Skills and Returns to Education in the Russian Federation: Policy Note

1 | MAIN MESSAGES

Objective:

The objective of this ASA was "to develop policy recommendations for the Russian Federation based on a detailed analysis of the returns to education and identification of feasible pathways for robust growth in Russia's human capital wealth". The second part of identifying feasible pathways was perhaps stated too ambitiously. The study does include elements of possible future strategy work with priority regions as well as a potentially very useful idea for individual universities and colleges.

Findings:

1. Returns to Education increased in the beginning of the 2000s but then started to decline to reach about 8% now, below the EU average of 10%; Part of this tendency can be explained by post-schooling depreciation of human capital.
2. Female returns to schooling higher than males.
3. Returns to education vary widely across region, with policy implications for economic development, especially for ten high priority depressed regions.
4. Matching data about graduate earnings and college and university costs is currently viable and can be very useful for potential students and to incentivize quality improvements for tertiary education institutions.

Recommendations:

1. *Education quality and innovation policy:* The Russian Federation needs to make investments in the quality of education and enhance youth entrepreneurship to stem the tide of falling returns to education.
2. *Policy needs to work harder for gender parity:* Gender earning gaps remain wide and can be solved through policies to retain women?s interest in university education and learning opportunities at work.
3. *Lifelong learning for vocational education:* Supporting continuous investment in human capital through the career is more important now the base level of education in Russia is amongst the highest in the world; this will reduce depreciation, especially for vocational education.
4. *Strategy for priority regions:* A policy diagnostic based even on rough measures of labor market demand and supply is shown to capture regional diversity; refine the measures further for high priority regions to arrive at customized policy solutions, for example for three pilot regions of Pskov Oblast, Altai Krai and the Adygea Republic.
5. *Government transparency for citizen benefit:.* Revitalize the graduate.edu.ru website which has not been updated since 2016; Deepen the financial information collected from bus.gov.ru and annually update resulting data on institution level education returns to improve student choice and system efficiency.

2 | MOTIVATION

The motivation for this study is to provide inputs to the development strategy of the Russian Federation as set out in the May decree of 2018. Russia's development goal is to become one of the top five economies in the world and to reduce poverty by half. The importance of human capital to reach this goal is recognized in the government's policy pronouncements and the World Bank analytical work in support of government policy. A recently published World Bank study reported that Human capital only accounts for 46% of total wealth in Russia, as compared to the OECD average of 70% (Naikal et al. 2019). The report showed that even as growth rates of per capita wealth was ten times higher in Russia as compared to OECD, the gap in levels with OECD is still very wide. The per capita human capital wealth level at average for the OECD in 2014 was about USD 500,000 – five times that of Russia's 95,000 (measured in 2014 dollars). In order to catch up faster with the OECD, returns to education in Russia will need to be increased. This requires an understanding of the trends regarding the returns to education across time and across the considerable spatial diversity of the Russian Federation.

According to the Human Capital Index (HCI), the Russian Federation scores at 538 points in the Harmonized Learning Outcomes (HLO) global indicator, which is close to the advanced attainment and places Russia in the top-ten countries in terms of learning outcomes, though on the overall HCI, Russia is ranked 34th out of 157 countries. The Human Capital Index (HCI) measures the amount of human capital that a child born today can expect to attain by age 18 (Kraay 2018). The HCI shows that a child born in the Russian Federation today will be 73% as productive when she grows up as she could be if she enjoyed complete education and full health (*Human Capital Project: First Year Annual Progress Report (English)* 2019). In contrast to the excellent research focused on learning outcomes, this study is focused on the period after the age of 18, examining the empirical record of the labor market.

This study is based on four working papers. Working Paper 1 and Working Paper 3 of the study seek to meet the analytical need to understand the temporal and spatial patterns in the returns to education. The time trend described for the period 1994-2018 in Working Paper 1 requires an explanation. Moving beyond the traditional view of higher educational attainment of the population resulting in declining returns, Working Paper 2 explores the role played by depreciation of human capital. Working Paper 1 also indicates that individuals are responsive to changes in the returns of education, and that the proportion of women choosing university education has slightly declined in recent years. Working Paper 4 investigates more closely the institutional level returns to education, albeit with a limited short-term horizon of three years for which data was available. Institutional returns, that is, the prospective returns for graduates from a particular college or university are important for a number of reasons. Choice regarding college or university is one aspect; equally important is the prospect for systemic efficiency through informed competition for students. Student response to the dissemination of the institutional returns would help determine a future course of action.

3 | KEY FINDINGS

Trends regarding returns to education: 1994:2018

The study examined the trends in returns to education in the Russian Federation using a common methodology that has been used for more than 100 countries (Montenegro and Patrinos 2014; Psacharopoulos and Patrinos 2018). Figure 3 summarizes the results, showing rates of overall and gender-wise returns to education in Russia for the period 1994-2018: the percentage increment in a person's earnings due to one additional year of schooling. Overall, one can notice a moderate curved growth in returns to education in Russia, achieving its peak in the early 2000s (returns

of 9.8%), which is followed by a downward pattern (returns of 5.6% by 2018). The values of returns to schooling in recent years in Russia seem to lag far behind the global average of 9% (Psacharopoulos and Patrinos 2018). Education payoffs for women are higher than those of men, but the difference appears to have narrowed in recent years.

Regional variation in the returns to education

Regions show a wide variation in the returns to education, which is not surprising given the disparities in economic development across regions in the Russian Federation. However, it is somewhat unexpected to find that the regions with low returns include both the developed St. Petersburg with a highly educated population, and the not so developed Chechen Republic. Working Paper 3 provides a detailed list of the regions with their returns to university education and to vocational education. The working paper uses a methodology for calculating regional estimates that incorporates a number of other contextual factors about each region.
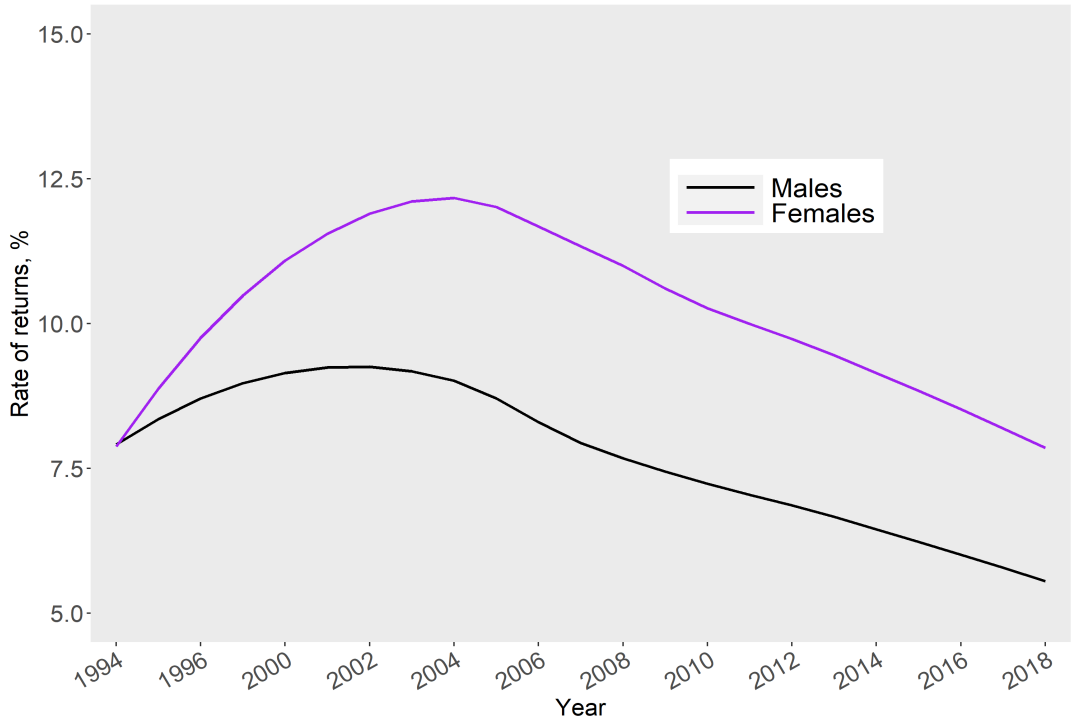
F I G U R E 1   Rates of Returns to Education in Russia, RLMS 1994-2018

Development policy typology from variations in regional context and returns to education

A recent World Bank report described the three main factors that explain the wide scale of diversity in Russia's regions, so that some regions have income levels that match Singapore or New Zealand, and others match Bolivia or Honduras: (i) the persistent Soviet legacy; (ii) diverse physical geography; and (iii) dominance of oil and gas in some regions (World Bank 2018). The report analyzed the determinants of the Economic Potential Index (EPI) of Russian regions: urbanization; the presence of high-tech industries; advanced human capital; and connectivity (access to markets). These four factors explain 60% of the variation in EPI. In this study we create a typology of regions using

various measures for the quantity and quality of labor demand and supply.

In this study, we build on the previous research by using an indicator of product complexity computed by Lyubimov, Gvozdeva, and Lysyuk 2018 to define policy context for a region. Lyubimov, Gvozdeva, and Lysyuk 2018 is based on a methodology that was initially proposed and implemented by the economists Ricardo Hausmann and César Hidalgo to capture the productive potential of an economy on the basis of the diversity of its products and exports (Hausmann and Hidalgo 2011; Hausmann et al. 2014). Lyubimov, Gvozdeva, and Lysyuk 2018 develop an "Economic Complexity Index" (ECI) utilizing production as well as export data. Working Paper 3 develops a policy context based on measures of labor demand quality and quantity as well as labor supply quality and quantity to better situate the differentials in rates of return. The analysis provides an opportunity to focus on high priority regions - depicted with red dots and their name shown in Figure 2
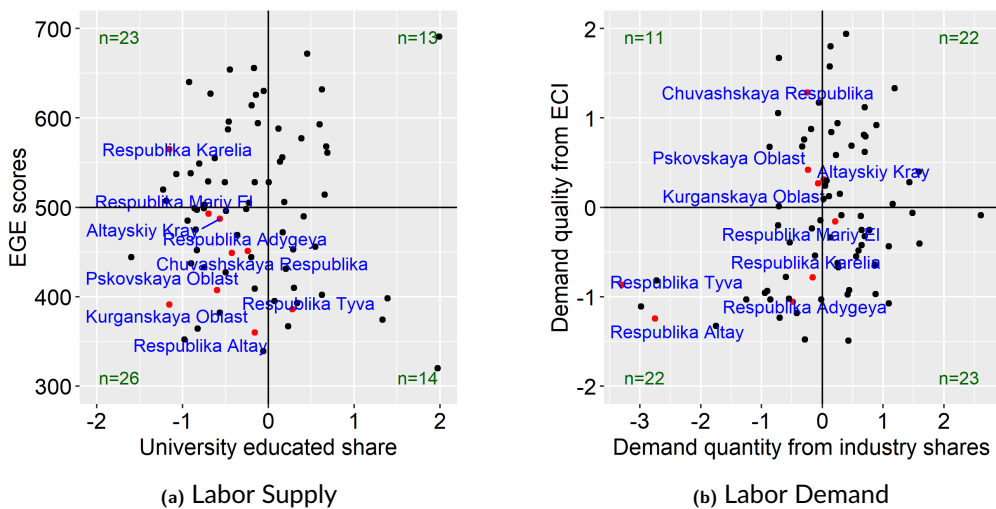

(a) Labor Supply   (b) Labor Demand

FIGURE 2   Ranking of Regions on Quantity and Quality dimensions

Depreciation detrimentally affects the returns to education

The study finds deprecation rates of human capital of 2%. Declining returns of education may be an effect of increasing depreciation. Like any other form of capital, human capital is also subject to depreciation. The literature identifies two kinds of depreciation - one is due to changes in technology that renders past learned skills less useful or even obsolete; the second is depreciation due to physical or psychological effects of the passage of time. Unfortunately, extracting depreciation rates from empirical data is not straightforward.

A relatively non-technical or intuitive understanding of depreciation can be obtained from Figure 3. The trajectory of earnings shows the usual concave profile for Higher Education. But the profiles for those with Secondary Education or Vocational education has a very early peak. Depreciation can be stemmed through repeated or regular human capital investment through a worker's lifetime. Some of the European countries including Denmark and Norway have developed strong lifelong learning systems (Jorgensen 2007; Midtsundstad and Nielsen 2019).

Institutional Level Social and Private Returns to Education

`Graduate.edu.ru` is the official graduate employment monitoring portal created and maintained by the Ministry of Education of the Russian Federation. The website was launched in 2015 to provide information targeted mainly to

FIGURE 3   RLMS Rounds 1998, 2006 and 2018

prospective graduates about the employment record of graduates from tertiary education institutions - including universities and vocational education colleges. The `bus.gov.ru` website is the official website of the Russian Federation for provision of information by public institutions. The objective as stated on the website is "to increase the openness and accessibility of information about state (municipal) institutions, as well as about their activities and property".

In Working Paper 4 of this study, the information from the two websites is merged to provide early stage social and private returns to education. Information is available for the total annual revenue from different sources including government transfers and grants, as well as revenue from service payments made by private individuals. For education institutions (colleges and universities) we assume that the revenues from service payments are tuition fee payments. The very short period of earnings information available (only 3 years) Table 1 shows that the most profitable educational investments, albeit with a three year horizon, may not always be the most famous ones!

Combining the costs and benefits side of investment in education will be useful not just for individual students but also for overall system efficacy and efficiency. Though multi-dimensional rankings are popular in some policy circles, transparent and simple social and private returns would spur healthy competition between institutes and regions to attract the best students.

4 | FUTURE AREAS OF INQUIRY

Empirical research to inform policy is necessarily tightly bound by time constraints. Some of the lines of inquiry that can be explored further are mentioned here. Particularly useful would be support to regional development strategies and their implementation, for instance with regard to the priority regions whose development is directly tied to the attainment of ambitious national development goals. The following future areas of inquiry are suggested:

- **Causal Effects of Educational Investments** Causal marginal effects of education on earnings can be computed (Carneiro, Heckman, and Vytlacil 2011; Heckman, Humphries, and Veramendi 2018). This has been done recently for the Russian Federation, in an academic study that explored the marginal effect of the expansion of university education in the 2000s (Belskaya, Sabirianova Peter, and Posso 2020). In an upcoming seminar where this study will be presented in June, 2020 another researcher will present a paper on the causal effect of the shift in Russian

TABLE 1 Social and Private Returns by Institution: Top and Bottom 10

social	private	Name	Region	Number graduates
Top 10 Colleges				
0.13	0.35	Samara Power Engineering College	Samarskaya Oblast	140
0.13	0.22	Tomsk Polytechnic Technical School	Tomskaya Oblast	306
0.12	0.24	Novocherkassk Geological Exploration College	Rostovskaya Oblast	244
0.12	0.28	Vilyui Technical School	Resp. Sakha (Yakutia)	156
0.11	0.21	Kiselevsky Mining College	Kemerovskaya Oblast	280
0.11	0.25	Higher Banking School	Saint-Petersburg	229
0.11	0.24	Industrial and Technological College	Saint-Petersburg	305
0.10	0.18	Perm Oil College	Permskiy Krai	171
0.10	0.30	Yakut Road Technical School	Resp. Sakha (Yakutia)	220
0.10	0.19	Sakhalin Indus. & Economic College	Sakhalinskaya Oblast	489
-0.01	0.01	Tomsk Industrial University	Tomsk	6655
Top 10 Universities				
0.07	0.09	Buryat State Agricultural Academy	Respublika Buryatia	415
0.05	0.09	Russian State Univ. of Tourism and Service	Moskovskaya Oblast	3019
0.05	0.07	Tyumen Industrial University	Tyumenskaya Oblast	6655
0.04	0.07	Samara State Univ. of Economics	Samarskaya Oblast	1826
0.04	0.20	North-Eastern State University	Magadanskaya Oblast	573
0.04	0.10	Siberian State Industrial University	Kemerovskaya Oblast	1727
0.04	0.13	Samara State Technical University	Samarskaya Oblast	2879
0.03	0.09	Siberian State Univ. of Geosystems & Technologies	Novosibirskaya Oblast	1768
0.03	0.10	Kamchatka State Technical University	Kamchatskaya Kray	826
0.02	0.15	Arctic State Inst. of Culture and Arts	Resp. Sakha (Yakutia)	366

universities to the Bologna accord (Avdeev 2020). More recently developed machine learning techniques hold great promise and can be applied to regional returns in the Russian Federation (Kim et al. 2019).

- **Detailed Institutional Returns** In a competitive higher education global environment, countries have set up detailed databases regarding the cost of education, for example `https://www.hesa.ac.uk/data-and-analysis` in the UK and `https://nces.ed.gov/ipeds/` in the USA. The bus.gov.ru database, while not established for that purpose, has provided a useful starting point as demonstrated in this study. A staged research study that collects further information from the institutes themselves would be very useful. Also, with adequate safeguards to protect privacy, household surveys conducted by Rosstat could begin to record the identity of the institution where an individual study. An online platform can be created with a feedback system to ensure data accuracy and transparency.

- **Entrepreneurship and Returns** There is a very interesting variable in the graduate.edu.ru website that was not exploited in the study - this is information about graduates who are registered with the Pension Fund as entrepreneurs, together with information about their earnings. Traditionally, entrepreneurs may not have been well represented in studies of returns to education because of their often sporadic income. However, Russia's future prosperity hinges on the creation of new jobs and through innovation - it would be extremely useful to study how entrepreneurs fare in terms of earnings, and the causal effect of their education.

- **Regional Efficiency** Social returns to education by region have been provided in this study as a first approximation based on data that is available regarding costs for a six year period from 2013 to 2018. The effective subsidization of college and university education can be evaluated very well by examining the divergence between private and social returns. The analysis can also be disaggregated by specialization, spatial categories or by administrative arrangements. With regions seeking to accelerate their development, fiscal efficiency is particularly important and studies building further on the demonstrated example of this study can be deployed for that purpose.

- **Effect of Covid-19** Four kinds of studies regarding the impact of the Covid-19 related shutdowns with the purpose of mitigation and to develop resilience to future pandemics: (a) Impact of lost time in education on learning or cognitive achievement of children and youth; (b) Impact of truncation of schooling year on eventual educational attainment; (c) Positive deviance studies regarding digital or distance education that worked or other factors that provided resilience to learning loss (Pascale and Monique 2010); (d) Simulation studies of potential impacts of learning loss on economic output in the future.

5 | FIVE MAIN RECOMMENDATIONS

Education quality and innovation policy: The Russian Federation needs to make investments in the quality of education and enhance youth entrepreneurship to stem the tide of falling returns to education. It appears very difficult for state owned enterprises or the public sector to generate bigger streams of job openings and also become more efficient. Quality improvements in education, geared to providing students with 'learning to learn skills' as well as practical skills such as financial literacy, with continued improvements in 'Doing Business' indicators will lead to productivity improvement.

Policy needs to work harder for gender parity: Gender segregation of jobs and gender earning gaps remain wide in the Russian Federation, with women earning lower than men at all levels of education. Returns to education have been higher for women which would help to reduce the gap, but recent data indicates that women may have stopped going to university in the numbers they were doing before, which does not bode well for the earnings gap. Policies to retain women's interest in university education and provision of learning opportunities at work will help to resume

the path towards gender parity in earnings.

Lifelong learning for vocational education: Supporting continuous investment in human capital through the career is more important now the base level of education in Russia is amongst the highest in the world; this will reduce depreciation, especially for vocational education. Reduction in the depreciation of human capital will help to improve the returns to education. Depreciation can be reduced not only through learning while on the job, but also by the content and method of schooling so that students become proficient lifelong learners.

Strategy for priority regions: A policy diagnostic based even on rough measures of labor market demand and supply is shown to capture regional diversity. Refinement of the measures for the high priority regions will support the design of customized policy solutions, for example for three pilot regions of Pskov Oblast, Altai Krai, and the Adygea Republic. Human capital formation tends to have long historic roots and path dependence means that regions similar in terms of gross regional product may have vastly different human capital potential and challenges.

Government transparency for citizen benefit:. Revitalize the graduate.edu.ru website which has not been updated since 2016; Deepen the financial information collected from bus.gov.ru and annually update resulting data on institution level education returns to improve student choice and system efficiency. Collecting accurate information on graduate salaries and on college and university costs is itself a costly endeavor, but is amply justified by the gains in efficiency that would result. The transparency and digital government initiatives undertaken by the Government have been progressive, but are not yet instrumental in meeting strategic development goals. To be truly effective, a further set of steps need to be made, to close the feedback loop with citizens making decisions based on the information provided, and those decisions, in turn, influencing institutional and system management.

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