekly wages in sector i , X is a vector of human capital variables with β_i being the associated vector of coefficients and u_i is the error term.

We use the same methodology as Montenegro and Patrinos (2021). This effort holds constant the definition of the dependent variable, the set of controls, sample definition and the estimation method for all surveys. The returns to schooling are estimated by public and private sectors separately for 28 ECA countries represented in the International Income Distribution Database (I2D2) compiled by the World Bank and the Luxembourg Income Study, mostly for the years between 2011 and 2020, and with some older surveys due to availability. Overall returns to another year of schooling by sector and to sub-sector of education by private/public employment sector are estimated.¹

III. Results

The public sector pays on average more than the private sector (see Figure 1). This is consistent with the literature (see, Bender 1998; Depalo et al. 2015). The unadjusted wage differential is 14 percent higher in the public sector. Most workers are employed in the private sector, at 67 percent, but there are a few countries where the public sector dominates.

Figure 1. Overall public:private mean earnings

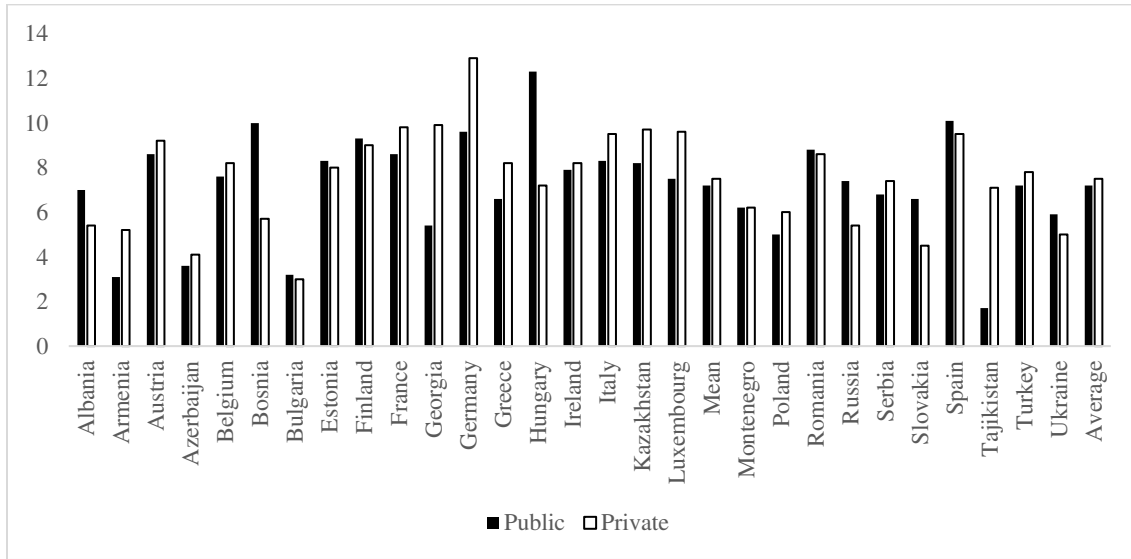


The pay determination in both public and private sectors is consistent with the human capital model (see Annex Table 1). However, the effect of education on earnings is stronger in the private sector. This implies the private sector recognizes the higher productivity of the educated employee where market returns matter. The returns to schooling are higher in the private sector, at 7.5 percent, than in the public sector, at 7.2 percent (Figure 2). Overall, the estimates are slightly lower than what is reported in Montenegro and Patrinos (2021) but similar to the findings in Psacharopoulos and Patrinos (2018).

In fact, in 18 cases returns are higher in the private sector; for another 6 countries, the differences are minimal; only in 5 cases are the returns higher in the public sector. These findings are in line with the literature (see, for example, Kanellopoulos 1997). In Turkey, contrary to many findings in other countries, private returns to those working in the public sector are higher than those in the private sector, and private returns to those who followed the vocational track in secondary education are higher than those in the

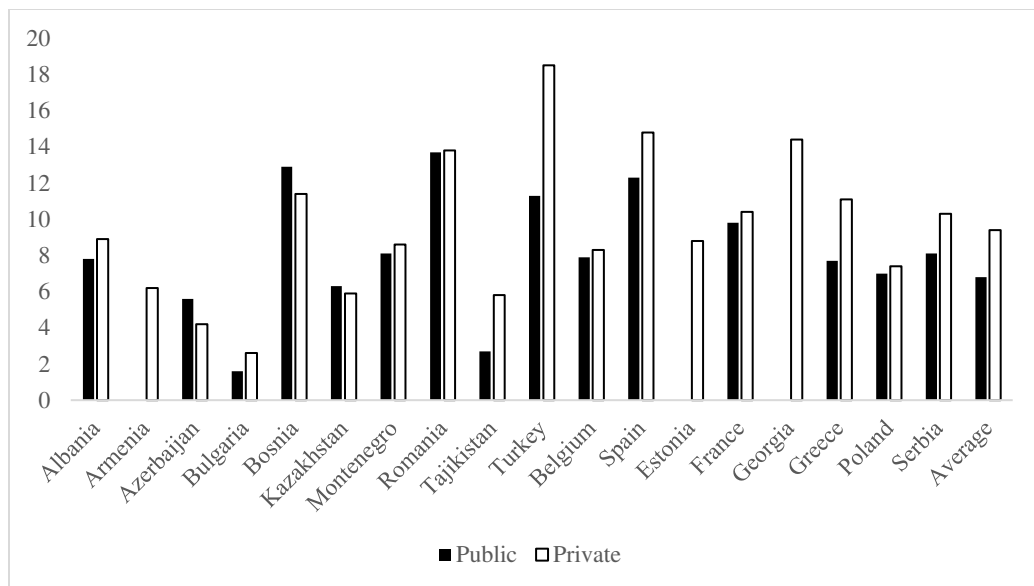
general academic track (Patrinos et al. 2021); however, that’s an aberration even for Turkey (Akhmedjonov and Izgi 2012).

Figure 2. The returns to schooling by economic sector



Overall, returns are highest at the tertiary level; in terms of private-public differences: the returns are higher in the private sector, at 9.5 vs. 6.8 percent in the public sector. This is consistent with the literature (see, for example, Depalo et al. 2015). The returns to experience are higher in the private sector.

Figure 3. The returns to schooling by economic sector at the tertiary level



IV. Conclusion

The returns to schooling in the private and public sectors were estimated. The public sector pays on the average more than the private sector. On average, most workers are employed in the private sector. Nevertheless, a sizable number of workers are in the public sector and significant amounts of public expenditure go towards their salary. However, the effect of education on earnings is stronger in the private sector. This implies the private sector recognizes the higher productivity of the educated worker. Also, overall returns are highest at the tertiary level; in terms of private-public differences: the returns are higher in the private sector. The returns to labor market experience are higher in the private sector. This paper confirms the human capital view of education as opposed to the screening hypothesis.

This paper gives preliminary evidence that wage determination in the competitive sector is determined by economic variables, such as education, and that strong screening is not as widespread as in the public sector where wages can deviate from marginal

productivity not only initially but persistently over the employee's career. It suggests that in cases where productivity matters, education does continue to have a value after the employee has been under observation for some time (the latter considered by the inclusion of the experience variable in the regressions).

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Notes

1. Detailed country results are omitted for space considerations but available upon request.

Disclosure statement

No potential conflict of interest was reported by the authors.

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References

Adamchik, V. and A. Bedi. 2000. "Wage differentials between the public and the private sectors: Evidence from an economy in transition." *Labour Economics* 7(2): 203-224.

- Akhmedjonov, A. and B. Izgi. 2012. "Does it pay to work in the public sector in Turkey?" *Applied Economics Letters* 19(10).
- Arabsheibani, G. and H. Rees. 1998. "On the weak vs strong version of the screening hypothesis: a re-examination of the P-test for the UK." *Economics of Education Review* 17(2): 189-192.
- Bender, K. 1998. "The central government-private sector wage differential." *Journal of Economic Surveys* 12(2):177-220.
- Brown, S. and J.G. Sessions. 1999. "Education and employment status." *Economics of Education Review* 18(4): 397-404.
- Depalo, D., R. Giordano and E. Paparetrou. 2015. "Public-private wage differentials in euro-area countries." *Empirical Economics* 49: 985-1015.
- Kanellopoulos, C. 1997. "Public-private wage differentials in Greece." *Applied Economics* 29: 1023-32.
- Katz, L. and A. Krueger. 1993. "Public sector pay flexibility: labor market and budgetary considerations." In OECD, *Pay Flexibility in the Public Sector*, pp. 43-77.
- Lambropoulos, H. 1992. "Further evidence of the weak and strong versions of the screening hypothesis in Greece." *Economics of Education Review* 11: 61-65.
- Layard, R. and G. Psacharopoulos. 1974. "The screening hypothesis and the returns to education." *Journal of Political Economy* 82(5) 985-998.
- Mincer, J. 1974. *Schooling, Experience, and Earnings*. New York: National Bureau of Economic Research and Columbia University Press.

- Montenegro, C. and H. Patrinos, H.A., 2021. "A data set of comparable estimates of the private rate of return to schooling in the world, 1970–2014." *International Journal of Manpower*.
- Oosterbeek, H. 1993. "Evidence on Screening: A Comment." *Economics of Education Review* 12(1): 89-90.
- Paparetrou, E. 2006. "The unequal distribution of the public-private sector wage gap in Greece: evidence from quantile regression." *Applied Economics Letters* 13(4): 205-210.
- Patrinos, H., G. Psacharopoulos and A. Tansel. 2021. "Private and Social Returns to Investment in Education: the Case of Turkey with Alternative Methods." *Applied Economics* 53(14): 1638-1658.
- Psacharopoulos, G. 1983. "Education and private versus public sector pay." *Labour and Society* 8(2): 123-134.
- Psacharopoulos, G. 1979. "On the weak versus the strong version of the screening hypothesis." *Economics Letters* 4(2): 181-185.
- Psacharopoulos, G. and H. Patrinos. 2018. "Returns to investment in education: a decennial review of the global literature." *Education Economics* 26(5): 445-458.
- Smith, S. 1976a. "Pay differentials between federal government and private sector workers." *Industrial and Labor Relations* 29: 179-197.
- Smith, S. 1976b. "Government wage differentials by sex." *Journal of Human Resources* 11: 185-199.
- Tucker, I. 1986. "Evidence on the weak and strong versions of the screening hypothesis in the United States." *Economics Letters* 21, 391-404.

Annex Table 1: Cross Country Evidence on the Returns to Schooling

		Return on year of schooling		Return to tertiary education	
		Private sector	Public Sector	Private sector	Public Sector
Albania	2012	5.39	7.02	8.88	7.77
Armenia	2016	5.19	3.14	6.15	0.00
Azerbaijan	2008	4.08	3.55	4.17	5.55
Bulgaria	2001	3.03	3.21	2.60	1.65
Bosnia	2001	5.66	10.00	11.40	12.90
Kazakhstan	2010	9.73	8.20	5.90	6.30
Montenegro	2011	6.18	6.22	8.63	8.07
Romania	2010	8.62	8.79	13.82	13.70
Russia	2016	5.40	7.38	3.78	
Tajikistan	2013	7.05	1.67	5.80	2.67
Turkey	2010	7.75	7.18	18.53	11.32
Ukraine	2013	5.00	5.91	5.27	
Austria	2019	9.24	8.62		
Belgium	2017	8.16	7.59	8.30	7.93
Germany	2018	12.90	9.60		
Spain	2016	9.53	10.10	14.82	12.33
Estonia	2016	8.01	8.30	8.82	0.00
Finland	2016	9.00	9.26		
France	2010	9.81	8.57	10.40	9.78
Georgia	2019	9.91	5.40	14.38	0.00
Greece	2016	8.15	6.64	11.10	7.68
Hungary	2007	7.24	12.30		
Ireland	2000	8.15	7.95		
Italy	2016	9.46	8.26	10.77	
Luxembourg	2013	9.62	7.49	14.65	
Poland	2020	6.01	4.99	7.35	7.02
Serbia	2016	7.44	6.77	10.30	8.13
Slovakia	1992	4.54	6.62		
<i>Mean</i>		7.62	7.19	9.36	6.82

Regression specification includes controls for experience and experience squared.