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Returns to Education in the Russian Federation: Towards Evidence Based Decision Making with Social and Private Returns to Education

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Data and Code
Thanks are due to the Ministry of Education and the Ministry of Finance for making the data available regarding graduate earnings and college and university income and expenditures. The code used for this paper is made freely available for all researchers at `https://bitbucket.org/zagamog/edreru/src/master/`

This paper presents a preliminary analysis of a dataset distributed by the Ministry of Education of the Russian Federation that provides information on graduate salaries. The data is merged with information on income and fee revenue of colleges and universities to provide estimates of costs and benefits at an institutional level and private and social returns to education at a regional level. As the length of the data series on graduate earnings will grow over time, the estimates presented in this paper can be updated to provide sharper estimates of the costs and benefits of attending a particular institution.

KEYWORDS
Returns to Education, Higher Education, Cost-Benefit Analysis
JEL Codes: I23, I26

1 | DESCRIPTION OF DATA

The Ministry of Education provides information regarding the salaries obtained by graduates and other related information at the website "http://graduate.edu.ru". A key purpose of this website is to provide accurate information to prospective university students and their families about the prospects of graduates from each of the universities or colleges. The Ministry of Finance collects information from all education establishments and others providing public

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service as a means to foster citizen engagement and accountability.This information includes details about revenue and income streams. This paper presents analysis from the merger of these two databases. The content of the data is presented in this section. Subsequent sections provide analysis and interpretation.

1.1 | Graduate.edu portal

Graduate.edu allows the registered users to download all desirable information about the earnings of college or university graduates in .xlsx format. By using that service we obtained data about the number of graduates in 2013 in each university and college and their corresponding salaries in 2014, 2015 and 2016. Our final set of data consists of 1909 colleges, 423 universities, and 2975 pairs of university-study areas with information about the graduates earning in them. We filtered out universities and colleges with less than 100 and 50 graduates in 2013, respectively. Salaries in 2014 and 2015 were adjusted to the prices of 2016.

	Mean	Std	Quantile 25%	Quantile 50%	Quantile 75%
College Graduates Avg. Earnings 2014	22408.41	6718.38	18213.59	20843.45	24744.95
College Graduates Avg. Earnings 2015	21035.93	6243.07	17172.41	19611.08	23374.58
College Graduates Avg. Earnings 2016	21585.56	6636.83	17359.00	20001.00	23944.00
					76.30
					02.99
					00.50

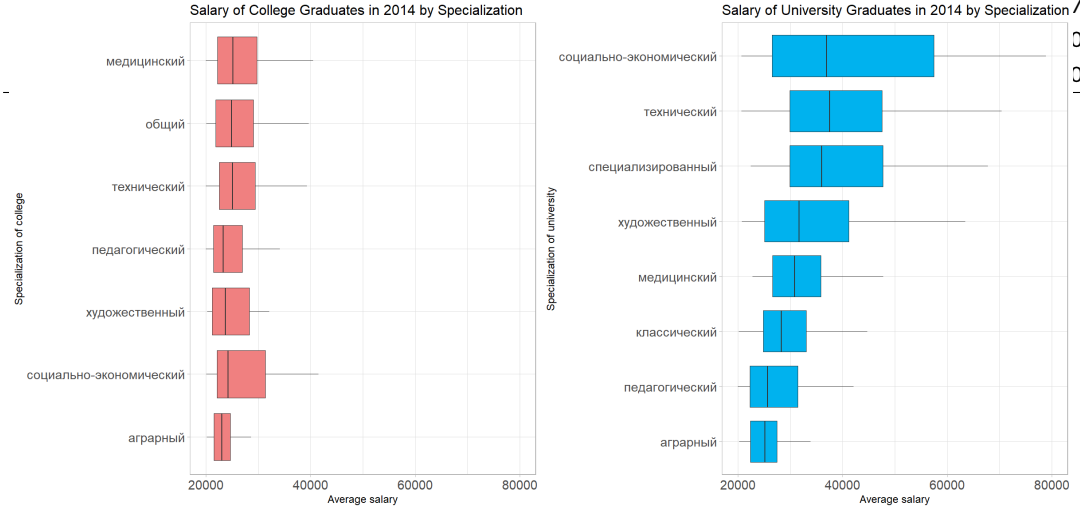

FIGURE 1.1 Earnings in 2014 by Specialization

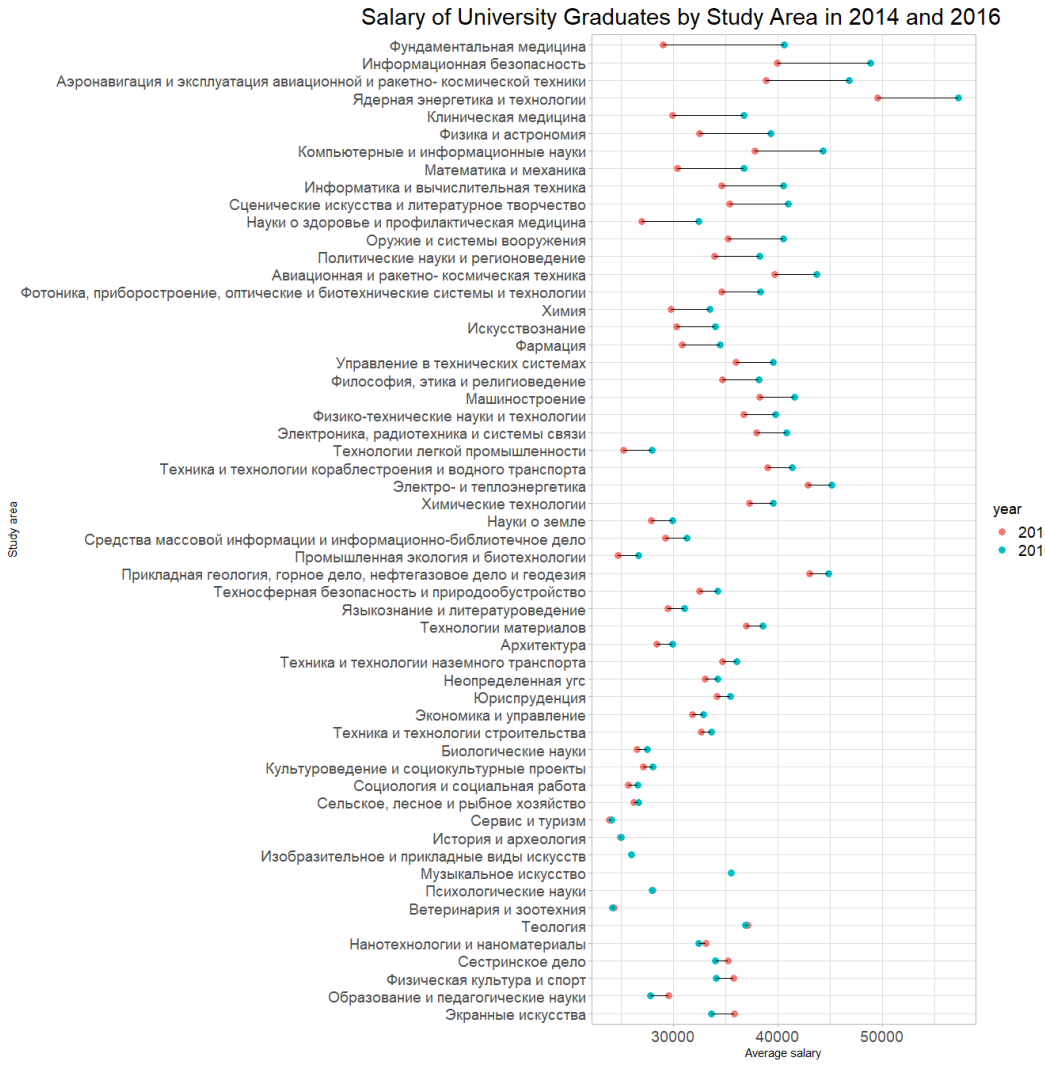

FIGURE 1.2 Earnings Growth 2014-16 by Specialization

1.2 | Bus.gov portal

We obtained financial data about the colleges and universities from the open data section on the https://bus.gov.ru. It contains information about the total cash receipts of an organization for a given year and provides data on the income subcategories, such as cash receipts from paid services, target subsidy, budget investments, state (municipal) tasks. In our research, we approximated fee payments through the information about cash receipts from the paid services and used it together with the number of graduates for the calculation of the private education cost. To estimate the social cost of education we used total cash receipts in an organization.

	Mean	Std	C
Number of College Graduates in 2013	176.31	133.39	
Total Cash Receipts in Colleges, mean 2012-2017	88499122.76	200088664.05	4
Cash Receipts from the Paid Services in Colleges, mean 2012-2017	12004524.72	24174678.97	
Cash Receipts from the Target Subsidy in Colleges, mean 2012-2017	10928188.61	68501579.61	
Cash Receipts from the Budget Investments in Colleges, mean 2012-2017	391006.37	3281730.14	
Cash Receipts from the State (Municipal) Tasks in Colleges, mean 2012-2017	62185102.87	78598656.84	3
Social Cost for Colleges	209009.22	376699.68	
Private Cost for Colleges	22514.60	26853.43	
Number of University Graduates in 2013	1653.40	1540.26	
Total Cash Receipts in Universities, mean 2012-2017	1584286956.47	2428205237.24	48
Cash Receipts from the Paid Services in Universities, mean 2012-2017	635645476.93	1093170696.05	13
Cash Receipts from the Target Subsidy in Universities, mean 2012-2017	219245815.86	307653669.29	7
Cash Receipts from the Budget Investments in Universities, mean 2012-2017	38817642.63	136401304.85	
Cash Receipts from the State (Municipal) Tasks in Universities, mean 2012-2017	658658759.84	1066074165.51	24
Social Cost for Universities	272583.61	282826.42	
Private Cost for Universities	102266.58	131717.09	

2 | INSTITUTIONAL RETURNS FOR COLLEGES AND UNIVERSITIES

Explain the method we are using with a couple of equations. We will cite Psacharopoulos 1995.

How many years to break even

Top/Bottom 10 as you have before also with column of break-even years

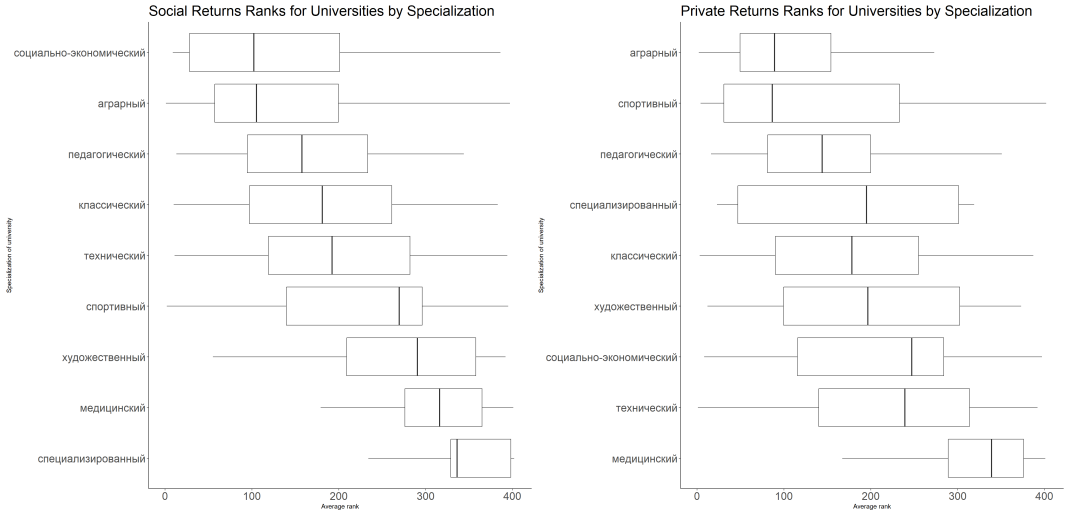

FIGURE 2.1 Soc Return Uni

And same for college

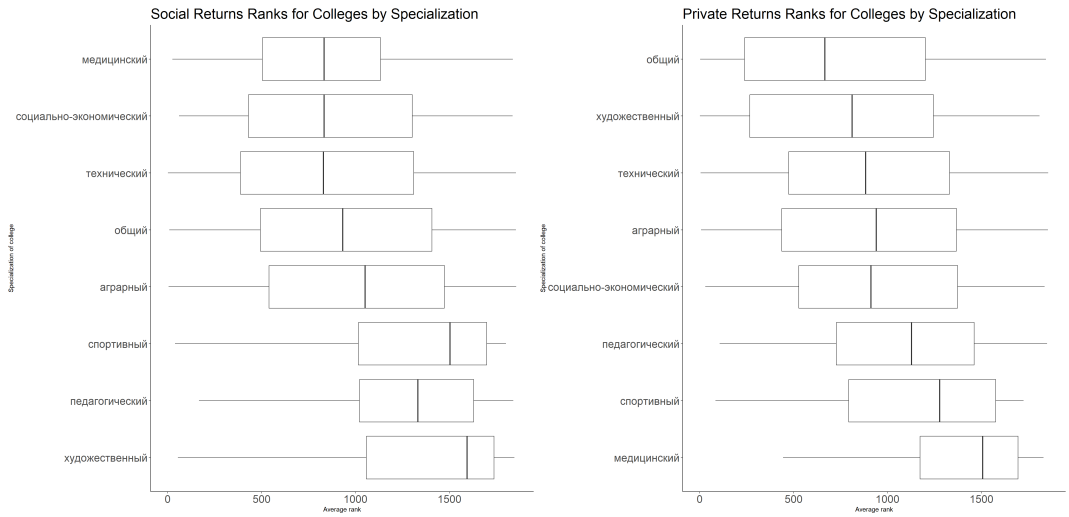

FIGURE 2.2 Priv Return Uni

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Nulla malesuada porttitor diam. Donec felis erat, congue non, volutpat at, tincidunt tristique, libero. Vivamus viverra fermentum felis. Donec nonummy pellentesque ante. Phasellus adipiscing semper elit. Proin fermentum massa ac quam. Sed diam turpis, molestie vitae, placerat a, molestie nec, leo. Maecenas lacinia. Nam ipsum ligula, eleifend at, accumsan nec, suscipit a, ipsum. Morbi blandit ligula feugiat magna. Nunc eleifend consequat lorem. Sed lacinia nulla vitae enim. Pellentesque tincidunt purus vel magna. Integer non enim. Praesent euismod nunc eu purus. Donec bibendum quam in tellus. Nullam cursus pulvinar lectus. Donec et mi. Nam vulputate metus eu enim. Vestibulum pellentesque felis eu massa.

3 | REGIONAL ESTIMATES OF SOCIAL AND PRIVATE RETURNS

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Here we calculate age earnings profiles at regional level from Rosstat = Let's use 2013 to 2018 average in real 2018 rubles for each age to calculate the profile.

Then we total the cost figures at institution level for that region to get our first 3 or 4 negative numbers for average private and social cost of education Then full method gives us returns. We could provide simulated errors but I don't see much point, we will just present the points in a snake diagram or whatever you call it regions arranged

by descending returns; one for college and one for universities.

If time allows, we will add about migration and something about quality from EGE score data.

References

Psacharopoulos, George. 1995. *The Profitability of Investment in Education: Concepts and Methods*. World Bank Washington, DC.

Appendix

TABLE A1 Results of Estimating Human Capital Depreciation for the Female sample, RLMS

	1994	**1998**	**2003**	**2006**	**2012**	**2018**
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	9.725***	3.786***	5.464***	6.946***	8.133***	8.767***
	(0.381)	(0.322)	(0.301)	(0.247)	(0.186)	(0.242)
Educ, years (S)	0.122***	0.153***	0.158***	0.118***	0.087***	0.066***
	(0.025)	(0.022)	(0.020)	(0.016)	(0.012)	(0.015)
Educ X Exper (TS)	−0.002*	−0.002***	−0.002**	−0.0002	−0.0001	0.0004
	(0.001)	(0.001)	(0.001)	(0.001)	(0.0005)	(0.001)
Exper (T)	0.074***	0.080***	0.055***	0.013	0.020**	0.020*
	(0.019)	(0.016)	(0.015)	(0.013)	(0.010)	(0.011)
Exper squared (T^2)	−0.001***	−0.001***	−0.001***	−0.0003**	−0.0005***	−0.001***
	(0.0002)	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)
Observations	1,645	1,667	2,093	2,630	4,057	3,312
R^2	0.051	0.089	0.110	0.139	0.104	0.092
Adjusted R^2	0.049	0.087	0.108	0.138	0.103	0.091
Residual Std. Error	0.853	0.728	0.731	0.664	0.641	0.597
F Statistic	22.179***	40.520***	64.342***	106.385***	117.366***	83.993***

Note: *p<0.1; **p<0.05; ***p<0.01

TABLE A2 Results of Estimating Human Capital Depreciation for the Male sample, RLMS

	1994	**1998**	**2003**	**2006**	**2012**	**2018**
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	10.357***	5.029***	7.334***	8.067***	8.771***	9.094***
	(0.433)	(0.360)	(0.282)	(0.243)	(0.157)	(0.185)
Educ, years (S)	0.136***	0.123***	0.080***	0.077***	0.077***	0.077***
	(0.028)	(0.024)	(0.019)	(0.016)	(0.010)	(0.012)
Educ X Exper (TS)	−0.002*	−0.001	0.0004	−0.0003	−0.0004	−0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.0005)	(0.001)
Exper (T)	0.054**	0.032*	0.002	0.007	0.035***	0.037***
	(0.023)	(0.017)	(0.014)	(0.013)	(0.009)	(0.010)
Exper squared (T^2)	−0.001***	−0.0004**	−0.0003*	−0.0003*	−0.001***	−0.001***
	(0.0003)	(0.0002)	(0.0002)	(0.0001)	(0.0001)	(0.0001)
Observations	1,392	1,433	1,763	2,170	3,360	2,800
R^2	0.057	0.070	0.078	0.074	0.153	0.110
Adjusted R^2	0.054	0.067	0.076	0.072	0.152	0.108
Residual Std. Error	0.951	0.803	0.754	0.688	0.598	0.570
F Statistic	20.989***	26.879***	37.362***	43.281***	151.868***	86.125***

Note: *p<0.1; **p<0.05; ***p<0.01

References

Psacharopoulos, George. 1995. *The Profitability of Investment in Education: Concepts and Methods*. World Bank Washington, DC.