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UNDERGRADUATE GUIDED RESEARCH

***Creating a FDI friendly economy: An analysis of
selected South Asian countries***

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Abstract

This paper studies the impacts that Economic Freedom and GDP of four South Asian countries (Bangladesh, India, Pakistan and Sri Lanka) have in attracting FDI. This study was conducted to examine whether FDI had a positive relationship with the other two independent variables.

Secondary data had been collected from the World Bank and Heritage Foundation. For appropriate model selection, the Hausman test has been conducted which renders evidence for the presence of a random effect. This paper had a critical observation of Economic Freedom and vividly discussed it. The emphasis had been put to the fact whether Economic Freedom improved in the countries selected and how they had been related on the FDI.

Keywords: Foreign Direct Investment (FDI), Economic freedom (EF), Hausman test, Fixed Effects (FE), Random Effects (RE), Ordinary Least Square (OLS).

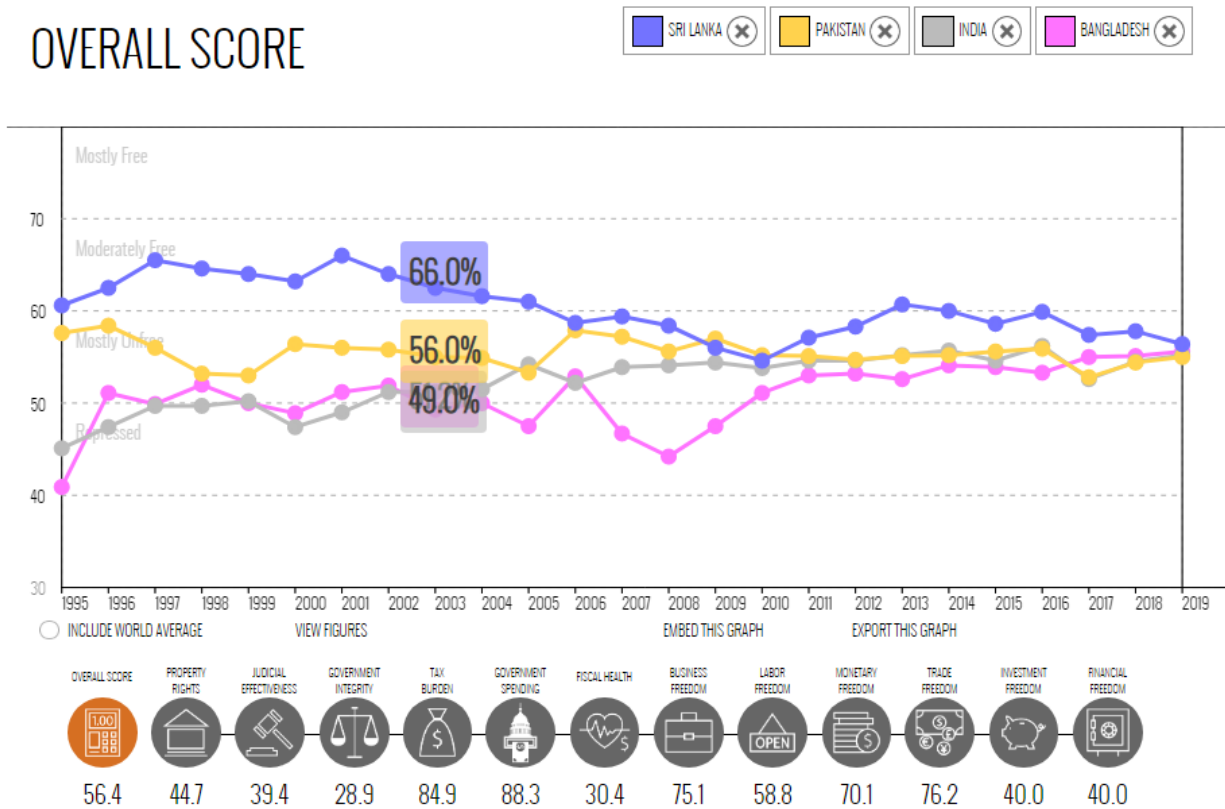
Introduction

Economic freedom (EF) refers to the freedom that a country has without interventions from Government and economic authority. Foreign direct investment (FDI) brings prosperity and development in a country and has a positive link with the economic freedom of a country. The country that has more economic freedom and stability is expected to attract more FDI, resulting in the development of the country. This paper will examine the relationship of economic freedom and GDP with FDI in Bangladesh, India, Pakistan, and Sri Lanka.

Liberty is not just having political freedom but also economic freedom. Working, producing consuming, owning, trading and investing without the intervention of others reflects the economic freedom that one has in a country. Also, the efficient financial system, macroeconomic environment, physical infrastructure, and proper law and order in an economy are important features in attracting FDI.

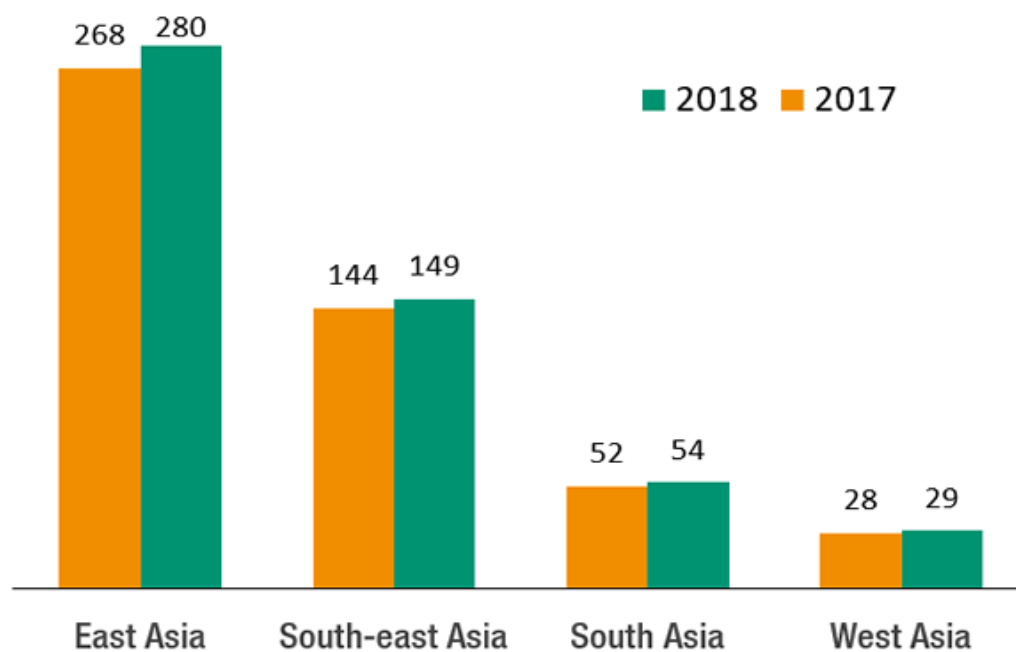
Based on stable exchange rates and openness of trade, investors would make decisions to invest in host countries. Depending on the investment climate of a country the investor decides which country is more profitable to invest. Because that South Asia is at a different stage of growth than other developed nations, we have to expect that the impact would be different.

OVERALL SCORE



This graph shows the Economic Freedom condition of Bangladesh, India, Pakistan, and Sri Lanka over the years 1995 to 2019. Sri Lanka is the blue dotted line that was above all the countries and was moderately free. After Sri Lanka, the yellow dotted line is Pakistan. The grey and pink lines belong to India and Bangladesh at the lowest levels of freedom struggling to get a stable level of EF reflected by the fluctuations. Over the years all four countries experienced a rise and fall of freedom. We can see during 2000 they all were in a good position and from 2008 to 2010 they had lowest freedom. But in recent years all the four countries managed to improve their economic freedom and stay in a stable condition. This paper will analyze if these conditions of country's freedom have a significant relationship with FDI.

The United Nations Conference on Trade and Development report says FDI inflows rose by 3.5% to \$54 billion. India received the highest FDI in the sub region and increased by 6% to \$42 billion. The manufacturing sector, communication, financial services, and cross-border merger and acquisition activities received highest FDI inflows. Bangladesh's inflows rose to a record level to \$3.6 billion and Sri Lanka's increased to \$1.6 billion. Only Pakistan experienced a decline of 27% to \$2.4 billion. Overall it can be said that South Asia's climate was stable enough to attract FDI. The following figure can support the claim.



We can see in this figure the latest year's improvement of FDI inflows in Asia from 2017 to 2018. Although South Asia did not make huge progress it did make some improvements.

India, Bangladesh, Pakistan, and Sri Lanka have been taking policy measures for continuous improvement and to integrate their economic condition with the rest of the world. The other countries except for Pakistan have experienced an upward trend of economic growth and enrichment in most macroeconomic indicators.

An analysis reveals that FDI is hugely national market-oriented in India and Pakistan, but concerned with export-oriented industries in Sri Lanka and Bangladesh. Although it reveals that

there is an upward trend of FDI in South Asian countries, more effective infrastructure investment and stable economic policies are needed to create a favorable investment climate to attract FDI into the countries.

So this paper will analyze the data gathered from the World Bank and Heritage Organization to prove the claim through OLS that South Asian country has indeed improved the inflow of FDI in the years taken and the GDP and Economic Freedom do share a positive relationship with FDI.

Overview of Economic freedom:

This research paper studies the relationship between FDI, GDP and Economic Freedom for the period 1999 to 2018 in Bangladesh, India, Pakistan, and Sri Lanka. FDI and GDP data are collected from the World Bank. Economic freedom data is taken from The Heritage Foundation. Economic Freedom is composed of a wide range of policy parameters like property rights, fiscal health, tax burden, government spending, labor freedom, business freedom, monetary freedom, trade freedom, investment freedom, and financial freedom. Each parameter is ranked from 0-100. The highest could be 100 which indicate the most flexible condition for trading, working, producing, and investing without the intervention of Government or any sort of restrictions of authority. Then the overall score of these parameters is taken as the equally weighted index of all of them. They are taken equally to prevent biased behavior towards any particular policy parameter.

Interestingly, all of the 4 countries had no judicial effectiveness and fiscal health freedom until 2016. Sri Lanka and India had a good range of judicial effectiveness in 2017 which improved more in 2018. Pakistan maintained its range and Bangladesh improved a bit. On the other hand, Bangladesh maintained a great range of Fiscal Health in both years. India and Pakistan improved but Sri Lanka declined. The countries even didn't have labor freedom till 2004 but maintained averagely since 2005. In the overall score Bangladesh and India experienced more freedom over time, Pakistan improved a bit but freedom in Sri Lanka declined.

Literature Review:

There are several studies that show that the inflow of FDI depends on the role of a country's macroeconomic environment and investment climate. For instance, Beck et al. (1991) showed a significant relationship between corruption and competitiveness in the United States. Singh and Jun (1995) analyzed several factors empirically and concluded that political and business conditions and macroeconomic variables have a great impact on FDI. Ayal and Georgios (1998) studied the influence that economic freedom has on investment by the use of the OLS method. The results indicated that economic freedom leads to economic growth.

Wei (2000) conducted an investigation where the results revealed that corruption was negatively related to FDI. Benassy-Quere et al. (2001) emphasized and showed that the very sudden changes in exchange rates proved to be deleterious for FDI. Chakrabarty (2001) showed that the stability of foreign exchange rate, freedom of trade and economic freedom were the major determinants of FDI. Similarly, Asiedu (2002) said that the development of infrastructure and free trade were important factors for the inflow of FDI. Scully (2002) used structural models to investigate the influence of economic freedom on economic growth. The study analysis revealed that economic freedom increases both economic growth and equity.

For Latin American countries Bengoa, Marta and Sanchez-Robles (2003) found that economic freedom and FDI were positively related. On the other hand, Cole (2003) used economic freedom index and analyzed several theories of economic growth to see the influence of economic freedom on economic growth. He found the relationship between them statistically significant. Similarly, Gordillo, Manuel, and Alvarez (2003) examined the relationship between economic freedom, political freedom, and democracy with economic growth. They used the Kiviet method. Although their results found an insignificant relationship between political freedom and economic growth, it showed a statistically significant relationship between economic freedom and economic growth. Analyzing the indicators of economic freedom by the

Heritage Foundation, O’Driscoll et al. (2003) showed the relevance of economic freedom with economic growth.

Chan and Gemayel (2004) stated that in the Middle East financial and political risks and instability were responsible for determining FDI. Doucouliagos and Ulubasoglu (2006) analyzed literature reviews of 45 different studies to examine the relationship between economic freedom and economic growth. Their analysis revealed that economic freedom and growth are positively related and economic growth without economic freedom as a determining factor would give biased results. Sekkat and Vezanones-Varoudakis (2007) discovered that trade freedom and the investment climate had an influence on attracting FDI inflow into the Middle East. On the other hand, it found GDP had no impact on FDI.

According to the World Bank there is a massive increase in FDI in developing countries in the last 10 years which implies that there has been an improvement in the investment climate and macroeconomic environment and it has been noticed by investors. This particular observation implies that there has been a change in the geographic distribution of FDI. Asia used to receive the highest FDI in the early 1990s which was taken by Latin America after their crisis. In the last two years, Asia has recovered and exceeded Latin America in FDI inflow.

Analysis of the data and Descriptive Statistics:

Descriptive Statistics of 4 countries for the years 1999-2018:

Variable	Observations	Mean	Std. Dev.	Min	Max
fdi	80	6.94e+09	1.26e+10	5.23e+07	4.45e+10
log_GDP	80	4.32e+11	6.71e+11	1.57e+10	2.73e+12
Log_EF	80	54.8475	4.127707	44.2	66

Descriptive Statistics of the countries individually for the years 1999-2018:

Country	Variable	Observations	Mean	Std. Dev.	Min	Max
Bangladesh	FDI	20	1.23e+09	9.81e+08	5.23e+07	2.94e+09
	GDP	20	1.20e+11	6.98e+10	5.13e+10	2.74e+11
	EF	20	51.07	2.99495	44.2	55.1
India	FDI	20	2.39e+10	1.60e+10	2.17e+09	4.45e+10
	GDP	20	1.39e+12	7.53e+11	4.59e+11	2.73e+12
	EF	20	53.055	2.328649	47.4	56.2
Pakistan	FDI	20	2.03e+09	1.56e+09	3.08e+08	5.59e+09
	GDP	20	1.73e+11	8.34e+10	6.30e+10	3.13e+11
	EF	20	55.305	1.314084	52.8	57.9
Sri Lanka	FDI	20	6.23e+08	4.18e+08	1.72e+08	1.61e+09
	GDP	20	4.78e+10	2.80e+10	1.57e+10	8.89e+10
	EF	20	59.96	2.930314	54.6	66

The table shows the descriptive statistics of dependent variable FDI and independent variables EF, and GDP. It is done for the four countries separately. We can see that the gap between minimum and maximum values is minor in all countries for FDI, GDP, and EF. Only Bangladesh has a slightly bigger difference in FDI minimum and maximum values compared to the other countries. Sri Lanka has the highest economic freedom and GDP but Bangladesh ranks the lowest in EF. The second position belongs to Pakistan whereas India is also low in the region. Comparing the market size, India has the highest and Sri Lanka the lowest.

Methodology:

Skewness test:

Variable	Observations	Pr(Skewness)	Pr(Kurtosis)	Adjusted chi2	Prob>chi2
fdi	80	0.0000	0.0025	29.52	0.0000
gdp	80	0.0000	0.0011	30.61	0.0000
EF	80	0.4137	0.2810	1.89	0.3890

The data in base form has skewness as shown in the table above. $\text{Pr}(\text{Skewness}) > 0$ implies positively skewed distribution for EF meaning using this variable in its base form can lead to imprecise estimates. The graph matrix is given in the appendix, table 2.1 and the skewness of Economic Freedom can be easily detected from there. So the data is converted to log form in order to correct for skewness, and it can be seen in the table 2.2 of graph matrix in the appendix that the problem of skewness no longer prevails.

The Econometric Model:

FDI is held as the dependent variable and so we have analyzed the relationship whether high GDP and economic freedom attract FDI into the countries by ordinary least square (OLS) test. The economic model is presented in the following equation:

$$(1) \text{LNFDI}_{it} = \alpha + \beta_1 \text{LNGDP}_{it} + \beta_2 \text{LNEF}_{it} + \epsilon_{it}$$

The model involves GDP and Economic Freedom that is influencing FDI in the countries. The EF data is converted to log to correct for skewness and the other two variables for uniformity and ease of interpretation. β_1 represents the percentage change in FDI due to 1% change in GDP and is expected to be positive based on theory. β_2 measures the percentage change in FDI due to 1% change in EF, and we can anticipate it to be positive also, meaning a country with higher economic freedom attracts higher amount of FDI.

Hausman Test:

This test is done to see if the data fits a Random Effect (RE) or a Fixed Effect (FE). If the unobserved variables are random then it is part of residual implying RE fits better, and if it is fixed then it is part of the intercept.

The Hypothesis:

H₀: The Random effect model is appropriate.

H₁: The Fixed effect model is appropriate.

The results are given below:

Variable	Fixed effect	Random effect	Variance	SE
Log_GDP	1.324271	1.190972	0.1332986	0.0940027
Log_EF	1.624862	3.447793	-1.822931	1.049274

The H statistics is 0.1602 which is greater than 0.05 so we cannot reject the null hypothesis at 5% confidence level. Therefore null hypothesis which states the random effect model is appropriate is accepted for the model in this paper. The results of the random effect model are presented below:

logfdi	Coef.	Std.Err	z-statistic	P>[z]
Log_GDP	1.190972***	0.0475618	25.04	0.000
Log_EF	3.447793***	0.8708461	3.96	0.000
_cons	-10.10883***	1.770635	-5.71	0.000

*** indicates p-value<0.01

There are 80 observations and the test reveals that EF and GDP can explain 89% of FDI inflow. The coefficients are given in the table along with respective standard error.

Then equation (1) can be rewritten with estimated co-efficients as follows:

$$(2) \text{LNFDI}_{it} = -10.10883 + 1.191\text{LNGDP}_{it} + 3.448\text{LNEF}_{it} + \epsilon_{it}$$

As the results clearly show a significant positive relationship between independent variables and FDI inflows in South Asia in the time period analyzed in the paper, the p-value is analyzed further to support the claim. The p-value is less than the significance level for both GDP and EF so we can reject the null hypothesis and conclude that the effect is statistically significant. The higher significance indicates that we can strongly reject the null hypothesis of insignificant co-efficient. It implies that FDI has a strong relationship and is depended on GDP and Economic Freedom of the countries. 1% increase in GDP causes FDI to rise by 1.191%, while 1% improvement in EF influences FDI to rise by 3.448%. The coefficients do have expected signs since the GDP and Economic Freedom both have positive signs.

Also, the R-squared is 0.8944 which is large and implies the regression model fits the observations. R^2 is a goodness-of-fit measure and 89.44% variance in FDI is explained collectively by variation in GDP and EF, meaning data fits the model very well.

Conclusion:

Economic freedom and GDP have positive significant relationships with FDI. In Bangladesh, India, Pakistan, and Sri Lanka high GDP and Economic Freedom does attract FDI into the countries. Later the Hausman test revealed that our model fits the random effect model best which implies that there are other unobserved factors that may attract FDI. The unobserved factors might be the percentage of residents, colonial history, and real exchange rate and so on. These could not be considered into the paper for limitation of time, money and unavailability of data. These may significantly be related to FDI in these four countries. However, the paper did observe that Economic freedom and GDP does have a role in attracting FDI and the unobserved factors going to residual indicate the factors that could not be considered by this paper for time constraint and data limitations.

The conclusive statements for this paper are that these four South Asian countries can improve or increase their FDI inflow by improving the macroeconomic condition and freedom of countries. There might be other factors too but Economic freedom does have a huge role in attracting FDI into countries.

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12. Index of economic Freedom

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Appendix:

Table 1.1: OLS estimation

```
reg logfdi log_GDP log_EF
```

Source	SS	df	MS	Number of obs	=	80
Model	36.7502439	2	18.3751219	F(2, 77)	=	326.14
Residual	4.33822527	77	.056340588	Prob > F	=	0.0000
Total	41.0884691	79	.520107204	R-squared	=	0.8944
				Adj R-squared	=	0.8917
				Root MSE	=	.23736

logfdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
log_GDP	1.190972	.0475618	25.04	0.000	1.096264 1.28568
log_EF	3.447793	.8708461	3.96	0.000	1.713717 5.181869
_cons	-10.10883	1.770635	-5.71	0.000	-13.63462 -6.583048

Table 1.2: Random effect model

```
. *Random effect
. xtreg logfdi log_GDP log_EF, re
```

Random-effects GLS regression

Group variable: country_no

Number of obs = 80
Number of groups = 4

R-sq:

within = 0.6863
between = 0.9970
overall = 0.8944

Obs per group:
min = 20
avg = 20.0
max = 20

corr(u_i, X) = 0 (assumed)

Wald chi2(2) = 652.29
Prob > chi2 = 0.0000

logfdi	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
log_GDP	1.190972	.0475618	25.04	0.000	1.097752 1.284191
log_EF	3.447793	.8708461	3.96	0.000	1.740966 5.15462
_cons	-10.10883	1.770635	-5.71	0.000	-13.57921 -6.638452

sigma_u	0				
sigma_e	.23496138				
rho	0	(fraction of variance due to u_i)			


```
. estimates store re
```

Table 1.3: Fixed effect model


```

Fixed-effects (within) regression                Number of obs   =       80
Group variable: country_no                     Number of groups =        4

R-sq:                                          Obs per group:
  within = 0.6958                               min =           20
  between = 0.9863                              avg =          20.0
  overall = 0.8870                              max =           20

corr(u_i, Xb) = -0.7543                       F(2,74)         =      84.65
                                                Prob > F        =      0.0000

```

logfdi	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
log_GDP	1.324271	.10535	12.57	0.000	1.114356	1.534185
log_EF	1.624862	1.36358	1.19	0.237	-1.09213	4.341854
_cons	-8.435632	2.463441	-3.42	0.001	-13.34415	-3.527118
sigma_u	.14700102					
sigma_e	.23496138					
rho	.28131194	(fraction of variance due to u_i)				

```

F test that all u_i=0: F(3, 74) = 1.53                Prob > F = 0.2146
. estimates store fe

```

Table 1.4: Hausman test:

```

. *Hausman test
. hausman fe re

```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re		
log_GDP	1.324271	1.190972	.1332986	.0940027
log_EF	1.624862	3.447793	-1.822931	1.049274

```

          b = consistent under Ho and Ha; obtained from xtreg
          B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

      chi2(2) = (b-B)' [(V_b-V_B)^(-1)] (b-B)
              =          3.66
      Prob>chi2 =          0.1602

. *Reason for log conversion
. graph matrix fdi gdp economicfreedom

. graph matrix logfdi log_GDP log_EF

```

2: Graph Matrix

Table 2.1: Variables at their base form

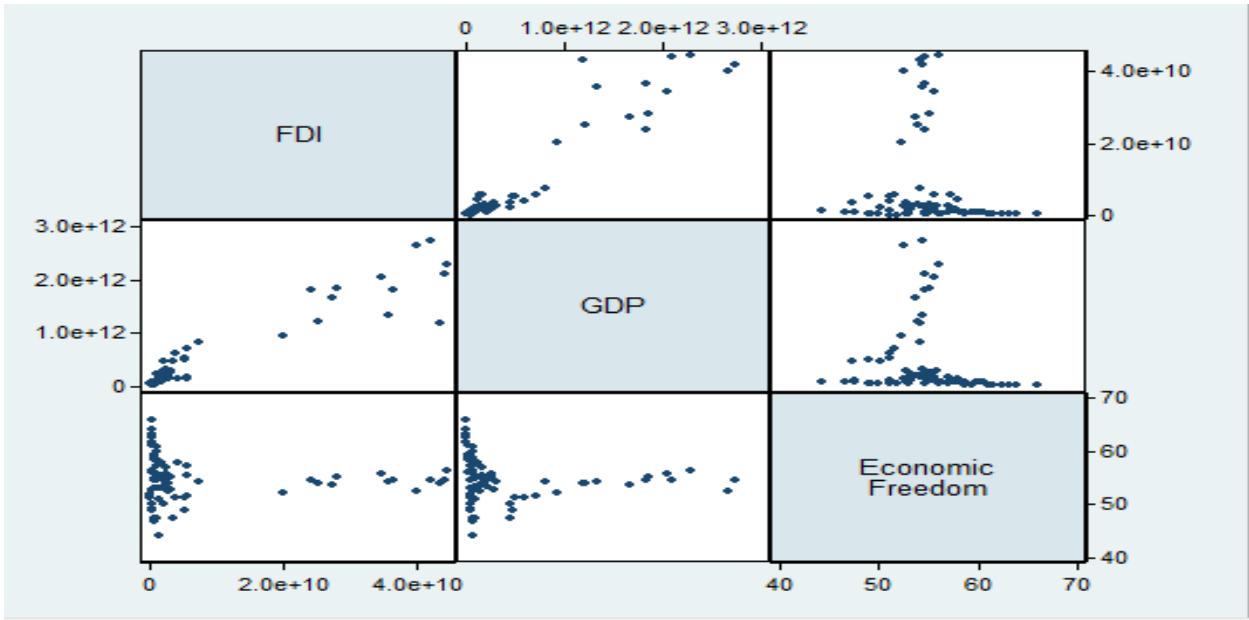


Table 2.2: Variables after log transformation

