ECONOMIC ANNALS-XXI
ISSN 1728-6239 (Online)
ISSN 1728-6220 (Print)
https://doi.org/10.21003/ea
http://ea21journal.world

Volume 212 Issue (11-12)'2024

Citation information: Zokirov, K., Yusupov, A., Sherov, A., Abdullayev, D., Daminova, M., & Umarova, Z. (2024). The effect of foreign direct investment and human resources on economic progress of the agricultural sector in the selected developing countries of Asia (with the focus on Uzbekistan). Economic Annals-XXI, 212(11-12), 10-15. doi: https://doi.org/10.21003/ea.V212-02

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The effect of foreign direct investment and human resources on economic progress of the agricultural sector in the selected developing countries of Asia (with the focus on Uzbekistan)

Abstract. Investment is one of the fundamental and inseparable sectors of the economy, which, together with human capital, can play an influential role in the development and prosperity of the industry. Foreign direct investment (FDI) needs a long-term link and indicates the sustainable interests and management of economical organization residing in the other countries. This study examines the effect of FDI on economic growth in the agricultural section of Uzbekistan during the years 2022-2023. The findings of the research show that FDI has had a positive and significant effect on economic growth through an increase in physical capital and technology. The interaction impact of FDI and human capital on the economic performance of Uzbekistan is positive and statistically significant. Hence, considering the high level of human capital in Uzbekistan, the possibility of technology transfer through foreign investment provides the basis for development and increased productivity, as well as benefiting from technology spillovers, which is also a driving factor in the economic growth of Uzbekistan.

Keywords: Human Capital; Foreign Direct Investment; FDI; Economic Growth; Agricultural Industry; Developing Countries; Uzbekistan
JEL Classifications: E24; E41; E64; I18; J28; J31
Acknowledgements and Funding: The authors received no direct funding for this research.
Contribution: The authors contributed equally to this work.
Data Availability Statement: The dataset is available from the authors upon request.
DOI: https://doi.org/10.21003/ea.V212-02

1. Introduction

Undoubtedly, the prerequisite for economic development and the first condition for entering the field of any economic activity is the possession of capital and is considered as the engine of economic growth and development. Investment is one of the fundamental and inseparable parts of the economy that appears in two forms: domestic and foreign. Currently, FDI (Alrashedi et al., 2024) has become one of the major elements in linking the domestic economy of countries, especially developing societies, with the global economy. FDI has also played a significant role as a factor in transferring capital, technology, expertise and management in order to strengthen the presence of these countries in the global economy and trade. This fact has led to the intensification of economic competition to take advantage of the opportunities available in attracting foreign investment in order to improve the position of countries in the global economy (Bashir & Susetyo, 2018).

One of the most important goals of any economic system is to achieve economic growth and development. Given that the agricultural sector is one of the most important economic sectors, the growth and development of this sector has always been the concern of policymakers and decision-makers in every country. The lack of capital in the agricultural sector of developing countries has led to a decrease in the level of productivity of production inputs. Figure 1 shows the level of foreign investment in Uzbekistan and the share of the agro-industrial sector over the past eight years. Low productivity has reduced the expected income of agricultural projects and the profitability of these activities, making them uneconomical and risky for investors. The main problem of less developed and underdeveloped countries is the lack of resources for investment in creating jobs, economic infrastructure, and improving sustainable development and economic growth. This problem is caused by the lack of foreign exchange earnings from exports and unfair exchange rates that often fluctuate to the detriment of exporters of goods and raw materials (Epaphra & Mwakalasya, 2017). As the average statistics of the United Nations Human Development Report (2021) for the years 2010-2020 for developing Asian countries show that this index is between 0.5 and 0.760, and therefore, these countries have medium or low development (Anwar & Nguyen, 2013). Therefore, it is necessary to strengthen and empower the agricultural sector to achieve development goals by making sufficient and appropriate investments in this sector of the economy (Furaijl et al., 2024).

There are several definitions of FDI. The International Monetary Fund (Fund, 2016) defines FDI as follows: «FDI is a type of investment that is made with the aim of obtaining lasting benefits in a

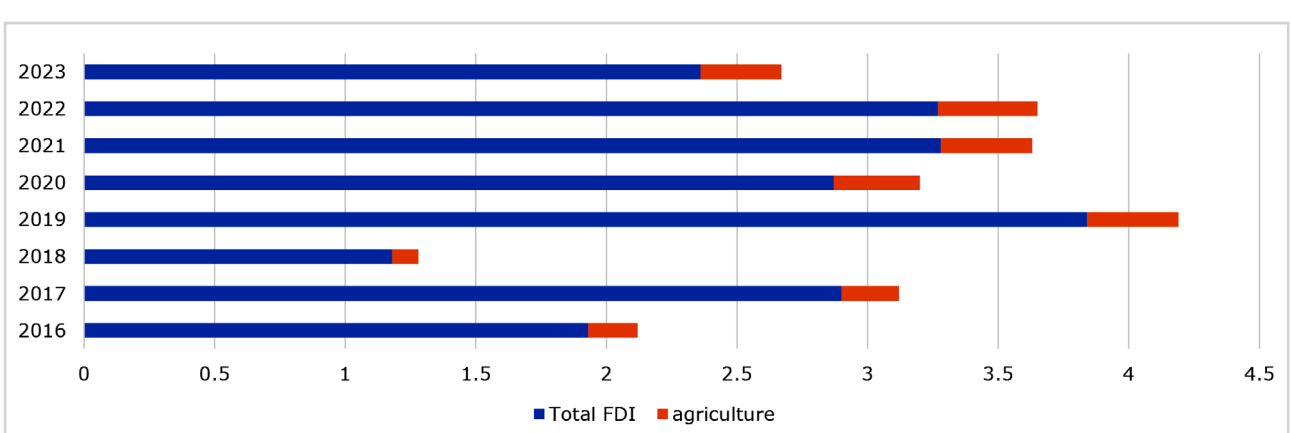

Figure 1:
FDI in Uzbekistan and share of agriculture section
Source: Authors' development based on World Bank, 2022

country other than the investor's home country, and the investor's goal is to have an effective role in the management of the relevant enterprise» (Abbas et al., 2022). According to Series UNCTAD (1999), the distinction between FDI and other types of foreign investment is the need for main influence of the foreign investor in the control of the enterprise. In FDI, the funder seeks benefits by taking role in the decision-making procedure of the enterprise that are not actually possible to get in foreign portfolio investment.

On the other hand, human capital (Sikandar et al., 2021) and improving the quality of the workforce have been addressed as one of the main and fundamental areas and ways to increase productivity and accelerate economic growth. In economic studies, it can be said that human capital is a completely economic concept. In fact, the qualitative characteristics of a person are a type of capital, because this characteristic can lead to greater productivity and production and create more income and welfare. Now, the more extensive facilities a country has to reduce production costs and has a higher level of technology, the greater the flow of FDI to that country will be. One of the factors affecting the attraction of FDI is skilled labor and the development of human resources, and as the process of producing goods and services in the world becomes more complex, the presence of unskilled labor is no longer considered an advantage, so countries that have a trained workforce are more successful in attracting capital and investment.

Human capital is actually a complement to physical capital and allows physical capital to be utilized more appropriately. The experience of advanced countries and various studies on the economic growth of countries over time or among countries have shown that explaining the economic growth rate of countries only through conventional factors, such as capital and labor, does not yield accurate results, and human capital should be included as a main variable in growth models. Economic growth does not depend only on the size and amount of human resources; it also depends on its efficiency. If the labor force is more educated, the mobility of the labor force and the employment rate will be higher. The more the labor force benefits from education and the more useful this education is, the greater the impact of improving the quality of the labor force on increasing production (Sikandar et al., 2021).

Therefore, in the present study, the role of two important variables of FDI as a source for the entry of physical capital into countries, which is considered as one of the production inputs in the economy and has great importance in increasing investment in developing countries and achieving higher economic growth and welfare in these countries, and also human capital as a variable that plays an important role in the economic growth of countries in accordance with endogenous growth models, will be examined. What is considered in this study is not the separate effect of each of the two variables above, and the main goal of examining the role of human capital of the host country on the effect of FDI on economic growth, which indicates whether or not the host country enjoys knowledge spillovers resulting from FDI.

Paul et al. (2021) studied the impacts of FDI on economic growth in ASEAN countries and concluded that not only can FDI stimulate economic growth in these countries, but the impact of this variable is much more effective than the impact of human capital and technological factors. Cicconi and Papiano (2006), examined whether high levels of human capital adapt faster to economic growth by facilitating technology. If so, countries with more human capital should adapt faster to technologies that add skills to the workforce. International theories point to human capital accumulation as one of the important factors of growth in capital-intensive industries, and they also found significant positive effects of human capital levels and the volume of human capital on production and employment growth for Italian capital-intensive industries. They tested the effect of human capital levels on growth in industries that are sensitive to human capital and found that production growth in industries that are highly sensitive to the training of their employees is statistically much higher than in industries that do not care, or at least care less, about the levels and quality of training of their employees.

Roy and Mandal (2012) examined the role of further education. Their study assessed the relationship of human capital and local economic development employing carious indicators of human capital. In their study, various parameters of human capital obtained from census data were used. They assessed the growth of GDP per capita on the domestic level of GDP per capita and the human capital variable for 229 European regions and found that recent economic performance in the European region is strongly associated with increases in further education. In fact, measures of further education appear to perform more robustly and more relevantly than traditional measures of the capital stock in a regional economy. From a policy perspective, their

results suggest that even when skilled workers are unable to find suitable jobs, they are, on the whole, more profitable than their unskilled counterparts.

2. Method

This research is applicable in its purpose and descriptive and correlational in terms of data collection. The statistical data of the research for the developing country of Uzbekistan in the period 2022-2023 were extracted from the World Bank website. Then, the collected data were tested using Eviews9 software and the mixed data method. The model of this research is based on the Su & Liu (2016) model, which can show the effect of human capital as a factor intensifying the effect of FDI on economic growth. In addition, the model used is designed for unstable economies (such as the economies of developing countries), which is very suitable for this research. By examining the theories related to the simultaneous role of FDI and human capital in promoting growth, it is concluded that the data are placed in a total production model. Considering the empirical studies conducted in the field of investigating the factors affecting the export of agricultural products, the model used in this research (which is mainly taken from the study of Su & Liu (2016), is introduced in the following logarithmic form:

$$LEXP(t) = \beta_1 + \beta_2 LFDI(t) + \beta_3 LHCR(t) + \beta_4 LVAGR(t)$$

in which all variables are logarithmic and over time t with weight coefficients β and their description is as follows:

EXP: Total volume of agricultural exports at constant prices;
FDI: Amount of incoming FDI;
HCR: Human capital rate;
$VAGR$: Value added in the agricultural sector at constant prices.

Statistics and information for all variables are extracted annually for the period of 2022-2023, i.e. after the need for investment and industrialization of the agricultural sector of Uzbekistan, from the World Bank's set of indicators and economic reports (Eshov et al., 2021).

3. Results

As mentioned, the statistical data analysis method is the mixed data method for the developing country of Uzbekistan in the period 2022-2023. Initially, descriptive statistics were used to examine the trend of the variables. The descriptive results in Table 1 show that the average technology growth is high; while the percentage of FDI is very small. The population in the study area has not grown much, but physical capital and human capital have a high share. Also, the economic growth rate in the agricultural sector is somewhat high. The standard deviation value is not very high, which indicates a small dispersion of observations. Also, the value of the skewness coefficient and the coefficient of elongation show that the research data follow a normal distribution. In order to determine whether the data is pooled or panel data, the F test was used. The results of F-test are presented in Table 2. The value of the F statistic is 1.1 and its probability level is 0.39. Therefore, at a significance level of 5%, the null hypothesis based on the pooling of data is accepted.

Table 1:
Average statistics of economic variables in the agricultural sector

Variables	Mean	SD	Skewness	Kurtosis
Agricultural economic growth	3.13	4.56	-1.01	4.11
Population growth rate	1.78	1.50	1.39	4.87
Technology growth rate	20.56	15.01	-0.23	-1.13
Physical capital	25.55	7.11	0.35	-0.56
Human capital	45.41	15.32	-0.11	-1.45
FDI	2.34	2.51	1.31	3.98

Source: Authors' own findings

Table 2:
***F*-test results**

Results	p-value	Probability	F-statistics
Panel Data confirmed	0.001	0.39	1.1

Source: Authors' own findings

The Johansen-Josielius cointegration technique was used to examine the long-term relationship between the research variables. The results of the Johansen-Josielius cointegration test are presented in the form of the results of the effect matrix test statistic in Table 3. The cointegration vector (in the form of a cointegration equation) is also reported in this table.

Based on the cointegration test, the existence of a cointegration vector between the model variables is confirmed. According to the time series econometric literature, finding evidence of the existence of cointegration implies the existence of this relationship and the existence of a long-run equilibrium relationship between the variables can be confirmed. In view of this, the normalized cointegration vector with respect to the dependent variable is extracted and reported in Table 3.

The results of estimating the long-run relationship show that all three variables, FDI, human capital rate and agricultural value added have a positive effect on agricultural exports, which is in line with theoretical and empirical expectations. The effect of the first two variables is statistically significant at the one percent level, but agricultural value added does not have a significant effect on its exports.

Table 3:
Cointegration test between model variables

Cointegration effect matrix			
Critical value at 4%	**Value of the statistic**	**Alternative hypothesis**	**Null Hypothesis**
31.12	29.56	R=1	R=0
24.11	18.34	R=2	R≤1
14.98	6.89	R=3	R≤2
Cointegration vector			
LEXP	**LFDI**	**LHCR**	**LVARGR**
Dependent variable	0.61	1.62	1.00
SD	0.24	0.49	0.67

Source: Authors' own findings

4. Conclusion

FDI is one of the indicators that creates and improves economic growth, so that along with the creation of investment, other factors such as the entry of technology and knowledge will be brought. In this study, an attempt was made to examine this issue with regard to the theoretical foundations related to the discussion of the effect of FDI, as well as human capital and the interaction of the two on the economical development of the agricultural section. The current research was performed with the objective of examining the flow of FDI in the agricultural sector in Uzbekistan. In this regard, citing statistics and information from the World Bank and UNCTAD, it was found that firstly, the flow of FDI in the agricultural sector was very small compared to other sectors (such as industry). Also, on average, more than 40 percent of the inbound FDI flow is attracted by developed countries, and developing countries that have a greater need for investment in their agricultural sector have a weaker performance in attracting FDI. In this study, in order to provide analyses based on statistical inference, while introducing the research model and variables, the results of estimating the research model were reported for Uzbekistan. The results of estimating the long-term link of the variables showed that the FDI variable had a positive and significant effect on agricultural exports, and the elasticity of exports to this variable was about 0.6. Also, the human capital rate variable also has a direct and significant effect on agricultural exports. Although the sector's value added variable has a positive relationship with exports, the coefficient obtained for this variable was not statistically significant. Therefore, based on the results of this study, it is suggested that in order to obtain the most benefit from FDI in developing countries and its effects on the development of the agricultural section, special attention should be paid to the importance of introducing new agricultural technology and technology into the country and using human capital for production in this sector, improving infrastructure, and also enacting appropriate laws and regulations for this purpose. As the results showed, the sensitivity of the agricultural sections economic development to changes in the interaction of FDI and human capital is positive. Therefore, FDI can contribute to the growth of the agricultural sector by transferring appropriate technology, training human resources, and increasing productivity. Due to the limitations and problems that developing countries face, many industries in these countries face a lack of investment. In this regard, it is essential that the attraction of FDI is according to the needs of the country and the creation of new jobs in order to optimally utilize the vast human capital that exists in developing countries.

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Received 26.08.2024
Received in revised form 17.09.2024
Accepted 27.09.2024
Available online 28.12.2024