RESEARCH ON THE IMPACT OF FDI ON ECONOMIC GROWTH AND MARKET SCALE BASED ON OLS (EVIDENCE FROM UZBEKISTAN)

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Abstract: *This study uses OLS to analyze the impact of FDI on Uzbekistan’s economic growth and market size. The regression analysis results passed the 5% significance test. FDI has a significant positive impact on Uzbekistan's economic growth and market promotion. For every 1% increase in FDI, the increase in GDP is 0.44%; the increase in exports is 0.39%; the increase in total capital is 0.51%; the reduction in national rate of unemployment is 0.21%. FDI is necessary and effective for Uzbekistan.*

Keywords: *OLS, FDI, GDP, Uzbekistan, Market expansion*

Introduction

At present, FDI is still active on a global scale. FDI promotes the flow of capital and technology on a global scale. It can not only bring a large amount of capital to the host country, improve the level of human capital in the host country, but also bring advanced technology and management experience to the host country. For foreign investors, it has also promoted the development and expansion of overseas markets. Therefore, FDI is currently an extremely important international economic activity on a global scale.

Uzbekistan's FDI and GDP growth

Duo to the stable political environment and the deepening of opening up to the outside world, Uzbekistan's introduction of FDI has continued to increase. During the 28 years from 1992 to 2019, Uzbekistan imported approximately US$16.742 billion in FDI. Especially from 2010 to 2019, a total of US$12.964 billion of FDI has been introduced in 10 years, and the scale has increased significantly. The introduction of FDI in the past 10 years has accounted for 77.43% of the total in the past 28 years.

Generally speaking, the GDP level of a country/region is an important standard used to measure the level of economic development of the country/region. And it is also an important indicator for measuring the country/region’s FDI attraction. From the perspective of Uzbekistan's FDI as a percentage of GDP, from 1992 to 2019, FDI as a percentage of GDP was 1.8%, which is the average level in the past 28 years. This percentage rose to 2.0% in the 10 years from 2010 to 2019. By 2019, this percentage has further increased to 4.0%. FDI, GDP, and the percentage of FDI in GDP are all showing an upward trend, indicating that Uzbekistan's economy is growing rapidly, and the demand and environment for attracting FDI are getting better and better. Figure 1 shows the growth of FDI and GDP in Uzbekistan.

Uzbekistan's market size growth

The impact of FDI on the market is directly reflected in the changes in market size. This study selects three markets that have a strong correlation with FDI: capital market, labor market, and foreign trade market.

In the capital market, we take the Total Investment Capital Index (TIC) as the research object. In 1992, Uzbekistan's total investment capital was 5.865 billion U.S. dollars. In 2019,

this indicator rose to US$26.081 billion, an increase of 4.45 times over 1992, with an average annual growth rate of 5.68%.

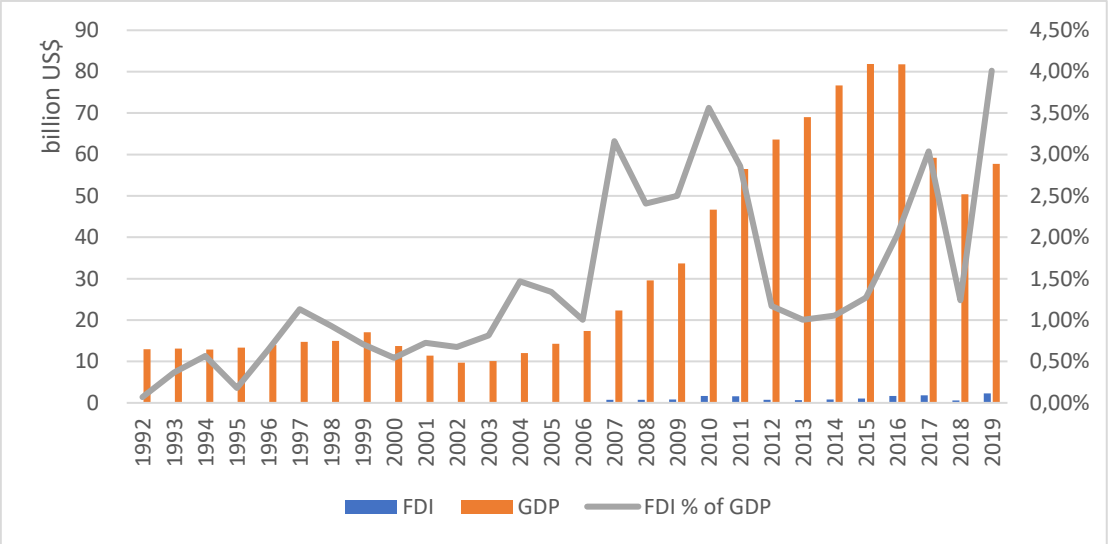

Figure 1 Uzbekistan's FDI and GDP growth

Data source: World Bank Open Data (https://data.worldbank.org/)

In the foreign trade market, we take the export trade value (EXP) indicator as the research object. In 1992, Uzbekistan's export trade volume was 2.735 billion U.S. dollars. In 2019, this indicator rose to 14.024 billion U.S. dollars, an increase of 5.13 times compared with 1992, with an average annual growth rate of 6.23%.

In the labor market, we take the National Rate of Unemployment (NRU) indicator as the research object. In 2000, Uzbekistan’s national rate of unemployment was 12.06%. In 2019, this indicator dropped to 5.65%. Uzbekistan’s national rate of unemployment declined rapidly from 2000 to 2007, and stabilized after 2007, showing an overall downward trend. Uzbekistan's total investment capital and export trade volume showed an overall upward trend during the 28 years from 1992 to 2019.

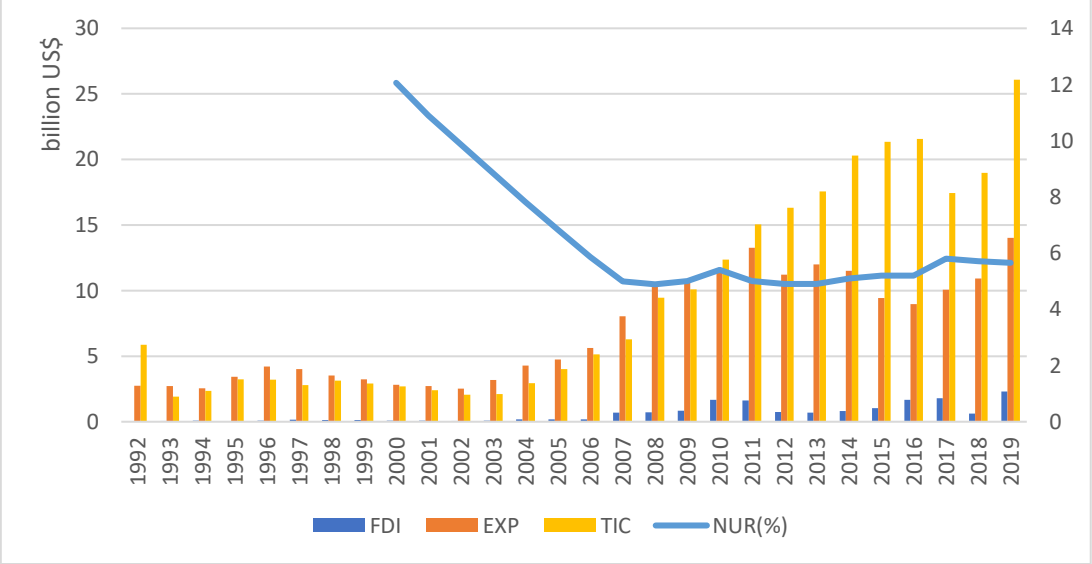

Figure 2 Uzbekistan's market size growth

Data source: World Bank Open Data (https://data.worldbank.org/)

These two indicators are positive indicators, and the increase in indicators means that

the capital market and foreign trade market have expanded during the reporting period. The National Rate of Unemployment (NRU) is a negative indicator, and the decline in the indicator means that the labor market has expanded during the reporting period. It can be seen that the scale of the above three markets has shown an expanding trend during the reporting period, which is positively correlated with the scale of FDI during this period.

Literature Review

On the whole, the theoretical research and empirical research of this type of research are relatively rich. In many documents, the research on China's FDI import and export FDI is concentrated. Guo Suzhen (2005) uses a combination of theoretical analysis and qualitative analysis to study the economic impact and effects of China's attracting FDI. She pointed out that the effect of FDI on regional economic development and the effect of regional economic development on FDI are mutually reinforcing. Meng Qingqiang (2016) used fixed effects analysis to analyze the relationship between FDI, human capital and economic growth, and constructed a panel data model based on the data of FDI, GDP and employment rate of 11 provinces in the eastern coastal region of China from 1989 to 2013. The influence of FDI on economic growth is analyzed, and it is concluded that the intermediary effect of human capital makes FDI have a significant positive impact on the economic growth of eastern China. Zheng Lei (2011) discussed China's investment in ASEAN countries and its economic effects from the perspective of comparative advantage theory and economic effect theory, and analyzed China's FDI investment drive in ASEAN countries from China's own economic development needs and international economic development trends.

In addition, some scholars are concerned about FDI-related fields in developing countries. For example, Li Taihuang (2012) used the method of empirical analysis to analyze the economic impact and effects of FDI in Vietnam by constructing a VAR model, and found that FDI has a positive impact on economic growth, employment rate pull, and technological upgrading. Gu Lishu (2014) studied the FDI development of the four new ASEAN countries, compared the scale and characteristics of China's investment in ASEAN countries with data from 2001-2012 as a sample, and conducted an objective assessment of the investment risks and opportunities of ASEAN countries.

Regarding Uzbekistan’s FDI, most of it is based on theoretical analysis and lacks the integration of empirical analysis. Although many scholars in the world have paid attention to Uzbekistan's economic development and its FDI attractiveness, they have not been able to give a scientific and reasonable explanation with quantitative thinking. This research combines the theories of economics and marketing and applies OLS to test the impact of FDI on Uzbekistan's economy and market. From the perspective of enhancing the effect of Uzbekistan’s FDI, this research gives marketing suggestions to promote economic growth, expand market size, and enhance product competitiveness. Different from previous researches focusing on FDI in Uzbekistan, this article adds research content on expanding the market scale. Therefore, this article provides a valuable supplement to the research on the effects of FDI in Uzbekistan.

As a developing country in Central Asia, Uzbekistan has practical needs to promote growth and expand the market. Is FDI necessary for Uzbekistan? How much can the FDI effect have on Uzbekistan’s economic growth and market size? This is the question that this research needs to answer. In the OLS model constructed in this study, FDI is the independent variable. The GDP, total investment capital, export trade volume and national rate of

unemployment are dependent variables. The model verifies the impact of FDI on economic growth and market size, and draws the conclusion that FDI is necessary for Uzbekistan’s economic growth and market expansion.

Research Methodology

Variable description

The method of this study is to capture the impact of FDI on GDP, export trade volume, total investment capital, and national rate of unemployment through ordinary least squares (OLS). The data from the World Bank supports this study's analysis of Uzbekistan from 1992 to 2019. The independent variable of the model is FDI. The dependent variables are GDP, export trade volume (EXP), total investment capital (TIC), and national rate of unemployment (NRU). According to the economic significance of the model, the natural logarithm of the variable data is taken.

Model Specification

To verify whether FDI has an impact on Uzbekistan’s GDP, export trade volume, total investment capital, national rate of unemployment. And how much impact it has. According to the theoretical basis, the functional forms of the models related to FDI and GDP, FDI and EXP, FDI and TIC, FDI and NRU used in this study are specified as follows:

Model 1: The regression model of the impact of FDI on Uzbekistan’s GDP:

$$\ln GDP_{ij} = \alpha 1 + \beta 1 \ln FDI_{ij} + e1$$

Model 2: The regression model of the impact of FDI on Uzbekistan’s export trade:

$$\ln EXP_{ij} = \alpha 2 + \beta 2 \ln FDI_{ij} + e2$$

Model 3: The regression model of the impact of FDI on Uzbekistan’s total investment capital:

$$\ln TIC_{ij} = \alpha 3 + \beta 3 \ln FDI_{ij} + e3$$

Model 4: The regression model of the impact of FDI on Uzbekistan’s national rate of unemployment:

$$\ln NRU_{ij} = \alpha 4 + \beta 4 \ln FDI_{ij} + e4$$

In the formula, i represents a certain country and j represents a certain year of observation. For the double logarithmic model, the economic significance of the variable coefficients is very clear. α is intercept term. β represents the FDI elasticity coefficients of GDP, export trade, total investment capital, national rate of unemployment. And e is random disturbance term.

Analysis and Results

Model testing

Ordinary least squares (OLS) method of regression was used to evaluate the slope of the coefficients of the autoregressive model. The use of OLS relies on the stochastic process being stationary. In the case where the stochastic process is not stationary, the use of OLS can result in invalid estimates. These estimates are called 'spurious regression' results thus high adjusted R^2 values and high t-ratios yielding results with no economic meaning. Stata16 is used for estimation, and the statistical significance level of 5% is uniformly set in the model. A total of 28 observations are included from 1992 to 2019 and 4 models are estimated to

capture the impact of FDI on GDP, export trade, total investment capital, national rate of unemployment of Uzbekistan.

Estimation of Model 1:

The estimation of model 1 being the FDI on GDP is expressed in the functional form below as:

Model 1:

$$\ln GDP_{ij} = \alpha_1 + \beta_1 \ln FDI_{ij} + e_1$$

Adopting Stata16, the estimation result is provided in table 1 below.

Table 1 OLS Estimation of FDI on GDP from 1992 to 2019

(Model 1) lnGDP				
Variable	Coef.	t	P>|t|	Std. Err
lnFDI	0.4442	8.72	0.000	0.0509
_cons	15.3292	15.47	0.000	0.9907
Adj R^2	0.7355			
F(1, 26)	76.09			
prob>F	0.0000			

Estimation of Model 2:

The estimation of model 2 being the FDI on export is expressed in the functional form below as:

Model 2:

$$\ln EXP_{ij} = \alpha_2 + \beta_2 \ln FDI_{ij} + e_2$$

Adopting Stata16, the estimation result is provided in table 2 below.

Table 2 OLS Estimation of FDI on export from 1992 to 2019

(Model 2) lnEXP				
Variable	Coef.	t	P>|t|	Std. Err
lnFDI	0.3907	11.96	0.000	0.0327
_cons	14.9021	23.44	0.000	0.6357
Adj R^2	0.8402			
F(1, 26)	142.96			
prob>F	0.0000			

Estimation of Model 3:

The estimation of model 3 being the FDI on total investment capital is expressed in the functional form below as:

Model 3:

$$\ln TIC_{ij} = \alpha_3 + \beta_3 \ln FDI_{ij} + e_3$$

Adopting Stata16, the estimation result is provided in table 3 below.

Table 3 OLS Estimation of FDI on total investment capital from 1992 to 2019

(Model 3) lnTIC				
Variable	Coef.	t	P>|t|	Std. Err
lnFDI	0.5105	7.55	0.000	0.0676
_cons	12.6682	9.64	0.000	1.3148
Adj R^2	0.6749			
F(1, 26)	57.06			
prob>F	0.0000			

Estimation of Model 4:

The estimation of model 4 being the FDI on national rate of unemployment is expressed

in the functional form below as:

Model 4:

$$\ln NRU_{ij} = \alpha_4 + \beta_4 \ln FDI_{ij} + e_4$$

Adopting Stata16, the estimation result is provided in table 4 below.

Table 4 OLS Estimation of FDI on national rate of national rate of unemployment from 2000 to 2019

(Model 4) lnNRU				
Variable	Coef.	t	P>|t|	Std. Err
lnFDI	-0.2090	-7.06	0.000	0.0296
_cons	1.3988	2.36	0.000	0.5927
Adj R^2	0.7200			
F(1, 18)	49.85			
prob>F	0.0000			

The 4 tables above show the estimation results for 4 models. The analysis result indicates that all the signs of the coefficients are in line with the theoretical underpinning. The t-ratios are more than 2, while all the probabilities are less than 0.05 which tells of the significance of the variables. The F Statistic shows a significant result with probability of F Statistic being 0.0000 which is an indication that the overall model is statistically significant. The value of adj. R^2 is close to 1, showing that the model is good and hence captures the maximum variations of the model.

Result analysis

Through the analysis of the impact of Uzbekistan's FDI on economic growth and market size, we have reached the following conclusions:

When this study applied OLS for verification, the regression analysis results passed the 5% significance test, which ensured the validity of the results in the economic sense.

For Uzbekistan's economic growth, FDI has a significant positive impact on it. From the economic significance of the regression results, for every 1% increase in FDI, the increase in GDP is 0.44%. This result is consistent with the situation in most countries.

For Uzbekistan's market promotion, FDI also has a significant positive impact on it. From the economic significance of the regression results, for every 1% increase in FDI, the increase in exports is 0.39%; the increase in total capital is 0.51%; and the reduction in national rate of unemployment is 0.21%.

The above results show that FDI has a significant role in promoting economic growth and market expansion in Uzbekistan. FDI is necessary and effective for Uzbekistan.

Conclusion and Recommendations

Generally, FDI has a positive impact on a country's economic growth and market expansion. Our conclusion supports its certainty in Uzbekistan. Under the premise that FDI is necessary for Uzbekistan, we recommend:

■ Formulate policies conducive to the introduction of FDI. These policies should be consistent, effective and operable. Some key policies should be tried in the pilot area first, and the policies should be revised according to the implementation effects to improve the feasibility of the policies.

■ Avoid the impact of FDI on domestic industries. When introducing FDI, private investment and public investment should be defined. For Uzbekistan, FDI should be a supplement to domestic investment for capital needs and technological innovation.

■ Improve the investment environment. The transparency of laws and regulations should be improved, the development of human capital should be promoted, market liquidity should be improved, and a standardized capital market should be cultivated.

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