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**«The comparative analysis of the return to education in Post-Soviet countries»**

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**THE COMPARATIVE ANALYSIS OF THE RETURN TO EDUCATION IN POST-SOVIET  
COUNTRIES**

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## **Abstract**

This thesis explores the private returns to education in the former Soviet countries of Central Asia and Azerbaijan with EBRD “Life in Transition - 2016” survey data. The private returns to education is the concept assessing an increase in wages as a result of an increase in the level of education, as introduced by Jacob Mincer. It is important to understand the returns to education for education and labor market actors (students and their parents, universities), policy-makers and employers since they provide informational signals in a market of imperfect competition, asymmetry of information and other market failures.

According to the results of the analysis, Tajikistan and Azerbaijan have the lowest rates of the returns to education, while Uzbekistan has the highest rates. This possibly should be explained by the underdeveloped structure of the economy and labor markets (in the case of Tajikistan), low quality of education (in the case of Azerbaijan) and lack of educated people and high demand for education (in the case of Uzbekistan).

## **1. Introduction**

Nowadays, education became one of the most demanded goods since knowledge and skills of employees become extensively demanded by labor markets. Education determines the quality of human capital and therefore, it has a cumulative effect on the country's GDP and shapes the social and private returns to education.

Since ancient times education has played a vital role in human development. In fact, an educated nation always had a competitive edge over others, which helped them to ensure faster economic growth and have better wellbeing. As the ex-chairman of the Senate of Uzbekistan name? stated, no atomic bomb or war is needed to destroy the nation, instead, all needed is a low quality of education. His claim fully conveys the importance of education for any country's existence and development.

It is generally accepted that education is a sum of acquired knowledge, skills, and competencies. In other words, education is a process or even a product of skills formation that promotes innovative performance. Innovative performance includes research and development activities, invention, information technology development and etc. Breakthroughs in the education system help to attract new talents, increase competencies, develop science, increase productivity and employment rate. All these factors, as an aftermath, should result in the growth of the economy.

Investments in the educational system not only help in a micro-level to reduce the level of poverty in countries, increase the employment rate but also will help on a macro-level for the country to enhance its economic and social positions in the world. Depending on the quality of education, people might be well prepared for the market needs and their fluctuations. Educated employees can ensure more productivity by performing tasks more efficiently. As a result, a country with productive business and industry will have faster and better economic growth ensuring their power in the world economic arena.

An educated human capital is a driving force for economic growth. To meet the labor market needs and changes, people need to invest in themselves by developing their existing skills and learning new ones.

The acquisition of professional skills and sharpening it requires considerable human effort. This is not only limited to the dedication of time and energy but also a monetary investment.

Human capital development is a necessary part of a labor strategy. For example, an employee with a decent education can apply for the positions of managers and senior-level positions, which contributes to an increase in wages. Thus, getting better education might lead to the economic benefit from it.

After the collapse of the Soviet Union, large-scale reforms were introduced into the education systems of the former Soviet countries. These changes had advantages as well as disadvantages, which led to job optimization and an increase in the unemployment rate. Governments are currently regulating this issue and making efforts to improve the education system.

One of the trends in today's world is the digital transformation of business, the use of sophisticated technologies such as electronics and robotics. In this context, the issue of increasing competitiveness in the labour market has become particularly relevant, where education has a significant impact, as only highly educated people successfully master new technologies, skills engineering, and technical jobs and survive in the context of globalization (Gerlind Wisskirchen, 2017).

Tinbergen's research (1974-1975) confirms that the growth of technology requires highly skilled and literate people because only with appropriate education it is possible to master cutting-edge technology.

Rapid transformations and difficulties in all spheres of life require a trained and competent workforce. There is a need for significant investment in intellectual capital for nations willing to increase their capacity to innovate and remain competitive. The allocated investments should be realized through the creation of world-class higher education institutions for the continuous development of education.

## 2. Literature review

Human capital is one of the leading topics in Economics research. The formation and accumulation of human capital have been addressed by W. Bartlett, M. Nordin, I. Pesson, D. Root and many others. G. Becker (1964) and T. Schultz, the founders of the human capital concept, argue that education is the main driver for income growth and economic development. According to Schultz, human capital is the knowledge and skills that is used in production of goods and services. J. Mincer also justified the effectiveness of investing in human capital. The emergence of human capital theory was a response to the need for economic growth. However, Helen Connolly and Peter Gottschalk's analysis suggests the opposite hypothesis about human capital, which explains that less educated people are more likely to be less able and not particularly interested in investing in their capitals because of low income.

One of the most common themes in the Economics is the return to education (Ashenfelter and Krueger 1994; Becker 1964; Becker and Chiswick 1966; Card and Krueger 1992; Card 2001; Duflo 2001; Heckman, Lochner & Todd 2006; Oreopoulos 2006; Rosenzweig 1995; Schultz 1961). The notion of "return on investment from education" was first used by the American economist J. Mincer in 1958 to assess the relationship between education and workers' wages. He proposed the model estimating the returns to education as a function of years of schooling and work experience. By investing in education - i.e. human capital, people have the opportunity to become competitive in the labour market and increase their earnings.

Investment in education and human capital accumulation are key indicators of economic development in the long run. To justify the hypothesis of increasing productivity as a function of education, the researchers formed an approach using the DOLS model, the Cobb-Douglas function, and World Bank data for the period from 1996 to 2014 for 42 countries (H. Mefteh, M. Bouhajib, 2013). GDP per capita, R&D expenditure, patent applications, and tertiary education expenditure were chosen as key indicators. According to the results, a 1% increase in R&D expenditure leads to a 0.854% increase in economic growth, a 1% increase in patent applications leads to a 0.075%, while the increase in public expenditure on education for 1% results in 2.882% increase in economic growth. Based on these results, it can be



concluded that higher education has the greatest positive impact on economic growth (H.Mefteh, M.Bouhajib, 2013).

A 1% investment in education in EU countries results in a 0.35% increase in gross domestic product. Also, an increase in macroeconomic productivity depends on an increase in the level of education. If the level of education increases by 1 year, per capita production output increases by 6% (A. Maddison). The OECD studies also confirm that a 1-year increase in the literacy rate of society would increase the economy by 5%.

Kingdon, Patrinos, Sakellariu, Soderbom, Schultz state that investment into a higher education accounts for a larger proportion of income than other levels of education. However, the returns to education are found to be higher in developing countries than in developed countries, but there is little evidence to support this claim (Card and Duflo, 2001). Psacharopoulos and Patrinos argue that people with a basic primary education generate the bulk of income in developing countries, whereas higher education has a significant advantage in developed countries.

A major contribution to the concept of returns to education was made by Psacharopoulos, who shaped the returns to education into an empirical model (investment in human capital).

For analysis purposes, people can be divided into 4 groups:

1. High education - high income,
2. Higher education - average income,
3. Low education - sufficient income,
4. Low education - low income.

People with a high level of education earn a high income. There are cases where higher education does not guarantee a high salary because it depends on the person, there are several characteristics of abilities and skills like talent, intelligence, savvy.

A person with low educational attainment has the potential to earn high wages at the expense of his or her qualities. However, workers with low qualifications often face what Burdett and Smith (2002) have called the 'low-skilled worker trap': their lower level of numeracy and literacy skills can lead to a less favorable starting position in the labor market, which in turn can lead to unemployment or low-level positions in organizations with low wages and fewer career opportunities (OECD, 2012a; Reder 2012). Their skills, without proper development, remain weak and/or deteriorate over time, making it even more difficult for them to progress further in their career ladder.

According to research by Binner and Parsons (2005, 2006, 2007), adults aged 16 to 34 with poor numeracy skills experienced three times as much unemployment as people with high skills. People with poor numeracy skills were often at risk, in low-paid jobs, and less likely to receive training or promotion. Similarly, in a 2012 online survey about maths and numeracy (i.e. using maths in everyday life), two out of five people had low maths skills as a deterrent to finding and getting a job (National Maths for All, For Life, 2014b, 2014d.). Although the PIAAC results showed that in the world about half of employees with low literacy and numeracy skills are employed, at the same time they are at higher risk of job loss, unemployment, and low wages than employees with higher levels of education (OECD, 2013a; OECD, 2013b).

Research has confirmed that low-skilled workers are least likely to invest in themselves and receive employer support to develop their skills (Desjardins and Rubenson, 2013).

A study was carried out where a Dutch company conducted a questionnaire survey for all employees. The results of the questionnaires revealed that people with low education increased their cash flow after receiving additional education. People with a low level of education were more eager to gain new knowledge to increase their income than those with higher education. There are citizens with higher education who did not receive that new information, due to which there was no significant effect in terms of income from acquired knowledge. One Dutch scientist concluded that employees with higher education receive training only to maintain their existing knowledge and develop their personal growth. Thus, it has

been repeatedly confirmed by empirical research and observation that education has an enormous impact on income.

In terms of gender differences, J. Mincer found that men have a higher income than women because women interrupt their careers due to family circumstances, such as the birth and subsequent care of a child. Men, on the other hand, have an uninterrupted work record, earn the most income, and employers, in turn, do not discriminate against people because of gender differences.

### **3. Country context: overview**

This section presents overview of the economies of the countries under analysis: Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan and Azerbaijan.

The mentality, economic situation, and culture of these countries are broadly similar. According to BRIF Research Group's corporate blog, Central Asia accounts for approximately 0.3% of the world economy. At the same time, the economies are three times lower in terms of GDP (1%) with a share of the world's population.

The economic development of the Central Asian countries is influenced by indicators such as:

- The availability of natural resources such as hydrocarbon reserves,
- The presence of transport and communications network and the fact that they serve as transit countries,
- Cooperation with each other and with neighboring countries.

Natural resources, in particular oil, gas, coal, and metals, are sought-after commodities for export that attract the attention of many states.

According to BRIF Research Group, Central Asian countries have total oil reserves of 15-31 billion barrels (7.2% of the world's oil resources), and natural gas reserves of 230-360 trillion cubic meters (7% of the world's gas resources).

Table 1. The comparative statistics for main economic indicators of Soviet Union countries

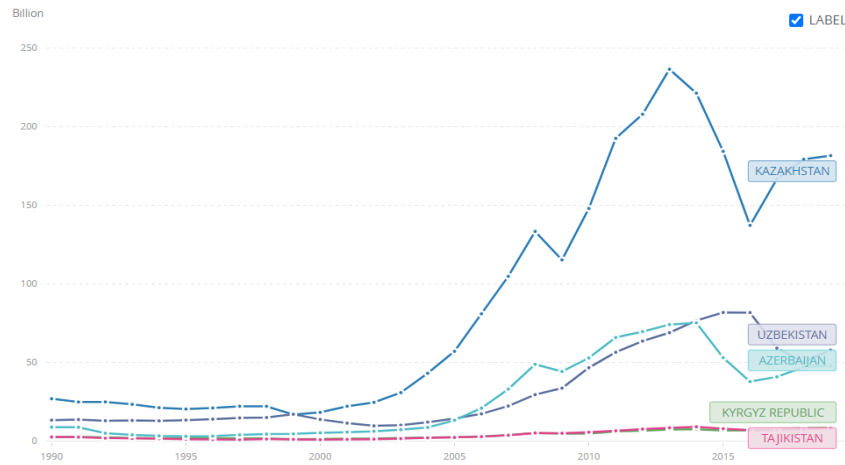
Economic indicators 2016	Kazakhstan	Kyrgyzstan	Uzbekistan	Tajikistan	Azerbaijan
GDP per capita in \$	7 714.8	1 120.7	2 567.8	802.5	3 880.7
population	17 794 055	6 079 500	31 847 900	8 663 579	9 757 812
Unemployment, total (% of total labor force)	4.96	7.21	5.2	6.9	5
Poverty headcount ratio at national poverty lines (% of population)	4.3	25.4	14.1	30.3	6
Life expectancy at birth, total (years)	72	71	71	70	72
Gini index	27.8	29.7	35.3	34	26.6
Source: World Bank data					

### **Kazakhstan**

Natural resources are a sustainable advantage for Kazakhstan's economy. Similar to all Soviet states, Kazakhstan went through an economic crisis in the 1990s, with gradual economic growth beginning in 2000.

New oil fields, construction of pipelines, opening up opportunities for oil exports provide the country with significant oil revenues. Today, Kazakhstan is at the forefront among other Central Asian countries in terms of oil production. The country has enormous oil production potential in the Caspian region of West Kazakhstan, which accounts for about 3% of the world's oil reserves and 1.2% of natural gas. In 2016, Kazakhstan ranked 56th out of 191 countries in terms of GDP. Kazakhstan accounts for more than half of the total GDP compared to the other Central Asian countries, which is shown in the graph below (picture 1).

Picture 1. GDP (current US\$)



Source: World Bank data

Kazakhstan has valuable deposits of mineral and energy resources, 60 of Mendeleev's 110 elements are used for industrial production, and is the world leader in uranium extraction (25%) and the presence of iron ore reserves (8%). In addition, Kazakhstan grows wheat, barley, sunflowers, and other cereal products, 12% of industrial production is in non-ferrous metallurgy, and Italy and Germany are the main importers of Kazakhstani copper.

In Kazakhstan, the minimum wage rose from 14,592 tenge (US\$34.07) (2010) to 42,500 tenge (US\$99.24) (2021), according to statistics. Along with this, the basic pension is increased from 16,037 tenge (US\$37.45) to 36,108 tenge (US\$84.31) that is slightly greater than the official cost of living of 29,698 tenge (US\$69.34).

### **Kyrgyzstan**

Like other Central Asian countries, the country's economic performance was poor in the 1990s. As a result the country experienced declining living standards, quality of life and social services, increase in inequality and poverty. From 1990 to 2001, the country's GDP dropped by a factor of 10.35. It was necessary to close the foreign debt which amounted to 3,031 million dollars. Most of the products were

exported. Some of the debt was closed by income received from tourism which generated \$509 million in revenue.

Kyrgyzstan's economy is comprised mainly of energy, mining, and services. Electricity is the mainstay of the country's economic development. According to the World Energy Council, the utilization rate of technical energy potential is about 14.3%, while in terms of the economic potential it is 25.8%. The country's main mineral resources are mercury, gold, tin, and tungsten. However, raw material reserves have been decreasing over time, as have oil and natural gas reserves. Labor migrants are noteworthy, with remittances accounting for 29% of Kyrgyzstan's GDP. The average monthly wage in 2017 was 15,670 soms (US\$224.82); for 2019, the amount rose to 16,478 soms (US\$235).

## **Uzbekistan**

In the 1990s, Uzbekistan's economic performance was among the lowest in post-Soviet countries. The Uzbek authorities used resource revenues efficiently and channeled them into education and health care. Until 2002, economic reforms were implemented at a slow pace, with increasing political repression.

To boost the country's economy, the course was to explore the region's natural wealth. The economy of an independent Uzbekistan depended on imported grain resources and the maintenance of irrigation systems. The industry represents 33% of GDP, services account for more than 48%, and agriculture for 19%. The gas industry (14th in the world), power generation, cotton processing (3rd in the world for cotton exports), textiles, uranium extraction (4% of world reserves), and gold (4th in the world for reserves) form a large part of the industry.

Oil and gas account for 97% of the country's primary fuel and energy resources, with coal and hydropower accounting for the rest. Ferrous metals, copper, silver, tungsten, and gold make up the country's metallurgy. The country has well-developed automotive, electrical, construction, food processing, and pharmaceutical industries.

In the structure of the country's imports, 42.5% are machinery and equipment, 13% chemical products.

In the CIS, Uzbekistan interacts with Russia, Kazakhstan, Tajikistan, Turkmenistan, Belarus, and Ukraine, which account for 37% of the foreign trade; China, Turkey, Germany, Japan, the USA, Italy, India, and Korea account for 63% of the foreign trade turnover. The average monthly wage is 679,330 sums (US\$ 64.33), and the average pension is 466,680 sums (US\$44.19).

## **Tajikistan**

Tajikistan is considered the poorest country in Central Asia. Economic growth has been observed since 2000 due to the promotion of reforms and the strengthening of internal security. To boost economic performance, the government of the country has created 4 socio-economic zones (SEZs) which have been granted economic privileges. In order to develop the SEZs, all administrative obstacles were removed from the subjects, and they are exempted from paying taxes and customs duties.

At the same time, the government of the country has defined the main strategic goals, such as achieving energy independence, ensuring food security, liberation from transport isolation. Foreign investments are attracted to the country for industrial development. There are about 310 companies with Russian investments in Tajikistan, 40 of them are large companies, aimed at the development of sectors such as communications, energy, financial services, agriculture, light industry, pharmaceuticals, and much more. According to data from 2010, the country's GDP was \$15.6 billion, which is 6% more than it was in 2009. From that 48% was service production, 42% was goods production, and 10% was taxes.

Since ancient times, Tajikistan has been considered an agricultural country. Cattle breeding and fishing play a significant role. Mining, chemical, metallurgical, cotton, and machine-building industries are the key industries of the country. The economy of the country depends on funds earned by immigrant laborers, as well as aluminum and cotton exports. A significant part of income comes from hydropower.

In the period of independence, there was a railroad, the railroad has a significant role in freight transportation.

The number of Tajik people working in Russia is about 1 million. Mainly 90% of resources are transferred from Russia, amounting to about 2.5 billion US dollars. According to the World Bank, Tajikistan ranks 1st place in the world in terms of remittances to the country, which accounts for more than 40% of the country's GDP.

The minimum wage in the country is 400 somoni (\$42.4), and the average wage is 1,144 somoni (\$121) per month.

## **Azerbaijan**

Azerbaijan is an industrial-agrarian republic with developed industry. Azerbaijan attaches particular importance to the oil and gas extraction, refining, chemical, machine-building, and mining industries, as well as to the non-ferrous metallurgy, food, and light industries. Oil and natural gas, copper ore, gold are valuable mineral resources of the countries.

Economic indicators refer to high rates of economic growth in the world. Azerbaijan is adding growth of 13.6% on an annual basis. Azerbaijan attracts foreign investment to develop its economy. The key investors are major oil companies from foreign countries. A significant part of the investment in Azerbaijan's oil company is expected from Japan. The Republic cooperates in foreign trade with such countries as Russia, Japan, Turkey, Kazakhstan, Georgia, Ukraine, Germany, USA, UAE, Iran, Turkmenistan.

Marine and road transports have significant importance. The main Baku-Tbilisi-Ceyhan oil pipeline and the Baku-Tbilisi-Erzurum gas pipeline were launched. According to the result of reforms and economic transformation, the country has been on a successful path to economic growth. More than 700 jobs were created, the poverty rate was reduced from 49% to 13%, and industrial production increased 2.5 times.

According to the data of World Bank, Azerbaijan was identified as the main business reformer in 2008. It was shown how to run a business efficiently, wherein reducing the number of procedures to start a business, paying taxes and other payments online. Being competitive is the main objective of medium and small businesses. The main economic indicators of the country show positive dynamics. The minimum wage in the country is 250 manat (\$148).



#### 4. Education system

The education systems in Central Asia countries and Azerbaijan are similar, as these countries were all united by the Soviet Union prior to independence. The education system consists of the following levels:

The first stage is schooling, which consists of 3 stages,

1. Primary (4 years, years 1-4)
2. Basic (5 years, grades 5-9)
3. Secondary (2 years, school years 10 to 12).

The second level is higher education (baccalaureate), where training lasts 4 or 5 years.

The third level is postgraduate education. The study period consists of 2 years.

The fourth level consists of postgraduate and doctoral degrees.

After the collapse of the Soviet Union, the quality of education deteriorated, due to a lack of funding from the government. Lack of state financial support has resulted in low teachers' salaries, which has led to teacher attrition and shortages. Consequently, in order to develop the countries' economies, a number of reforms has been initiated in all countries and their education systems are being improved to the present day. Nowadays countries are investing in education according to their capabilities as follows (Table 2):

Table 2. Expenditure on education

Expenditure indicators	Kazakhstan	Kyrgyzstan	Uzbekistan	Tajikistan	Azerbaijan
Share of education expenditure in GDP	4,65%	6%	5,3%	5,2%	2,5%
Expenditure on pre-school education	6,8%	10,7%	-	5,3%	7%

Expenditure on general (special) secondary education	4,1%	7,3%	-	2,9%	5,2%
Expenditure on higher education	15,3%	4,6%	-	9,9%	14,6%
Expenditure per student (secondary education)	11,3%	5,6%	-	19,6%	18%
Expenditure per student (tertiary education)	11,3%	5,6%	-	19,6%	18%
Source: OECD data					

Table 2 shows education expenditure of the Central Asian countries and Azerbaijan. The Kyrgyzstan is slightly ahead of its neighbors in terms of share of expenditure as a share of GDP. Azerbaijan, on the other hand, shows the lowest investment in education. Kazakhstan, Tajikistan and Azerbaijan focus on developing higher education, while Kyrgyzstan strengthens pre-school education.

Table 3 shows the number of schools and higher education institutions.

Education institutions	Kazakhstan	Kyrgyzstan	Uzbekistan	Tajikistan	Azerbaijan
Number of schools	7398	2227	9942	3747	4557
Number of universities	125	64	81	38	48
Source: National statistics of 5 countries					

The largest number of higher education institutions is in Kazakhstan and the smallest numbers is in Tajikistan and Azerbaijan.

In 2019, Kazakhstan has the highest higher education enrolment rate with 62% compared to the rest of the countries. Kyrgyzstan comes second (42%), followed by Azerbaijan (32%) and Tajikistan (31%) with similar percentages. Uzbekistan has the lowest level of higher education enrolment (13%).

Table 4. School enrollment, tertiary (% gross)

№	Country	Value
1	Azerbaijan	32%
2	Kazakhstan	62%
3	Kyrgyzstan	42%
4	Tajikistan	31%
5	Uzbekistan	13%
Source: World Bank data		

## 5. Data and methodology

This thesis employs the «Life in Transition - 2016» survey data conducted by the EBRD for comparative analysis on the returns to education in five countries. The survey has been conducted by the EBRD in post-Communist countries for three times (2006, 2010). 2016 is the last wave of the survey. It seeks to research a link between transition and people's daily lives, to understand people's views of the future, and to assist in the transition to an open market economy after the collapse of communism. Based on the results of the study, the feedback from society might be learned which shows the result of the reforms that aim to improve the welfare of the people living in the region.

The survey conducted by the Bank in 2016 is one of the most extensive one with 1,500 people from 95 localities interviewed in each country. The survey includes 29 transition countries which consists of 51,000 respondents.

The questions were composed together with the World Bank and Transparency International. The «Life in Transition 2016 survey» consists of nine-question blocks. The nine blocks include key questions about

the interviewee's identity, housing, financial wealth, occupation, education, and career history. The interviews were conducted in two stages. Data from 2016 showed that people in Central Asia and Central Europe are more satisfied with their lives than they were in 2006 and 2010. It points out that people believe and hope for the best in the future. Second, according to recent results, it was determined that the attained level of education of men and women is identical. However, men's wages are higher than women's for equal work, so there is a gender pay gap. Women are less involved in work compared to men due to social absences from work (child care, family care). There are more women entrepreneurs in Western Europe than in transition countries, although the proportion of women entrepreneurs has not changed from previous data. Women's activities in the political sphere also remain limited.

The survey "Life in Transition - 2016" counted the percentage of respondents satisfied with the quality and efficiency of public services. For primary/secondary education the satisfaction rate in Kazakhstan is 69%, in Uzbekistan - 88%, in Tajikistan - 63%, in Kyrgyzstan - 71%, in Azerbaijan - 66%.

Table 5. The respondents of countries

<b>Country</b>	<b>Number of respondents</b>	<b>Number of observations</b>
Azerbaijan	1510	341
Kazakhstan	3010	1086
Kyrgyzstan	3000	600
Tajikistan	1510	342
Uzbekistan	1506	340
Source: EBRD data		

The study surveyed 57.8% of women and 42.2% of men. The age range was from 18 to 95, and the average age of the respondents was 42. People over the age of 61 were excluded from estimations to focus

on the working age respondents. The number of people surveyed is 341 in Azerbaijan, 1,086 in Kazakhstan, 600 in Kyrgyzstan, 342 in Tajikistan, and 340 in Uzbekistan.

Table 6. Amount of respondents surveyed by education level

Educational level	Number
(Upper) secondary education	4122
Post-secondary non-higher education	2414
Higher education (not a university diploma)	1848
Lower secondary education	1148
Bachelor's degree or more	738
Primary education	143
Source: EBRD data	

The table shows that the majority of surveyed people had secondary education, the percentage of respondents with higher education were low.

Table 7. Gross graduation ratio in tertiary education

Country	Total	Female	Male
Azerbaijan	17.28%	16.73%	17.8%
Kazakhstan	51.59%	59.79%	43.6%
Kyrgyzstan	34.67%	40.19%	29.4%
Uzbekistan	16.4%	12%	20.8%
Tajikistan	-	-	-
Source: UNESCO data			

As it can be seen from the table 7 (data UNESCO), Kazakhstan ranks first (51.59%) among other countries for employed staff with tertiary education and this is confirmed by the OECD data. Azerbaijan and Uzbekistan have similar indicators (on average 17%). Kyrgyzstan performed the average result (34.67%). Due to the lack of available data about the percentage of educated people in Tajikistan it is assumed that this indicator is low. There are 12% more educated women compared to men in Kazakhstan and Kyrgyzstan, but approximately 19% of men have tertiary education in Azerbaijan and Uzbekistan.

Using the EBRD data, this paper estimates the return on education with the Mincer's wage equation:

$$\ln Z = \beta_0 + \rho S + \beta_1 A + \beta_2 A^2 + X + \varepsilon$$

where:

Z - respondent's reported wage

S - respondent's years of schooling (education)

A - respondent's age as a proxy for unobserved years of experience

X - other observed characteristics affecting wages (gender, residence (urban or rural) and sector of employment)

$\varepsilon$  - error term

$\rho$  - the returns to education.

I used two specifications: the basic Mincer's equation with only education and age as explanatory variables and the other one with additional explanatory variables like gender, residence and main sector of employment.

## 6. Results and outcomes

The results of the estimations for the returns to education in Central Asian countries and Azerbaijan are presented below (Table 1, 2).

Table 8. Basic Mincer's specification

		<i>Dependent variable:</i>				
		log(wage)				
		(1)	(2)	(3)	(4)	(5)
schooling		0.028 <sup>*</sup> (0.015)	0.108 <sup>***</sup> (0.018)	0.102 <sup>***</sup> (0.028)	0.057 <sup>***</sup> (0.015)	0.137 <sup>***</sup> (0.021)
age		0.010 (0.018)	0.018 (0.017)	0.025 (0.026)	-0.015 (0.019)	0.047 (0.030)
I(age2)		-0.0001 (0.0002)	-0.0002 (0.0002)	-0.0004 (0.0003)	0.0002 (0.0003)	-0.001 (0.0004)
Constant		5.234 <sup>***</sup> (0.400)	9.414 <sup>***</sup> (0.387)	7.646 <sup>***</sup> (0.534)	6.228 <sup>***</sup> (0.394)	10.777 <sup>***</sup> (0.630)
Observations		341	1,086	600	342	340
R <sup>2</sup>		0.012	0.033	0.030	0.045	0.117
Adjusted R <sup>2</sup>		0.003	0.030	0.025	0.037	0.109
Residual Error	Std. 0.440 (df = 337)		0.844 (df = 1082)	0.952 (df = 596)	0.592 (df = 338)	0.710 (df = 336)

F Statistic	1.369 (df = 3; 337)	12.183*** (df = 3; 1082)	6.044*** (df = 3; 596)	5.353*** (df = 3; 338)	14.822*** (df = 3; 336)
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\* \*\* \*\*\* p<0.01;

*Note:* Azerbaijan (1), Kazakhstan (2), Kyrgyz Republic (3), Tajikistan (4),  
Uzbekistan (5).

As can be seen from the Table 1 returns to education in Central Asian countries and Azerbaijan ranges from 2.8 percent to 13.7 percent. The minimum returns to education is observed in Azerbaijan - 2.8 percent according to the basic equation, and the maximum - in Uzbekistan - 13.7 percent.

In Azerbaijan show that only 20 percent of the population enrolls into higher education institutions. In fact, 10 percent of the population has only primary education, and 69 percent of the population of Azerbaijan has secondary education. It is also confirmed in the EBRD study that only 10% of women and 15% of men have higher education. Normally, this should lead to a higher returns to education since people with higher level of education are a relatively scarce resource. Therefore, the result of estimations for Azerbaijan looks surprising and can possibly be explained by a low quality of education.

Annually Uzbekistan invests 5.3% of GDP in education, along with that the country has less educated population among analyzed countries due to smaller number of universities. Therefore, lack of skills in the young generation and insufficient amount of jobs on the labor market directly impacts unemployment and emigration rate (UNICEF, 2018). This possibly explains the highest rate of the returns to education in Uzbekistan according to the estimations.

In Tajikistan, services in foreign countries account for the bulk of the income. The structure of the economy is least developed and this possibly explains the low rate of the returns to education found by the study - 5.7%.



Return to education in Kazakhstan and Kyrgyzstan are very similar and comprise 10,8% and 10,2% respectively.

Table 9. Specification with additional explanatory variables

*Dependent variable:*

	log(wage)				
	(1)	(2)	(3)	(4)	(5)
schooling	0.047*** (0.013)	0.091*** (0.018)	0.081*** (0.027)	0.047*** (0.015)	0.134*** (0.022)
age	0.006 (0.015)	0.036** (0.017)	0.036 (0.025)	-0.019 (0.018)	0.042 (0.030)
I(age2)	0.00005 (0.0002)	-0.0004** (0.0002)	-0.001* (0.0003)	0.0002 (0.0002)	-0.001 (0.0004)
Gender Male	0.661*** (0.060)	0.244*** (0.054)	-0.021 (0.075)	0.066 (0.061)	0.259*** (0.087)
Residence Urban	-0.010 (0.047)	0.208*** (0.052)	0.494*** (0.077)	0.279*** (0.070)	0.055 (0.080)

Sector Construction	0.147**	0.248	-0.072	0.761***	0.035
	(0.068)	(0.181)	(0.206)	(0.120)	(0.173)
Sector Finance, Insurance, and Real Estate	0.287**	0.674***	0.185	0.932***	0.580*
	(0.127)	(0.230)	(0.241)	(0.281)	(0.316)
Sector Manufacturing	0.136*	0.278	-0.348	0.861***	0.351*
	(0.070)	(0.184)	(0.237)	(0.164)	(0.180)
Sector Mining	0.229	-0.130	0.352	0.575	0.358
	(0.187)	(0.233)	(0.263)	(0.540)	(0.366)
Sector Nonclassifiable Establishments	0.236**	0.163	-0.685***	0.494***	0.234
	(0.113)	(0.174)	(0.216)	(0.189)	(0.219)
Sector Public Administration	0.206***	0.330**	-0.222	0.470***	0.372**
	(0.077)	(0.165)	(0.170)	(0.099)	(0.147)
Sector Retail Trade	0.020	-0.106	-0.968***	0.954***	0.198
	(0.111)	(0.178)	(0.216)	(0.207)	(0.252)

Sector Services	0.129 (0.080)	0.037 (0.163)	-0.228 (0.173)	0.315** (0.128)	0.170 (0.145)
Sector Transportation and Public Utilities	0.150 (0.107)	0.383** (0.180)	-0.346* (0.208)	0.664*** (0.167)	0.502*** (0.192)
Sector Wholesale Trade	0.010 (0.121)	0.335 (0.208)	-0.886*** (0.262)	0.305 (0.386)	1.507*** (0.370)
Constant	4.328*** (0.342)	8.851*** (0.399)	7.744*** (0.530)	5.857*** (0.366)	10.445*** (0.642)
Observations	341	1,086	600	342	340
R <sup>2</sup>	0.361	0.119	0.174	0.257	0.209
Adjusted R <sup>2</sup>	0.331	0.107	0.153	0.223	0.172
Residual Std. Error	0.361 (df = 325)	0.810 (df = 1070)	0.888 (df = 584)	0.532 (df = 326)	0.684 (df = 324)
F Statistic	12.236*** (df = 15; 325)	9.624*** (df = 1070)	8.205*** (df = 15; 584)	7.525*** (df = 15; 326)	5.696*** (df = 15; 324)
<i>Note:</i>	* p < 0.05; ** p < 0.01; *** p < 0.001				

Azerbaijan (1), Kazakhstan (2), Kyrgyz Republic (3), Tajikistan (4),  
Uzbekistan (5).

Table 9 shows the results of the analysis with additional variables, whose outputs are discussed below for each country.

Among the indicators of the returns to education, Uzbekistan occupies the first place with a contribution of 13.4%. The coefficient almost does not change with introducing additional explanatory variables.

It might also be noted that the government strictly controls primary educational institutions (schools), where secondary education is compulsory. In this regard, the level of school attendance is high enough (Ochilov A., 2012).

Kazakhstan and Kyrgyzstan have 9,1% and 8,1% respectively, for both countries the coefficients dropped by around 1% with adding other variables. In both countries the educational system is identical. After the collapse of the Soviet Union, the level of education in these countries had decreased significantly, but nowadays the situation has changed in a positive direction through investments and reforms in the educational system. However, there are shortcomings as in all other countries such as inefficient distribution of resources, unequal access to education, etc. Also, ineffective distribution of resources in the education system leads to overcrowding of students in urban schools. There is a sufficient number of higher education institutions, which is considered as a positive aspect for both countries (OECD, 2013).

Tajikistan has shown the lowest rates in Central Asia. Tajikistan is an industrial-agrarian country, that does not particularly require highly qualified specialists. The majority of the population is people with secondary education. The low rate of return to education in the country is explained by the rapid growth of the population, which induces problems with providing education and job places. As a result, people in Tajikistan are forced to search for a job in other countries to feed their families (UNICEF, 2002). In addition, not all citizens in the country have the opportunity to get higher education. For example, women

have limited access to education due to marriage, also some part of the population has financial difficulties due to informal tuition fees. All of these factors are barriers to skill development (World Bank, 2015).

Azerbaijan similar to Tajikistan has low rates of returns to education. There are few Higher Education Institutions, hence the enrollment rate at universities is also low (Moreno and Patrinos, 2020). The returns to education refer to the share of higher education. It is important to point out that the country allocates 2.5% share of the allocation for education from GDP which is the lowest value in comparison with the post-Soviet countries.

Kyrgyzstan and Tajikistan do not demonstrate statistically significant gender pay gap, while it is the highest in Azerbaijan (men earn around 66% higher wages than women) and relatively high and almost identical in Kazakhstan and Uzbekistan (men earn about 25% higher wages than women).

Kazakhstan and Tajikistan have almost identical returns to education, people in the city earn on average 24% more than those who live in the countryside. Tajikistan has the highest indicator comparatively 50% more rural earnings. The main sectors in Azerbaijan are Finance, Insurance, and Real Estate, Mining, Public Administration (above 20%). In Kazakhstan, significant earnings come from Finance (67%), Transportation and Public Utilities (38%), and Wholesale Trade (33.5%). In Kyrgyzstan, most of the indicators are negative, but there is a positive rate of 35.2% and about 20%.

In addition, one of the relevant issues of the education system of Central Asian countries is the discrepancy between skill and needs in the labor market. There are different hypotheses regarding this problem where there is a lack of skills for work in agriculture, construction, manufacturing. At the same time, it is difficult for employers to find qualified engineers and workers in different industry sectors. In the case of our country, the discrepancy is expressed by the oversaturation of the labor market with highly educated employees and declining quality of education. Conditions of employment in educational institutions are unsatisfactory, the material and the technical base do not meet the established requirements, curricula predominantly focused on memorization rather than skills' development, there is a poor link of education institutions with employers. These are probably the reason for the constant growth

in the number of people acquiring higher education with diplomas serving as only a "pass for employment". A similar situation is observed with the employment of the youth generation that has difficulties with getting employed, while the labor market is looking for appropriate candidates. In this regard, due to the lack of professional demand and the prospects for personal fulfillment, young people might have ideas about employment in foreign countries. According to the employers' opinion, the availability of a sufficient number of qualified specialists and workers at the request of business will reduce the unemployment rate and increase labor productivity in the country (UN, 2013).

## **7. Conclusion**

This paper contributes to existing knowledge by presenting a comparative analysis of the rates of the private return to education in Central Asian countries and Azerbaijan. The average rate of the return to education across the countries is internationally comparable and comprises 8%. of the variation in the return to education depends on gender, place of residence and possibly the quality of education obtained. Moreover, for each country, an overview of the differences in the returns to education is given. While Uzbekistan emphasizes basic knowledge and secondary education and invests heavily in education, women in Tajikistan are not particularly interested in improving education, where socially they also have internal constraints. Kazakhstan, on the other hand, has the advantage of a large number of higher education institutions, whereas in Azerbaijan there is a limited number of them.

In general, the education system in each of the Central Asian countries is developing at its own pace, despite its common origin. The tasks of educational reforms are particularly important since high-quality education affects the formation of the country's GDP in terms of the income it generates. Investments in education will ensure a successful adaptation in a fast-moving world, social mobility, and high competitiveness. Therefore, one of the most important life strategies for a person is to receive a high-quality education. It is also beneficial for a society as a whole through the public returns to education. However, if the economic development of a country lags behind the quantity of education supplied, the growth in the number of educated people might create another problem – over-education. Low quality of education can additionally contribute to it. In this regard, to resolve this issue, one of the

recommendations is to identify the discrepancy between the labor market and the market of educational services, and then "build a bridge" between education institutions and the industry.

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