Higher education as a factor in increasing economic growth in Uzbekistan

[1]Ochilov Akram Odilovich,

[1]Karshi State University, Associate Professor, Doctor of Economical sciences (DSc)

[2]Ganieva Sharifa., [3]Babaeva Lola., [4]Abdullaeva Komila, [5]Muhammadieva Zarifa,.

[2,3,4,5]Karshi State University, Uzbekistan

ABSTRACT

Recently, Uzbekistan has paid much attention to higher education as a factor in increasing economic growth. The mission of the research was to determine what, along with human resources and capital, higher education, whether it can have an impact on the economic growth of the country. In this regard, this article examines the problems and achievements of educational and innovation systems, as well as their role in stimulating economic growth. The analysis of the results of scientific research showed the relationship between the number of highly qualified personnel with higher education and economic growth. Regression assessment with GDP growth as a dependent variable and number of graduates, expenditures per graduate and accumulated average school year as independent variables revealed the relationship between higher education and economic growth in Uzbekistan.

Introduction

Analysis of statistical materials on the level of world literacy shows that this indicator, in particular, in Norway 100%, in Russia 99.7%, in Japan 99, 0%, Singapore 98.1%, India 71.2%, Pakistan 57.9%, and Uzbekistan 96.9% (https://ru.wikipedia.org, 2020).

This means that Uzbekistan is among the leading countries in terms of literacy. This indicates that school attendance is very high, which is not surprising when you consider that secondary education is compulsory in Uzbekistan and schools are under state control. Speaking about the model of reforming the education system in Uzbekistan and the experience of its implementation, it is important to note that about 35% of the population of Uzbekistan are children under 16 and 60% are young people under 30. In world education, Uzbekistan has a relatively high education index and is proportionally higher than the life expectancy and GDP indices, on average 0.77. This shows the importance of education, especially higher education, in Uzbekistan. At the initiative of the President of the Republic of Uzbekistan, the country has begun to form in Uzbekistan the foundation of a new Renaissance

era in Uzbekistan - the Third Renaissance. Mirziyoyev (2020) emphasized about this, "Since ancient times, the issue of upbringing and education has always had an urgent meaning. How do the developed countries of the world achieve high progress and prosperity? Isn't it because of the tremendous focus on science and education? That is why in recent years, in order to comprehensively develop the country, build a new Uzbekistan, radical reforms, as in all other areas, are being carried out in the education system. New horizons in the development of the sphere, undoubtedly, are opened by the recently adopted "Law On Education". In this regard, the purpose of the study is to analyze and criterial assessment of the quality training of specialists with higher education in Uzbekistan and to determine the relationship between the number of highly qualified personnel with the indicator of economic growth.

Literature review

It is obvious that, cognitive skills have a substantial effect on economic growth of any country. Many economists have been interested in learning not only the effect of quantity of education but also the effect of quality of

education on economic growth since 1970s. Barro (1999) examined the schooling quality and economic growth while Hanushek and Kimko (2000), Hanushek and Woessmann (2007) had studied the relationship between quality of education and economic growth. Hanushek, Kim and Woessmann have measured the quality of education based on cognitive skills in mathematics and science whereas Barro (1999) uses data on internationally test scores to measure the schooling quality and these researchers have found that, qualitative education has a strong and robust influence on economic growth. In this empirical research, the main issue will be to discuss the direct correlation between quantity of higher education and economic growth in Uzbekistan and to find out whether skilled labor is more important than the quantity of educated workforce in Uzbekistan.

The researchers, Eduardo and Marcio Laurini (2010) from Insper Institute of Education and Research and Ibmec Business School, have presented new evidence on the role of cognitive skills in Economic Development. An article by Dr. Robert B. Kozma, (2008) provides good understanding of knowledge economy and its contribution to economic growth.

The results of the study by A. Maddison (1991) showed a direct relationship between the rate of economic growth and the level of education of the population: an increase in budgetary spending on education by 1% leads to an increase in the country's GDP by 0.35%. V. Shchetinin (2001) explains that the economy can develop only in conditions of an increase in the level of education of the workers involved in it, who make a significant contribution to social production. Pogadaeva S.S., Kharitonova N.I. (2002), Shakkum M.L. (2002) write that in world practice, special attention is paid to the problem of the impact of education on economic growth, since from 70 to 90% of GDP is determined by scientific technical progress and innovative economy. Thus, according to experts, in countries

with the most developed economies, on average, 60% of the increase in national income is determined by the increase in knowledge and education of society. Similar studies were carried out by the Organization for Social and Economic Development (OECD) (Lukichev G., 2003), which showed that increasing the "education" of society for 1 academic year provides an increase in the economy of the OECD countries by 5% in the short term and by 2.5 % - in the long term.

The influence of education on economic growth was also studied in the EU countries, the results showed (Sianesi B., Van Reenen J., 2014) that an increase in the level of education increases macroeconomic productivity, in particular: an increase in secondary education by 1 year raises production per capita by 6%; an annual increase in human capital by 1% in higher education provides an increase in the growth rate of GDP per capita by 5.9%.

Ochilov A. (2012) argues that for Uzbekistan, investment in to the quality of education can be very useful rather than investing in to the quantitative education. For education quality we have chosen the average final exam scores of students (the first attempt), while number of graduates were chosen as the best representative of education quantity (Ochilov A., 2014). Ochilov A. Ruziyev Z., Babayeva L., Ganiyeva Sh. (2020) determined that the above results suggest that one-unit change in number of educated workforces causes nearly 2 percent increases in economic growth of Uzbekistan. One-unit change in capital investments causes 0.02 percent increase in economic growth.

Analysis of publications on this issue by many authors: Atakhanov R.A. (2018) Trokhimchuk A.V. (2017) Bouhajeb M., Mefteh H., Ben Ammar R. (2018), Lafuente-Ruiz-de-Sabando A., Forcada J., Zorrilla P. (2019). Ahmadi, N., Black, JL, Velazquez, E., Chapman, GE, Veenstra, G. (2014) Rotim, M. (2013) Li, Chepel S.V. (2017) Shodiev T.Sh., Ochilov A. (2014), Ivanter V. V. (2018) showed that there is a

close relationship between higher education and economic growth.

Methodology

Using annual data of the Republic of Uzbekistan from 1997 to 2017, descriptive analysis and statistical tests are undertaken in additional to empirical estimations. In accordance with the Constitution of the Republic of Uzbekistan, all citizens of the country are entitled to receive education. The state guarantees everyone a free general education and school education is under the supervision of the state. Empirical analysis showed that Uzbekistan has not been able to utilize its full potential leaving significant gap to be filled with recommended policy and institutional reforms. Nowadays compilation of technological development, innovations and knowledge is a credible factor of production. Thus, investments into R&D, deepening knowledge, enhancing innovations would create path for unlimited growth for Uzbekistan's economy. First, it is clear that GDP growth rate or GDP per capita growth is the best to represent economic growth. In constructing econometric models however, we selected carefully explanatory variables. During the research, we discussed and compared many versions of best representative variables of the economic growth, quantity and quality of education. One of the theories was to explain economic growth due to education quality via government investment in education sector. However, investment in education has no direct effect on education quality – it may enhance teaching tools and facilities, motivate teachers and have many other effects.

The data in the study obtained from the following sources:

✧ GDP per capita (Y/N): World Development Indicators and Human Development Reports
✧ Schooling enrolment ratio, government expenditure on education: World Bank indicators
✧ Student/teacher ratios: UNESCO and World Bank education statistics
✧ Other information: Finance Ministry, Higher and Secondary Special Education Ministry, State Statistical Committee, and Labor and Social Protection Ministry of the Republic of Uzbekistan

Overview of the higher education system and the labor market

Today, there are 122 higher educational institutions in Uzbekistan, of which 99 are local, 23 are foreign higher educational institutions and their branches. In particular, over the past 3 years, 6 new higher educational institutions, 17 branches and 14 branches of foreign higher educational institutions have been created. Based on the proposals of staff customers, the classification of directions and specialties of higher education includes 329 areas of education and 582 specialties of the magistracy. In the 2019/2020 academic year, part-time education was introduced in 59 higher educational institutions, and regime of evening-study – in 10 higher educational institutions. The number of students studying in higher educational institutions of the country amounted to 410 thousand in the bachelor's degree and 13 thousand in the magistracy, which has increased 1.7 times over the past 3 years. 54.8% of students study the humanities and pedagogical sciences, 25.2% - production and technology, 5.2% - social sphere, economics and law, 5.9% - agriculture and water management, 4.4% - health and social sphere, 4,5% are trained in specialties in the field of service education. 40.8% of undergraduates study the humanities and pedagogical sciences, 23.3% - production and technology, 13.3% - social sphere, economics and law, 5.9% - agriculture and water management, 13.5% - health and social sphere, 3.2% study in the sphere of service education. The admission parameters for the 2019/2020 academic year were 121,000 people and increased by 18% compared to the previous year and by 92% compared to 2016. Since the 2018/2019 academic year, 16 universities of the country have launched joint training programs with foreign universities based on joint educational programs (Concept, 2019, Uzbekistan).

Nowadays in the national economy is going on the deep economic reforms and modernization process that requires an implementation of new of technologies for that there is need to increase the number of qualified workers. According to the State Statistical Committee data the labor force of Uzbekistan in 2019 was accounted for 16868, thousand workers of which 4385,7 were university graduates (26%) and 12482,3 thousand (74%) lyceum or college graduates. The number of HEI graduates and secondary special education establishments has tendency to increase over time. It is worthy to mention that thanks to implementation of the State Program on Employment each year more than 900 thousand new work places are opened in the national economy. The Uzbek universities sign log-term triangle contracts (enterprise-university-graduate) with the enterprises to employ the new graduates. For instance, in 2000 workers with higher education diploma was accounted for 20% against 25% in 2019. But the current market need for specialists in the structural terms is not match with the market supply (UNDP 2020). Despite measures taken to address organizational, financial and educational aspects, higher education in Uzbekistan currently fails to ensure training of skilled human resources that meet the new requirements of the labor market (UNDP 2020). University graduates often lack the skills for successfully developing business and knowledge of the market economy. The demand of the business sector for human resources training is more dynamic than the ability of state educational facilities to meet them. Under these conditions, it is difficult to balance the labor market demand and supply. Consequently, social spheres: healthcare, education remain understaffed even though a sufficient number of specialists are trained. There is still a lack of engineering, mining, ICT specialists for industrial enterprises and of skilled and experienced managers for small business. With regard to labor market demand, personnel training is still problematic in other spheres. It is worthy to point out the extension of education quality effect on GDP growth of

Uzbekistan. Estimation results above showed that the average years of schooling taken as proxy variable of education quality had affected on changes in economic prosperity of Uzbekistan.

Regression Models Identification

We begin our quantitative analysis of the relationship between economic growth and the higher education. The dependent variable is the GDP per capita growth, in $1000. The regresses are the share of university graduate workers in the labor force of the economy (SHQW, in percentage), the investment in education sector, (CI in bin$). For the model specifications, we introduce the following notations of dependent and explanatory variables: GDP per capita, in $1000; Economic growth rate, EG, percentage; Capital Investment, CI, in billion US dollars; Capital Investment growth rate, CI, percentage; Share of the high qualified workers in the labor force, (HEI graduates), SHQW, in percentage; Total number of labor force, engaged in production, LF, in 1000 workers; Number of annual HEI graduates, DNG, in persons; Annual Growth rate of DNG, percentage.

Aggregated investments into the sectors for 1997-2017 grew by 15,9% and exceeded 24% of national income, on average, during the second and third phases of development. The efficiency of the economy (total factors productivity) grew by 4%, average, during the high growth phase. Respectively, real income of the nation grew by average 6.5% from 2006 to 2018. During 1997-2017 period numbers of qualified workers and HEI graduates grew faster than total labor force, which were accounted for respectively 3.5% and 2.2%. The average years of schooling has increased slowly, at rate of 0.8%. From 2006 to 2013, stable and moderate GDP growth rates of the country had relatively more triggered by the growth rates of labor and capital rather than that of productivity. Specifically, increasing number of highly educated and skilled labor force combined with appropriate labor market policies has contributed to the aggregate output growth during the second phase. Thanks to the improving business spheres, encouraged SMEs,

comprehensive trade policies as well as increasing spending on R&D, education and social-welfare, productivity and its contribution to the country's economic growth increased significantly. According to our estimations for 2007-2017 years around 71% of the GDP, growth rates were attributable to the growth of efficiency in the economy.

Preliminary analysis concluded that productivity growth has constituted significant portion of economic growth of the country. With increasing labor factor, theory predicts that increase in the savings rate, or equally investments, leads to permanent increase in growth rates as growth in capital accumulation followed by permanent faster growth of labor never leads to diminishing returns to capital. Permanent increase in labor is obvious by the fact that there is always unemployment in any market economy.

In order to model a time series data with the Box-Jenkins approach the series has to be jointly stationary. In practical terms, the series is stationary it tends to wonder more or less uniformly about some fixed level (Stock J.H and Watson M.W., ****Year). In statistical terms, a stationary process assumed in particular state of statistical equilibrium, i.e. p(x) is the same for all t. Because for our research the time series data is using, we conducted the Dickey-Fuller test. We built a regression lines between fractions of the current values of variables (GDP, SHQW, CI) dependent on a fraction of previous values of the series. In all cases, p-values of variables were less than 0.05 or 5%, so we rejected the null hypothesis and proceeded with econometric analysis. Our time series data is jointly stationary and we can conduct regression analysis based on OLS estimations. Our task is not to develop a forecasting model but rather to estimate causal relationships among time series variables, that is, to estimate the dynamic causal effect on Y over time of change in controlled variables.

All coefficients of the models are statistically significant. For the further analysis,

we have selected the best-fitted specifications: the LIN-LIN and LOG-LOG models. The results in the linear specification suggest that one-unit change in a number of graduate's and capital investments causes respectively around 31 dollar and 95-dollar increase of per capita output. In the LOG-LOG model, one percent change of the number of graduates, other factors held constant, increases the economic growth by 0.57 percent and one percent change of the investment - by 0.11 percent. We assume that the unemployment rate in a country is constant and annual graduates of universities join the workforce without time lags, because all graduates in three months find the job places. The migration of the workforce we do not consider because mainly unskilled workers migrate outside of the country.

Conclusion

Assessment of data and comparison of variables pointed out that education quantity is an important determinant of economic growth. Interesting finding was that quantity and quality of education positively related to the economic growth, what indicates the importance of considering the quality of education rather than its quantity.

In the wide scope, research revealed direct relationship between economic growth and higher education quality and quantity. Although the correlation is weak, number and level of educated workforce have significant influence on economic growth. Especially, education quality is a very critical factor of steady economic expansion in very long run. The hypothesis of direct relationship between education quantity and economic growth confirmed from the estimation results. The relationship is positive but not very strong. This suggests that targeting to increase the number of educated workforces may be inefficient way of supporting economic growth or even cause fall in actual output.

Since the model is very generic, more research is necessary — specially to find specific solutions for different proxy variables of quality. Additionally, research will be initiated to

analyze the differences and adaptation requirements for different proxy education quality to include lagged explanatory variables.

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