

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

Claudio M. MONTENEGRO
University of Chile, Santiago, Chile
World Bank¹, Washington, USA
cmontenegro@worldbank.org

Harry Anthony PATRINOS
Europe and Central Asia, World Bank, Washington, USA
hpatrinos@worldbank.org

Article's History:

Received 5th of January, 2023; Received in revised form 17th of February, 2023; Accepted 19th of March, 2023;
Published 30th of March, 2023.

Copyright© 2023 The Author(s). This article is distributed under the terms of the license [CC-BY 4.0.](https://creativecommons.org/licenses/by/4.0/), which permits any further distribution in any medium, provided the original work is properly cited.

Suggested Citation:

Montenegro, C.M., and Patrinos, H.A. (2023). Returns to Education in the Public and Private Sectors: Europe and Central Asia. *Journal of Applied Economic Sciences*, Volume XVIII, Spring, 1(79), 21 - 26.
[https://doi.org/10.57017/jaes.v18.1\(79\).03](https://doi.org/10.57017/jaes.v18.1(79).03)

Abstract:

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.

JEL Classification: I21; J31.

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% a year on average (Psacharopoulos and Patrinos, 2018). Here we present estimates of the returns in the public and private sectors in Europe and Central Asia using a new database (Montenegro and Patrinos, 2021).

Estimates by sector of the economy have been estimated (Bender, 1998; Psacharopoulos, 1983; Smith, 1976a; Smith, 1976b). It is a stylized fact that the returns for those who work in the private sector of the economy are higher than in the public 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). 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 comparisons². 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 between weak and strong versions. The test involves comparing returns by sector.

¹ World Bank, 1818 H Street NW, Mail Stop MC 7-711, Washington, DC, 20433, USA

² Based on an updated version of the discussion paper <https://docs.iza.org/dp15516.pdf>, see Montenegro and Patrinos (2022).

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 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 private and public 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, several 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.

1. Research 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:

$$\ln W_1 = \beta_1 X + u_1 \quad (1)$$

$$\ln W_2 = \beta_2 X + u_2 \quad (2)$$

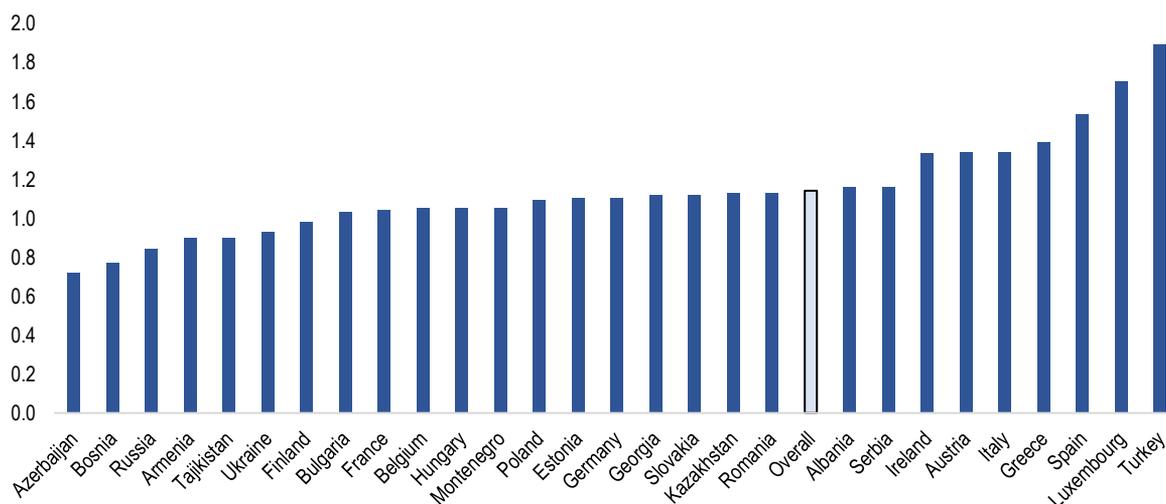
where: $\ln W_i$ is the natural log of weekly wages in sector i , X is a vector of human capital variables with β_i being the associated vector of coefficients and u_i is the error term.

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 estimated³.

2. Findings and 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% higher in the public sector. Most workers are employed in the private sector, at 67%, but there are a few countries where the public sector dominates.

Figure 1. Overall public: private mean earnings



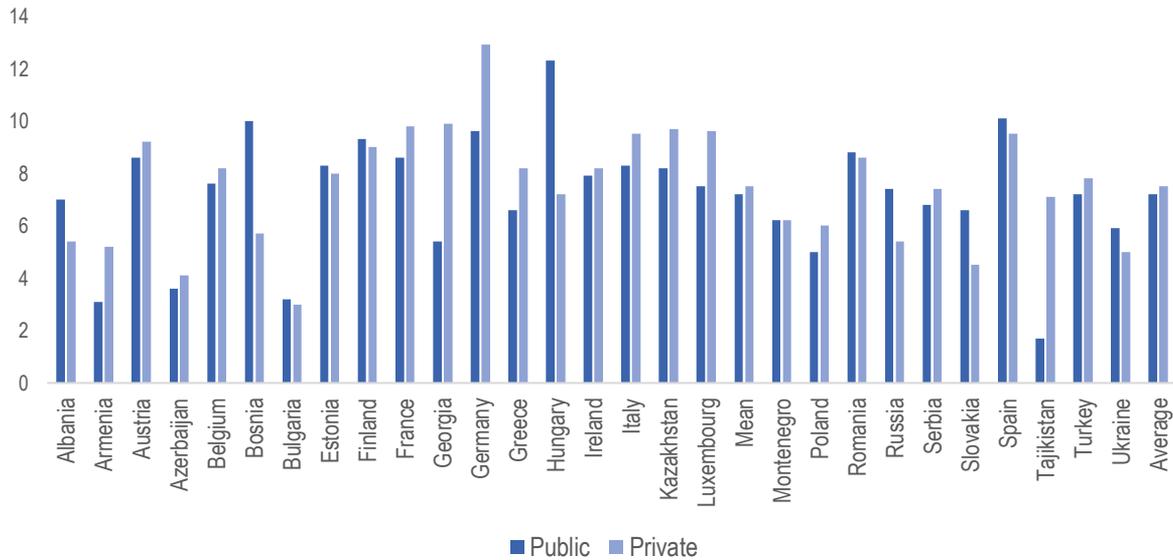
The pay determination in both public and private sectors is consistent with the human capital model (see Annex, Table 1). However, the effect of education on earnings is stronger in the private sector. This implies the private sector recognizes the higher productivity of the educated employee where market returns matter. The

³ Detailed country results are omitted for space considerations but available upon request.

returns to schooling are higher in the private sector, at 7.5%, than in the public sector, at 7.2% (Figure 2). Overall, the estimates are slightly lower than what is reported in Montenegro and Patrinos (2021) but like the findings in Psacharopoulos and Patrinos (2018).

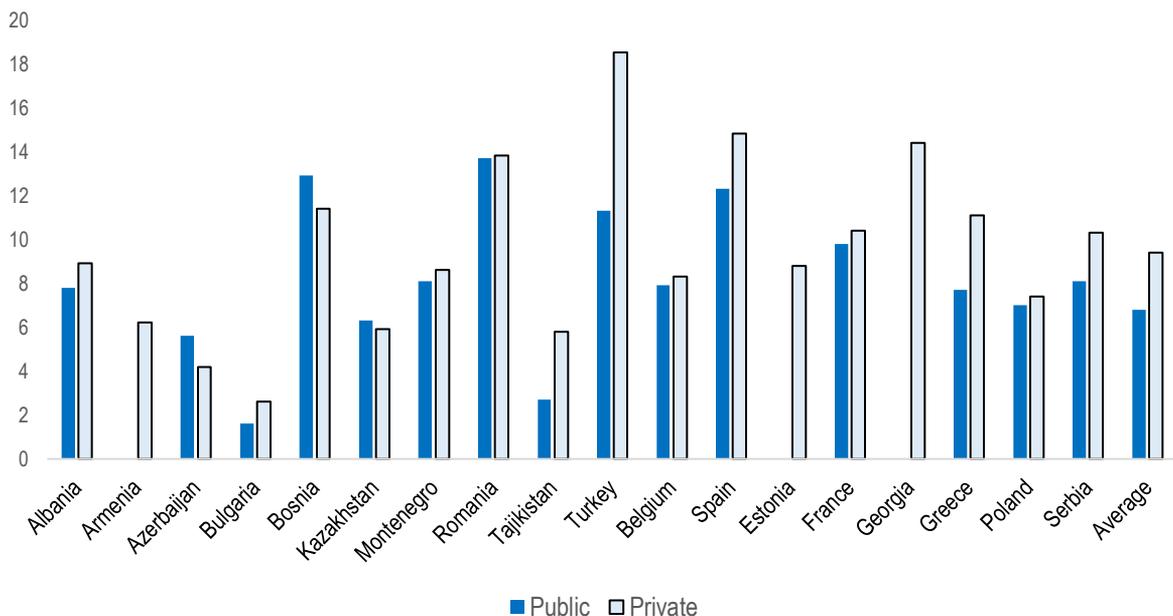
In fact, in 18 cases returns are higher in the private sector; for another 6 countries, the differences are minimal; only in 5 cases are the returns higher in the public sector. These findings are in line with the literature (see, for example, Kanellopoulos, 1997). In Turkey, contrary to many findings 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% 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



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 private 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).

Conflict of Interest Statement

The author declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

References

- [1] Adamchik, V. and Bedi, A. (2000). Wage Differentials between the Public and the Private Sectors: Evidence from an Economy in Transition. *Labour Economics*, 7(2), 203-224.
- [2] Akhmedjonov, A. and Izgi, B. (2012). Does it Pay to Work in the Public Sector in Turkey? *Applied Economics Letters*, 19(10), 909-913.
- [3] Arabsheibani, G. and Rees, H. (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.
- [4] Bender, K. (1998). The Central Government–Private Sector Wage Differential. *Journal of Economic Surveys*, 12(2), 177-220.
- [5] Brown, S., and Sessions, J. G. (1999). Education and Employment Status. *Economics of Education Review*, 18(4), 397-404.
- [6] Depalo, D., Giordano, R., and Paparetrou, E. (2015). Public-Private Wage Differentials in Euro-area Countries. *Empirical Economics*, 49, 985-1015.
- [7] Kanellopoulos, C. (1997). Public-Private Wage Differentials in Greece. *Applied Economics*, 29, 1023–32.
- [8] Katz, L. and Krueger, A. (1993). Public Sector Pay Flexibility: Labor Market and Budgetary Considerations. In OECD, *Pay Flexibility in the Public Sector*, pp. 43–77.
- [9] Lambropoulos, H. (1992). Further Evidence of the Weak and Strong Versions of the Screening Hypothesis in Greece. *Economics of Education Review*, 11, 61-65.
- [10] Layard, R. and Psacharopoulos, G. (1974). The Screening Hypothesis and the Returns to Education. *Journal of Political Economy*, 82(5), 985-998.
- [11] Mincer, J. (1974). *Schooling, Experience, and Earnings*. New York: National Bureau of Economic Research and Columbia University Press.
- [12] Montenegro, C.E., and 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*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/IJM-03-2021-0184>
- [13] Montenegro, C. E., and Patrinos, H. A. (2022). Returns to Education in the Public and Private Sectors: Europe and Central Asia. *IZA Discussion Paper No. 15516*. <https://ssrn.com/abstract=4204334>
- [14] Oosterbeek, H. (1993). Evidence on Screening: A Comment. *Economics of Education Review*, 12(1), 89-90.

- [15] 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.
- [16] Patrinos, H., Psacharopoulos, G., and Tansel, A. (2021). Private and Social Returns to Investment in Education: The Case of Turkey with Alternative Methods. *Applied Economics*, 53(14), 1638-1658. <https://doi.org/10.1080/00036846.2020.1841086>
- [17] Psacharopoulos, G. (1983). Education and private versus public sector pay. *Labour and Society*, 8(2), 123-134.
- [18] Psacharopoulos, G. (1979). On the weak versus the strong version of the screening hypothesis. *Economics Letters*, 4(2), 181-185.
- [19] Psacharopoulos, G. and H. Patrinos. (2018). Returns to investment in education: A decennial review of the global literature. *Education Economics*, 26(5), 445-458. <https://doi.org/10.1080/09645292.2018.1484426>
- [20] Smith, S. (1976a). Pay differentials between federal government and private sector workers. *Industrial and Labor Relations*, 29, 179-197.
- [21] Smith, S. (1976b). Government wage differentials by sex. *Journal of Human Resources*, 11, 185-199.
- [22] 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

Country	Year	Return on additional year of schooling		Return to tertiary education		N
		Private	Public	Private	Public	
Albania	2012	5.39	7.02	8.88	7.77	3,255
Armenia	2016	5.19	3.14	6.15	0.00	3,909
Azerbaijan	2008	4.08	3.55	4.17	5.55	2,297
Bulgaria	2001	3.03	3.21	2.60	1.65	1,675
Bosnia	2001	5.66	10.00	11.40	12.90	3,460
Kazakhstan	2010	9.73	8.20	5.90	6.30	15,011
Montenegro	2011	6.18	6.22	8.63	8.07	4,325
Romania	2010	8.62	8.79	13.82	13.70	17,371
Russia	2016	5.40	7.38	3.78	N/A	4,680
Tajikistan	2013	7.05	1.67	5.80	2.67	2,482
Turkey	2010	7.75	7.18	18.53	11.32	85,813
Ukraine	2013	5.00	5.91	5.27	N/A	7,895
Austria	2019	9.24	8.62	N/A	N/A	4,769
Belgium	2017	8.16	7.59	8.30	7.93	4,400
Germany	2018	12.90	9.60	N/A	N/A	13,460
Spain	2016	9.53	10.10	14.82	12.33	11,136
Estonia	2016	8.01	8.30	8.82	0.00	5,887
Finland	2016	9.00	9.26	N/A	N/A	8,433
France	2010	9.81	8.57	10.40	9.78	43,943
Georgia	2019	9.91	5.40	14.38	0.00	2,309
Greece	2016	8.15	6.64	11.10	7.68	10,833
Hungary	2007	7.24	12.30	N/A	N/A	1,218
Ireland	2000	8.15	7.95	N/A	N/A	2,429
Italy	2016	9.46	8.26	10.77	N/A	4,277
Luxembourg	2013	9.62	7.49	14.65	N/A	4,018
Poland	2020	6.01	4.99	7.35	7.02	27,193
Serbia	2016	7.44	6.77	10.30	8.13	4,773
Slovakia	1992	4.54	6.62	N/A	N/A	18,354
<i>Mean</i>		7.62	7.19	9.36	6.82	

Note: Regression specification includes controls for experience and experience squared; N/A: could not be computed because of sample size.