

***THE COMPARATIVE ANALYSIS OF FDI AND REMITTANCE EFFECT ON ECONOMIC GROWTH IN CENTRAL ASIA***

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**Abstract**

The principal target of this empirical study is to deliver an investigation to analyse the effect of Foreign Direct Investment and International remittances on economic growth of the nations situated in Central Asia for the years 2009 – 2019. The panel data for the study was extracted from the World Bank Statistics. Gross Domestic product was chosen as dependent variable, while Foreign Direct Investment, International Remittances, Trade openness, Population growth indicators were selected as independent variables. The existing research analysis showed that the influence of FDI on economic progress is positive, while, mixed results have been found for the impact of International Remittances on economic growth. The regression analysis of econometric model was obtained from the following employed models: Ordinary Least Squares (OLS), Random Effects, Fixed Effects, GLS model. In order to avoid from the issues of multicollinearity, heteroscedasticity, cross-sectional dependence, some important diagnostic tests were conducted. The empirical findings of the study reveals that the FDI acquires statistically significant and positive relationship with economic growth, whilst, international remittances, population growth, trade have a statistically insignificant and negative correlation with economic development. It concludes that Foreign Direct Investment plays a key role in boosting the economic development of the selected countries.

**Keywords:** Foreign Direct Investment, International Remittances, Economic Growth, Central Asia, GDP, Trade Openness, Population Growth, Panel Data, Economic Development, FDI.

**INTRODUCTION**

The main aim of every country is to obtain more advanced economic growth and improve the living standards of residents. There are a multitude of issues in many aspects of growth process that developing countries facing today. Thus, the development process of economy need to be boosted with various economic policies. While there are many drivers effecting on the economic growth process, it is unwise to disregard the indispensable mission of FDI and Remittances as a chief influencer. It is commonly believed that Foreign Direct Investment(FDI), Remittances and Official development assistance are the chief factors leading to the growth in the economy of developing countries(Alfieri,2006). Both FDI and Remittances are vital tools for undeveloped countries to achieve economic growth, however, it is critical whether they are fundamental casual variables in terms of producing more benefits on the economic growth.

The impact of remittances and FDI on economic growth has been analyzed independently on previous papers. Comparing the importance of these factors as drivers of economic growth in Central Asia creates more interest on this paper and provides the novelty. Moreover, inclusion of

highly-significant variables in contrast to other written papers attracts more attention. For instance, Lehnert(2013), on his paper, included 6 variables, namely ODA, openness, democracy, governance, initial GDP per capita. However, On this paper, there are more vital variables chosen after long research of many previous paper included. (this part will have some amendments, left it to see changes)

### **Aims, Research questions and Objectives**

#### **Aim**

To discover which factor of economic growth, FDI or Remittances, works best providing better economic progression in Central Asia.

#### **Research questions**

1. Has Foreign Direct Investment brought a positive effect on economic advancement in these countries?
2. Have Remittances brought a positive impact on economic advancement in these countries?
3. Does the role of FDI outperformed the mission of Remittances in terms of improving economic growth in Central Asia?

### **Literature Review**

#### *Foreign Direct Investment*

Over the past decades, there has been done a great amount of research to find out clear relationship between FDI and Economic Growth, however, no precise explanation in terms of their positive or negative relationship has not been proposed. While, most of the papers describe positive relationship suggesting the enhancement of economic growth in many aspects comprising skills accumulation, technology transformation, capital acquisition, FDI negatively impacts on economic progression through worsening expenditure balances due to profit expulsion.

The main determinant of lasting progress from an economic point is the growth productivity, which is eventually reliant on technological advancement. Solow(1957) gave an insight on growth in yield as the consequence of technological advancement and capital accretion. Nevertheless, this model lacks of adequate evidence to clarify the origin and reason behind the existence of technological progress (A. Ek, 2007). The endogenous growth theory identifying technological advancement as an endogenous variable and stressing the significance of skills accumulation, arose as a result of this uncertainty (Smith, 2006).

The research by Nowbutsing (2009) notes that previous papers analysed the effect of FDI regarding the national income improvement and factors of production, such as, labour or capital. Adkhihary (2011) states that the theory of dependency depicts an undesirable relationship between FDI and economic development as the dependence of the certain state on international investment experiences a negative effect on their income distribution and economic progress, comparing to the theories noting that there is a positive association between these two economic factors. Kortajas (2010) states that HCFs(host country factors) that can have an impact on this association consist

those determinants, namely, financial development level, quality of institutions, infrastructure, human capital, and economic development level of a certain country.

M.Behname (2012) delivered research to find the impact of FDI on economic development of 4 South Asian countries in the period 1977-2009. Random effects model was chosen in the study after conducting unit root tests and Hausman (1978) test. The empirical results of this study showed that FDI positively influences on economic growth of these countries while explanatory variables, namely, population growth, technology gap, trade openness and inflation posed a negative relationship with economic growth. S.Kumar (2013) conducted study to investigate the effect of Foreign Direct Investment as a major driver on economic growth by utilizing panel data. In order to generate applicable empirical results, three different models, FEM, REM and PCSE and six distinct independent variables, Population growth, FDI, Education attainment, Savings, Inflation, GDP per capita were employed in the study. The findings by Generalized Least Squares (GLS) showed that the impact of Foreign Direct Investment on uplifting economic growth of investigated countries is highly significant. A.Ek (2007) conducted study to analyse the impact of FDI on economic growth of China by collecting data from 30 different regions of the country from 1994 to 2003. When all 30 regions were included in the regression model, the empirical results indicate a positive but negligible impact of FDI as a portion of GDP on GDP level. Taking this into account, 4 regions with the poorest indication and no FDI inflows were terminated, followed by the regression with 26 regions. The results indicate that there is a statistically significant correlation at 6% significance level between FDI impact and GDP level on this occasion while there is negatively-correlated relationship among population growth, Inflation.

A. Maalej (2007) stated that the higher productivity of FDI holds true as long as the host country has a minimum stock of human resources and is open to international trade. Targeting 42 developing nations in his study, Maalej found out a positive significant correlation between economic growth and foreign direct investment by using fixed effects model (FEM). The author concluded that with the extraordinary progress in communication means, the advancement of new technology, and the liberalization of trade in the new world economic climate, FDI attraction steps are even more important.

Moreover, Sh. Shaari (2012) delivered study to investigate the relationship between Gross Domestic Product and Foreign Direct Investment in Malaysia from 1971 to 2010. Unlike the above-mentioned studies, the author collected annual data and employed different models in the paper. Granger causality, Var Co-integration technique, Vector Error Correction models were incorporated in the study in order to prevent from errors and to identify the impact of FDI on GDP of the host country. Empirical results indicated that increase in the number of FDI inflow acquired a positive impact on the GDP of Malaysia. To be more precise, one percent rise in foreign direct investment amount poses a growth by 49,14 percent in the level of gross domestic product of Malaysia.

While majority of studies found out the significant relationship between FDI and economic growth of a country, there are a few number of past papers indicating insignificant correlation between them as well. K. Lyroudi (2004) delivered research on examining the existence and impact of Foreign Direct Investment on the economic growth levels of Eastern European countries and the US. By applying the Bayesian analysis model, empirical findings revealed that FDI comprised no significant correlation with economic development in analyzed countries. Author suggested from the results of

the analysis that escalating foreign direct investments in every country in order to uplift economic performance does not hold permanent truth.

Emmanuel Nketiah (2019) examined the correlation among economic growth, trade and foreign direct investment in Ghana for the years 1975-2017. Regression analysis, Pearson analysis and Augmented-Dickey-Fuller unit root test were implemented to analyze the secondary data collected from World Bank in the study. Utilizing Ordinary Least Squares model, the empirical findings showed that foreign direct investment had an impact on Gross domestic growth of Ghana, however, acquired no statistically significant correlation with GDP growth of host country. As a result, the study concludes by recommending strong steps to improve trade openness in terms of promoting exports and FDI inflows by creating an empowering and approachable atmosphere to ensure business activities in Ghana for production development dynamics.

### *Remittances*

A multitude studies have been conducted on defining the influence of Remittances on economic growth, ending up with opposing conclusions. Ukkeje(2013) have found out that Remittances acquire a positive influence on economic progress in undeveloped countries according to many views of various specific papers. A positive and vital long-run association has been depicted in Nepal, Bangladesh, India, Sri Lanka, while it has showed a negative relationship for Pakistan. A report by WB(2006) notes that poverty can be reduced with the help of Remittances by improving income level of households, leading to an increase in households' welfare and human capital by progress in business, health and education.

We observed that many studies finalize that Remittances and FDI comprise a positive impact on economic improvement. But, it is undeniable that these issues have not been defined precisely and need further analysis, research.

Dr. J. Ferdaous (2016) delivered study on exploring the relationship among FDI, International Remittances and economic development of selected 33 developing countries. Utilizing panel data for the period 2003-2014, the study discovered the statistically significant and negative correlation between economic growth and remittances, while positive impact of FDI on economic progress was observed. The investigation found out that the reason behind negative influence of remittances is that the majority of remittance receipts are not put to wise use, and that remittances to home country economies are often motivated by altruism rather than benefit. The author suggests that through formulating policy steps to channel remittances into economically viable uses, the maximum value of remittances can be obtained.

M. Ekanayake (2019) investigated the impact of remittances on economic growth and the effect of remittances on diminishing poverty level in 21 Latin American countries. The study utilized Autoregressive Distributed Lag(ADL), fully-modified least-squares methods in order to analyse the collected panel data. Using co-integration analysis, the empirical findings revealed that there was a positive influence of remittances on the economic development of most investigated countries in the long run, while varied impacts were observed in the short-run. Meanwhile, the results suggested that remittances were apt to decrease poverty levels in selected countries.

B. Fayiisa (2010) conducted study to investigate the aggregate effect of remittances on economic progress of 36 African countries for the period 1980-2004. The investigation used the framework of

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## VOLUME-6, ISSUE-6

conventional neoclassical growth by employing panel data. According to empirical findings, the author stated that there is a positive significant correlation between remittances and economic attainment. It was suggested that alternative approach to implement financial investment ought to be introduced in order to overwhelm unforeseen liquidity constraints.

### Data and Methodology

The data used in the study was extracted from official World Bank website. The data includes four Central Asian countries' respective statistics for the period between 2009 and 2018. Kazakhstan, Uzbekistan, Tajikistan and Turkmenistan's economic growth determinants are analyzed and the relationship among exogenous, indigenous variables are discussed utilizing the panel data described in the study.

Multiple variables improve data variability and minimize multi-collinearity problems, and panel data should contain an individual's exact discrete heterogeneity. For studying changing aspects variables, panel data is better suited than cross-sectional or time series data because panel data is better at identifying and determining effects that are difficult to identify and determine in either cross-sectional or time-series data. Using panel data also allows researchers to look at more complex interactive models including the impact of scientific variation or trade and industry sequences. Finally, panel data reduces the effects of aggregation bias by combining variables into large sets.

The paper investigates to analyse the main determinants of economic progress. It contains real Gross Domestic Product as dependent variable. After reviewing past empirical and theoretical studies, the correlation is investigated among foreign direct investment, remittances, trade openness and population growth.

Table 1.

Variables	Description of the variables	Measurement unit
Dependent variables		
GDP	The Real Gross Domestic Product	US dollars (\$)
Independent variables		
FDI	Foreign Direct Investment	US dollars (\$)
REMIT	Remittances inflow	US dollars (\$)
Trade	Exports + Imports	Annual percentage change
Popgr	Population Growth	Annual percentage change

**THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY**

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**The Dependent Variable:**

**GDP:** The Real Gross Domestic Product (GDP),(total output of a country);

Numerous past papers on finding the impact of FDI and Remittances on economic growth employed Gross Domestic Product as dependent variable. Empirical studies by A.Ek (2007), Sh. Shaari (2012), Dr. J. Ferdaous (2016) were conducted by taking GDP as dependent variable. In order to deliver analysis on stata, we transformed real GDP by employing natural logarithm (lnGDP).

**The Independent/Explanatory Variables:**

**lnFDI:** Foreign Direct Investment net inflows. Investing directly Foreign direct investment (FDI) is the term used to describe equity flows in the reporting economy (FDI). The sum of equity capital, earnings reinvestment, and other capital is the total capital. A type of cross-border investment in which an individual from one country has control over or significant influence over the management of a business in another country is known as direct investment. The ownership of 10% or more of the ordinary shares of voting stock determines the nature of a direct investment partnership. The numbers are in US dollars at the time of writing. . In order to deliver analysis on stata, we transformed real FDI by employing natural logarithm (lnFDI). We expect that FDI will have a positive impact on GDP.

**lnRMTS:** Personal Remittances inflow (current US\$). Personal remittances include personal transfers and employee benefits. All existing cash or in-kind transfers made or obtained by resident households to or from non-resident households are classified as personal transfers. As a result, personal transfers include all existing transfers between residents and non-residents. Employee compensation applies to the earnings of frontier, seasonal, and other short-term workers working in a non-resident economy, as well as residents employed by non-resident organizations. Personal transfers and employee compensation are the amount of two things specified in the sixth edition of the IMF's Balance of Payments Manual. The figures are in current US dollars. In order to deliver analysis on stata, we transformed remittances by employing natural logarithm (lnRMTS).

We expect that remittances will have a positive impact on GDP.

**Trade:** Exports+Imports(%of GDP)(World Bank),

Trade Openness is the sum of imports and exports normalized by GDP. Bilateral equity investment is closely associated with underlying trade trends, according to Mishra (2007). Via trade, investors can better obtain accounting and regulatory information on international markets, allowing them to invest in foreign assets. Tighter trade integration also reduces the chance of default. Finally, trade transactions have the potential to directly generate revenue. We predict that trade has a positive impact on GDP.

**Popgr:** Population Growth(Population growth (annual %), The exponential rate of growth of the midyear population from year t-1 to year t, expressed as a percentage, is the annual population growth rate for year t. The main definition of population is one in which all inhabitants are counted, regardless of legal status or citizenship.

Descriptive analysis

The results of 40 observations made over a 10-year period in 4 countries were analyzed utilizing panel data regression analysis in this report. Our panel data is defined as strongly balanced because it includes a time variable acquiring the matching number of dimensions as the other variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
country	0				
countryid	40	2.5	1.132277	1	4
year	40	2013.5	2.908872	2009	2018
lngdp	40	23.99725	1.441457	22.26871	26.18978
lnrmts	40	21.22042	1.078737	19.00685	22.75268
lnfdi	40	20.57039	1.539371	18.23927	23.56939
trade	40	75.06911	31.25774	29.74841	139.6759
popgr	40	1.869101	.4578748	1.192864	2.82285

Table 2. Summary Statistics

The discipline of vivid statistics is the objective description of a data's key features. The main difference between vivid statistics and inductive one is that they seek to review a sample instead of using the figures to think about the population that the sample of data is supposed to reflect. The illustrated statistics show that average gross domestic product level varies between 22,27 and 26,19 together with standard deviation equal to 1,44. According to the results, the variation in level of Foreign Direct Investment was between 18,24 and 23,57, with standard deviation comprising 1,54. The average remittances inflows from other parts of the world was 21,22. The average remittances rate varies between 19,00 and 22,75 with standard deviation of 1,079, while, the average trade openness proportion fluctuates between 29,75 and 139,68. Finally, the average population growth was equal to 1,87 with standard deviation of 0,46. The rate of average population growth differs between 1,19 and 2,82.

H. Green (2002) stated that the GLS model is a variant of OLS regression that relaxes the assumption of homoskedasticity and uncorrelated errors. In other words, OLS makes the assumption that  $Var(\epsilon) = \sigma^2 I$ , whereas GLS makes the assumption that  $Var(\epsilon) = \sigma^2 \Omega$ . For each pair of instances,  $\sigma^2 \Omega$  is an  $n * n$  symmetric invertible matrix with sloping basics representing inaccuracy variances and off-diagonal components representing error correspondences. With these col;mlnventions modified, GLS, not OLS, is the unbiased estimator in the class of linear balanced estimators with the variance of lowest sampling. As we can see from the table depicted above, it can be inferred that we encountered the biased significant error of p value in the indicator showing explanatory variable remittances. According to previous literature reviewed, we move to utilize GLS RE model in order to prevent unbiased results.

**Mode selection:RE**

RE model was incorporated to our study in order to calculate coefficient estimates. The chief distinction between RE and FE(Fixed) is that, the variation among units is predicted to show uncorrelation regarding independent variables in this model. The plus point is that it includes time invariant variables. The chief reason behind choosing RE is that we target to find out whether FDI and Remittances impose a positive effect on economic growth in Central Asia constructed on the data collected 2009-2018 randomly. The random effects model:

$$Y_{it} = \beta X_{it} + \alpha + U_{it} + \epsilon_{it}$$

Where *U<sub>it</sub>* is the between-entity error while, *ε<sub>it</sub>* is the within-entity error.

Ordinary Least Squares (OLS), and GLS (RE, FE) models are only a few of the regression methods available. Table contains the assumptions.

The Breusch-Pagan test for heteroscedasticity was used to determine the variance of the residuals. When the random variables in a model do not have the same finite variance, heteroscedasticity exists. We have the null hypothesis stating that constant variance exists, however, due to zero value of chitest, the null hypothesis should be rejected. It means that there is heteroscedasticity existing in our data, which depicts that Ordinary Least Squares method is not appropriate to utilize. To prevent biased effects when using GLS, we assured that the residuals were self-determining of one another. With the help of the command Parasan test on stata (parasan abs command), pr value of 1,252 were obtained, meaning that there is the absence of cross-sectional dependency.

<i>Method</i>	<i>Assumptions</i>
<b>OLS</b>	<ul style="list-style-type: none"> <li>&lt; All parametres of model is linear</li> <li>&lt; The residuals are significantly self-determining from one another and the data contains randomly sampled population</li> <li>&lt; There is a strong collinearity among explanatory variables</li> <li>&lt; The measurement of explanatory variables is done exactly, demonstrating no errors</li> <li>&lt; There is homogenous variance in the residuals</li> <li>&lt; There is a normal distribution in the residuals</li> <li>&lt; The residuals are expected to acquire value of zero</li> </ul>

<b>GLS</b>	<ul style="list-style-type: none"> <li>&lt; There is linearity in all parameters of model</li> <li>&lt; There is no strong collinearity among explanatory variables</li> <li>&lt; There is not normal distribution among the residuals</li> <li>&lt; There is not permanent variances in the residuals</li> </ul>
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Table 3. Assumptions

**Empirical Results**

First Ordinary Least Squares(OLS) model was utilized by regressing variables on Stata(Table 4):

```
. regress lngdp lnrmts lnfdi trade popgr
```

Source	SS	df	MS	Number of obs	=	40
				F(4, 35)	=	56.42
Model	70.1550251	4	17.5387563	Prob > F	=	0.0000
Residual	10.8791602	35	.310833149	R-squared	=	0.8657
				Adj R-squared	=	0.8504
Total	81.0341853	39	2.07779962	Root MSE	=	.55752

lngdp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnrmts	-.2002121	.116435	-1.72	0.094	-.4365877	.0361635
lnfdi	.4152955	.0851347	4.88	0.000	.2424629	.5881282
trade	-.0256363	.0033559	-7.64	0.000	-.032449	-.0188236
popgr	-1.026651	.2152985	-4.77	0.000	-1.46373	-.5895715
_cons	23.54645	4.018378	5.86	0.000	15.38871	31.70419

Table 4

According to the results illustrated on the above table, there is a significant correlation among FDI, Trade, Population Growth and GDP, while there is no statistically significant relationship between Remittances and GDP. The findings indicate that R square of the regression is equal to 0,86, indicating that this model can explain 86 percent in variation using the variables in the study. It can be concluded that whilst Foreign Direct Investment has a positive effect on GDP, trade and population growth impacts negatively on economic growth according to depicted results.

**.Diagnostic tests**

Before moving to the data analysis, we checked in case multicollinearity exists. This means that chosen two variables shows almost perfect linear relationship with each other. The coefficients estimates display instability and great inflations occur in standard errors. VIF(Variance Inflation Factor) command in STATA was incorporated to deliver a check test for multicollinearity. The main point is that whether variables shows a VIF values above 10 or not.  $1/VIF$ (tolerance) describes the multicollinearity degree.

We used the Variance Inflation Factor (VIF) command in STATA to check for any multicollinearity. We should be concerned if variables have a VIF above 10. The degree of collinearity is given by  $1/VIF$  (tolerance). A value lower than 0.1 corresponds to a VIF of 10, which means the variable could be a linear combination of other independent variables (UCLA, 2014). The results for our variables are shown in Table 2 below.

Variable	VIF	1/VIF
lnremittan~s	3.49	0.286284
lnfdi	3.44	0.290964
lnfcg	2.20	0.455230
popgr	1.52	0.657401
trade	1.42	0.706232
Mean VIF	2.41	

Table 5. VIF

As we can see from Table 5, the values of all independent variables are less than 10, meaning that these variables can be a linear combination of other independent variables

*Breusch-Pagan test (appendix A)*

For determining whether or not a regression model is heteroscedastic, the Breusch-Pagan test is utilized.

The test employs the following null and alternative hypotheses:

**Null Hypothesis ( $H_0$ ):** There is homoscedasticity (The residuals have an equal variance distribution)

**Alternative Hypothesis ( $H_A$ ):** There is heteroscedasticity (the residuals have not equal variance distribution)

We discard the null hypothesis and assume that heteroscedasticity exists in the regression model if the p-value of the test is less than any significance number (.05).

We reject the null hypothesis and determine that heteroscedasticity occurs in the regression model if the p-value of the test is less than any significance amount (i.e. =.05). To conduct a Breusch-Pagan examination, we follow these steps:

1. Make sure the regression model is right.
2. Determine the model's squared residuals.
3. Use the squared residuals as the response values in a new regression model.

4. Substitute  $n \cdot (R^2)_{\text{new}}$  for the Chi-Square test statistic  $X^2$ , where:

The letter  $n$  stands for the total number of observations.

**$R^2_{\text{new}}$ :** The new regression model's R-squared with squared residuals as answering values.

We reject the null hypothesis and assume that heteroscedasticity exists as long as the p-value of the Chi-Square test indicator with  $p$  (number of predictors) degrees of freedom is less than a definite amount of significance (05). Otherwise, the null statement is not rejected. It is known that homoscedasticity exists in this situation. The results show that we have the value of more than significance level. In this analysis, the null hypothesis demonstrates that error terms are constant, while alternative hypotheses assume that error terms in datasets do not always vary. The error terms are expected to have constant variation, our proof is homoscedastic, and the null hypothesis can't be ruled out based on the test findings.

We also checked for linearity, since linear regression tries to suit non-linear data with a straight line if the relationship between the response variable and the predictors isn't linear. After that, we typed '*acprplot*' generating an improved element-plus plot of residuals that can be utilized to detect data non-linearity. Exact deviations from the result for Remittances, FDI, trade and population growth were found out. By delivering investigation to check variables distribution with the help of '*Kdensity*', we discovered that these variables displayed little skewness altogether. Seeing that we have almost no problem with nonlinearity, we can move to the next step.

*Hausman test (appendix B)*

A. Ammari (2007) The Hausman test is utilized to realize whether there is a connection between independent variable and error words. In panel data analysis, the Hausman description test is used to differentiate between fixed effects and random effects model applications. This test is also significant in terms of identifying exponential regressors in the model, according to the author.

The estimation does not support the evidence to continue during the analysis due to the lack of endogenous regressors in the OLS regression evaluations. The null hypothesis, based on the Hausman test, states that there is no connection between residuals and explanatory variables, implying that the random effects pattern is right. On the other hand, the alternative hypothesis implies that the error terms and explanatory variables are strongly connected to the fixed effect model's gain. After paramount consideration of experiments to determine if the model is a collection or a random consequence, the following results were gained.

We conducted the Hausman test at 5 percent significance level in order to determine which model fits best to our study. The empirical findings indicated that we achieved the p-value of 0,3291, which inferred that the null hypothesis of the test can not be rejected. It is precise from the results that Random Effects model will be employed in our further investigation

### **Random Effects Results Interpretation**

O. Torres (2011) stated that if there is a reason to have a faith in the impact of variations among entities on the dependent variable, then it is advisable to select random effects. Since the unit's error term is not associated with the interpreters, time-invariant variables can be put into use as explanatory variables in random effects models. Random-effects methods include the definition of discrete characteristics that may have tendency to influence the response variable. The issue is that

certain variables might not be available, leading to model error due to missing variables. The detailed analysis and interpretation from RE regression will be delivered in the following:

```
. xtreg lngdp lnrmts lnfdi trade popgr, re

Random-effects GLS regression           Number of obs   =       40
Group variable: countryid              Number of groups =        4

R-sq:                                   Obs per group:
    within = 0.1289                      min =           10
    between = 0.9837                     avg =          10.0
    overall = 0.8657                     max =           10

corr(u_i, X) = 0 (assumed)              Wald chi2(4)    =      225.70
                                           Prob > chi2     =       0.0000
```

lngdp	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lnrmts	-.2002121	.116435	-1.72	0.002	-.4284204 .0279963	
lnfdi	.4152955	.0851347	4.88	0.000	.2484346 .5821565	
trade	-.0256363	.0033559	-7.64	0.000	-.0322136 -.0190589	
popgr	-1.026651	.2152985	-4.77	0.000	-1.448628 -.6046734	
_cons	23.54645	4.018378	5.86	0.000	15.67057 31.42233	
sigma_u	0					
sigma_e	.15086328					
rho	0	(fraction of variance due to u_i)				

Table 6

The above described table was achieved by using the required commands (xtreg,y\_x ,re) on Stata software program. In the model, it can be inferred from the illustration that there are 40 observations for four Central Asian countries during 10-year span. The results from RE regression indicates that although the value of R-square varies in three dimensions (between, within, overall), the overall R-square amount 86% indicates the comprehension of the model employing used variables in the study. Correlation indicator on the results implies whether changes among elements hold the correlation with one another using the regressing value of 0 in the REM model. It is stated in the economic theory that, if Prob>chi2 value is smaller than 0,05, the model is considered as satisfactory, implying further analysis of the coefficients and variables relationships.

*Remittances*

Starting the analysis of regressed results, we have to mention that the corresponding p-value is less than 0,05, which shows that there is a statistically significant relationship between remittances and gross domestic product. The value of coefficients has been found negative, indicating that one percent increase in the amount of remittances will cause 20 percent decrease in the value of GDP. This finding was supported by Dr. J. Ferdaous (2016) stating that the large number of remittances are not put to good practice, and remittances to home country economies are often prompted by pragmatism rather than profit, according to his empirical finding in the report,\

*Foreign Direct Investment*

The empirical results indicate that the p-value corresponding to the Foreign Direct Investment variable constitutes the amount less than 0,05, revealing that the statistical significant relationship occurs between FDI and GDP. The coefficient values infer that there is a positive impact of Foreign Direct Investment on the progress of economy. To be more precise, one percent rise in the value of Foreign Direct Investments triggers 41% growth in the value of Gross Domestic Product. Majority of the past papers mentioned in the literature review have found the significant effect of Foreign Direct Investment on the growth of GDP and Economic growth. Correspondingly, our empirical findings interpretations are supported by the studies by S.Kumar (2013) ,A.Ek (2007),A. Maalej (2007).

*Trade*

According the stata regression results, the respective p-value corresponding the trade variable comprises the value of 0,000 less than 0,05, which implies that there is a statistically significant relationship between trade openness and economic development. The value of coefficient defines that there is a positive correlation between respective variable. To be more detailed, one percent increase in the level of trade openness prompts a decrease of 2,5 percent in the rate of GDP. M. Behnam (2012) found out the same result stating that the trade openness is statistically significant and negative correlated with dependent variable of GDP.

*Population Growth*

The empirical findings generated by regression analysis states that there is a significant relationship between population growth and dependent variable GDP as we have the applicable p-value accounting for less than 0,05. The coefficient value generates an idea of negative impact of population growth on the economic performance of Central Asian countries. In other words, one percent increase in the population growth stimulates hundred percent decrease in GDP level. A.Ek (2007) and M.Behname (2012) achieved the same conclusions as we obtained in our regression analysis regarding the relationship between population growth and gross domestic product of 4 Central Asian countries.

**Conclusion**

The foremost objective of this paper was to compare the impact of Foreign Direct Investment and International Remittances on economic growth and to identify which development factor has affected most to the economic growth in Central Asia utilizing data from Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan for the periods 2009-2019. The RE model of GLS were incorporated in our investigation in order to find the relationship between dependent variable (GDP) and independent variables (Remittances, FDI, Trade openness, Population growth). After regression analysis on Stata program, we found out that the dependent variable is statistically significant correlated with all the explanatory variables. While FDI demonstrated a positive relationship with the GDP according to the regression coefficients, there is a negative correlation between GDP and remittances, trade openness, population growth. After analysing and interpreting the results generated by the regression model, The fundamental discovery was that Foreign Direct Investment outweighed International Remittances in terms of uplifting the economic progress of the selected countries. Moreover, first research question of the study was confirmed as the impact of FDI on the economic growth was found to be positive. However, second and third research questions were not maintained as we obtained opposed empirical findings indicating that there is negative relationship among GDP,

population growth, remittances, trade openness. We met the objective of the study by identifying FDI outperformance over remittances effect on economic growth.

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