Co-integration Analysis of Relationship between the Small Business Export Potential and Poverty Reduction in Uzbekistan

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Abstract- **One of the leading issues in modern economic theory and its applications is poverty. In this article, the association between poverty and small business export potential is analyzed using time series data. The main purpose of the paper is to show that there is long-term relationship between poverty reduction and increase in small business export potential. Findings of this article could be used as empirical evidence which support the idea that small business export is important in reducing poverty in developing countries. Cointegration analysis is used to estimate the long-term relationship in the dynamics of the variables. The study indicated that there is long-term negative association between export potential of small business and the growth rate of the share of the population who receives social transfers from government budget. Most empirical studies on poverty issues use cross sectional data, in this research we provided evidence using time series data and cointegration analysis method.**

Keywords: Data, cointegration, analysis method, socio-economic development, econometric, test.

I. INTRODUCTION

Today, the issue of poverty reduction is one of the priorities of the policy of socio-economic development in Uzbekistan. Low levels of poverty are important in ensuring the overall well-being of the population. In this regard, in accordance with the Decree of the President of the Republic of Uzbekistan No. PF-5975 dated March 26, 2020, the Ministry of Economy and Industry of the Republic of Uzbekistan was reorganized as the Ministry of Economic Development and Poverty Reduction of the Republic of Uzbekistan. According to the law, the Ministry of Economic Development and Poverty Reduction will focus on poverty reduction in the following areas:

- Develop, implement and coordinate long-term strategies and programs to ensure inclusive economic growth and poverty reduction;
- Develop specific mechanisms for poverty reduction and implement a regulatory framework;
- Implement measures to achieve national goals and objectives in the field of sustainable development and develop a methodology for calculating the subsistence minimum and the minimum consumer basket;
- Qualitative development of the labor market and its structure in cooperation with the Ministry of Employment and Labor Relations of the Republic of Uzbekistan;
- Other poverty reduction tasks.

One of the most widely used measures in the world to reduce poverty is the development of small and medium-sized businesses. Poverty is an important economic indicator. According to the World Bank, the poorest people are those who live on less than $ 1.90 a day. In this study, the share of the people who take social transfers from the government in the total population was taken as an indicator of the level of poverty.

Based on the literature review, the impact of the increase in the export potential of small businesses on the level of poverty is shown in Figure 1.
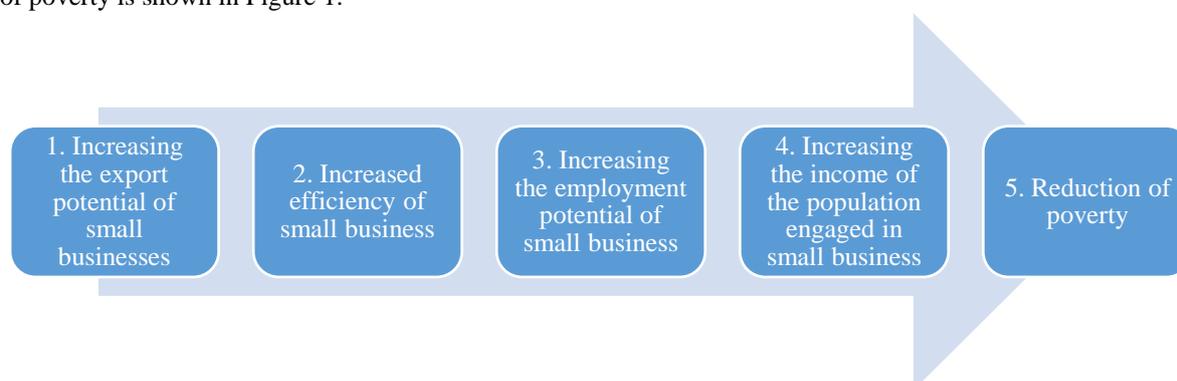

Figure 1. Diagram of the relationship between small business export growth and poverty reduction.

As can be seen from Figure 1, the increase in small business exports has an indirect effect on poverty reduction. An increase in the export potential of small businesses leads to an increase in efficiency in small businesses, as

the export price of the product is usually higher than the domestic market. In addition, in order to produce export-oriented products, the company strives to produce better products from better technology. Increasing the efficiency of a small business, in turn, increases the employment potential. An increase in employment, in turn, will increase incomes. An increase in the income of the population directly leads to a reduction in poverty.

II. LITERATURE REVIEW

In general, in the 21st century, the link between poverty reduction and small business activity is being widely studied and small business is seen as a key tool in poverty reduction. Initial studies looked at the poor as consumers [8]. According to this theory, if international corporations could sell their products to the poor, it would increase the welfare of the poor. This, in turn, will have a positive impact on the reduction of the poor. In his research, Aneel Karnani suggests looking at the poor as small producers rather than consumers [6]. Because the poorer part of the population produces more, the more they earn. An increase in income, in turn, leads to a reduction in poverty. Burkhanov A.[10;14], Tusunov B. [11;12;13], Karnani's hypothesis has been confirmed by many studies [9].

Furthermore, exports are an important tool for small businesses to find their place in international markets [5]. It is generally assumed that the export potential of a small business depends on how wisely it uses the resources in the area where the small business operates [2]. However, in addition to this traditional view, Oliver noted that local institutions have an impact on the business entity's export volume and potential [7].

III. METHODOLOGY

This article examines the cointegrational relationship between the increase in exports of small businesses and the reduction of poverty. The cointegration of time series was first mentioned in Granger's study [4]. Later, Clive Granger and Robert Engel developed a vector approach consisting of a system of several equations, taking into account the possible endogeneity problem [3].

Firstly, the study first verified that the time series data were non-stationary, but stationary in the first-order differences using Dickey-Fuller and Phillips-Perron tests. The regression results were then obtained using the least squares method, and the stationarity of these regression residues was checked using the Dikey Fuller and Phillips Perron tests.[1]

Data from the State Statistics Committee of the Republic of Uzbekistan on the share of the poor in the total population were used as an indicator of the level of poverty in the country. Data on exports of small businesses were also formed on the basis of data from the State Statistics Committee of the Republic of Uzbekistan.

IV. RESULTS

The graph in Figure 2 shows the dynamics of the share of the poor in the total population of Uzbekistan in 2001-2018. At the same time, we can see that the share of the poor is declining from year to year. This figure decreased from 27.5% in 2001 to 11.5% in 2018. The main downward trend began in 2005.
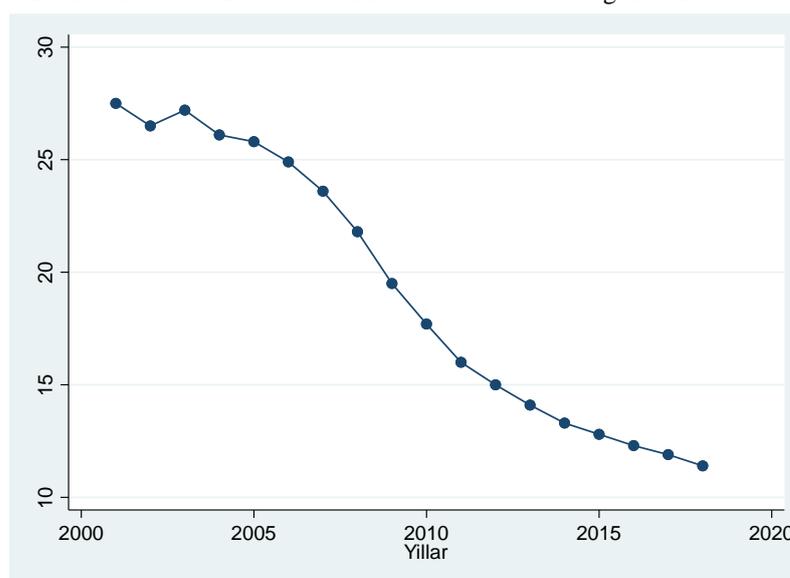

Figure 2. Percentage of low-income population in the total population in 2001-2018, percent
Source: Prepared by the author on the basis of data of the State Statistics Committee of the Republic of

Uzbekistan.

Figure 3 shows the volume of exports by small businesses in the Republic of Uzbekistan. Although the export potential of small businesses decreased in 2012 and 2013-2017, it can be seen that it has been growing since 2005.

The trends in Figures 2 and 3 show that there may be a link between a decrease in the share of the poor and an increase in small business exports.
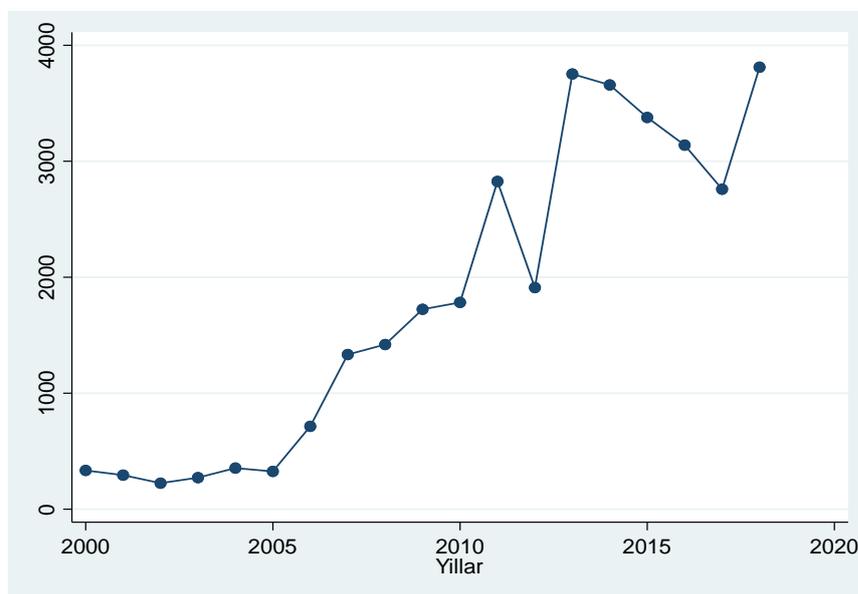

Figure 3. Exports of small businesses in 2001-2018, million US dollars
Source: Prepared by the author on the basis of data of the State Statistics Committee of the Republic of Uzbekistan.

Table 1. Descriptive statistics of variables included in the econometric model

Variables	Mean	Standard deviation	Minimum	Maximum
Natural logarithm of the relative change in the proportion of the people who take social transfers from the government.	-0.052	0.034	-0.111	0.026
Natural logarithm of small business export volume	7.230	0.999	5.413	8.246
Natural logarithm of government expenditure	6.827	0.301	6.453	7.363

Source: These calculations were performed by the author using the STATA 15 program.

Table 1 shows the descriptive statistics of the variables included in the econometric model. From this table it can be seen that all variables are included in the model in natural logarithm. This, in turn, simplifies the interpretation process and reduces the average variance in the variables.

In the next step, we check that the variables in the model are cointegrated. In doing so, we use Engle-Granger's two-step method [3].

To do this, we must first prove that each variable is nonstationary, but that the first differences are stationary. We use the Dickey-Fuller test.

Table 2. Variables included in the econometric model and their first differences

Variables	Computed tau statistics for the Dickey-Fuller test	Dickey-Fuller test statistics at 5% significance level	Computed tau statistics for the Phillips-Perron test	Phillips-Perron test statistics at 5% significance level
Natural logarithm of the relative change in the proportion of the people who take social transfers from the government.	-1.871	-3.000	-1.854	-3.000
Natural logarithm of small business export volume	-0.729	-3.000	-0.681	-3.000
Natural logarithm of government expenditure	0.791	-3.000	1.078	-3.000
Variables in first difference				
Natural logarithm of the relative change in the proportion of the people who take social transfers from the government.	-7.028	-3.000	-6.050	-3.000
Natural logarithm of small business export volume	-4.602	-3.000	-4.616	-3.000
Natural logarithm of government expenditure	-3.720	-3.000	-3.677	-3.000

Source: These calculations were performed by the author using the STATA 15 program.

From the data in Table 2, it can be seen that according to the results of the Dickey-Fuller and Phillips-Perron tests, we can`t reject the null hypothesis about the stationarity of the obtained variables at a significance level of 5%. This is because the statistical values calculated for both the Dickey-Fuller test and the Phillips_perron test do not exceed the limits of the values in the table.

Table 2 shows the results of the Dickey-Fuller and Phillips-Perron tests for the first-order differences in the variables, as well. Based on these results, we can reject the null hypothesis that each variable is nonstationary at a significance level of 5%. This means that all the variables included in the econometric model are non-stationary, but their first differences are stationary. This means that the first stage of the Engle-Granger method is satisfied.

In the second stage of the Engle-Granger method, a regression equation consisting of mutually cointegrating variables is constructed and the residuals are checked for stationarity.

$$LNPOVGR_t = -0.600 - 0.053LNEXP_t + 0.137LNGOVEXPEND_t \text{ (1)}$$

t-statistics   (-3.03) (-4.49)   (3.47)

F-statistics=10.57, R_2= 60.2%

In Equation 1, the variables are given in the following abbreviations:

$LNPOVGR_t$- Natural logarithm of the relative change in the proportion of the people who take social transfers from the government in period t;

$LNEXP_t$- Natural logarithm of small business export volume in period t;

$LNGOVEXPEND_t$- Natural logarithm of government expenditure in period t.

Before interpreting Equation 1, we check whether autocorrelation exists. We use the Breusch-Godfrey test.

Table 3. Breusch-Godfrey test results

Lags	Chi-square test statistic	Degree of freedom	p-value
1	0.020	1	0.887

Here:

H_0: no autocorrelation.

H_m : there is autocorrelation.

From the data in Table 3 it can be seen that we cannot reject the null hypothesis that there is no autocorrelation at the level of 5% significance. Because the p-value of the chi-square statistic is less than 0.05.

The next step in the Engle-Granger method is to determine whether the residuals of this equation is stationary.

Table 4. Checking the residuals of the regression equation given in Equation 1 for stationary using Dickey-Fuller and Phillips-Perron tests.

Variables	Computed tau statistics for the Dickey-Fuller test	Dickey-Fuller test statistics at 5% significance level	Computed tau statistics for the Phillips-Perron test	Phillips-Perron test statistics at 5% significance level
Residuals	-3.887	-3.000	-3.893	-3.000

According to Table 4, we can reject the null hypothesis, which states that the residuals of the regression equation is nonstationary, with a significance of 5%. This is because the test statistic values calculated for both the Dickey-Fuller test and the Phillips-Perron test are smaller than the test statistic values given at the 5% significance level. Thus, there is a cointegrational relationship between the export of small businesses, state budget expenditures and the share of the poor.

Equation 1 shows the impact of small business exports and state budget expenditures on the share of the poor. At the same time, an increase in exports of small businesses by 1% will lead to 0.05% decrease in the relative change in the share of the poor in the total population. An increase in state budget expenditures by 1% will lead to an increase in the relative change in the share of the poor by 0.14 %.

Both of the factors obtained in Equation 1 are statistically significant at the 1% significance level. The F-statistic is large enough that the equation at the 5% significance level is statistically significant in general. In addition, the determination coefficient is 60.2%. That is, the obtained independent variables explain 60.2% of the change in the dependent variable.

V.   CONCLUSION

In summary, the conclusions drawn from this cointegration analysis can be divided into two groups. First, from a methodological point of view, there is a cointegrational, i.e. a long-term relationship between the export potential of small businesses and the share of the people who receives transfers from government budget. In this analysis, Engle-Granger proved his point in a two-step analysis.

Second, this analysis shows that there is an inverse relationship between the increase in the export potential of small businesses and the share of the poor. This, in turn, means that export support for small businesses can be an important economic tool in reducing poverty in the long run.

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