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From Ashes to Achievements: Corruption is pulling back one of the achievement tools (FDI inflows) in Bangladesh

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Abstract

To draw the success story of Bangladesh in 100 years, Foreign Direct Investment will be one of the 'blood drops' as it provides many opportunities; creates employment, shares knowledge, increases specialisation and opens up more windows for regional and global trade, that are imperative to make a well-developed economy but the scenario of inward FDI in Bangladesh is not at a satisfactory level. Corruption is one of the drawbacks of this failure, while trade openness accelerates the amount of FDI inflows. This study is based on secondary data from 1986 to 2016. To examine the short-run and long-run impact of corruption and trade openness, Auto Distributed Lag (ARDL) bound test approach is used. The results reveal that in the long-run GDP, trade openness positively impacts FDI inflows, and corruption negatively affects FDI inflows in Bangladesh. Antithetically, in the short-run only trade openness positively prolongs the inward FDI. The empirical results are confirmed by robustness checking.

Keywords *Corruption . Foreign Direct Investment . Bangladesh.*

1. Introduction

Now Bangladesh is the 31st largest economy in the world and will be 28th by 2030. It is hoped that it will be the 23rd largest economy by 2050. To fulfil the goods demand of a large population, making a new position in the world market, and keep the existing situation, Bangladesh needs a considerable amount of Foreign Direct Investment. In 2018, Bangladesh received USD 3613 million, which is 68% higher

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from 2017. However, this amount is not sufficient enough. The USA remains the largest single recipient of FDI in the world. In 2017 and 2018, it received USD 252 billion and USD 277 billion. The 2nd position was followed by China which was USD 139 billion in 2017 and USD 134 billion in 2018. Whereas India, a neighbour country of Bangladesh, received USD 42 billion in 2018 (UNCTAD, 2019).

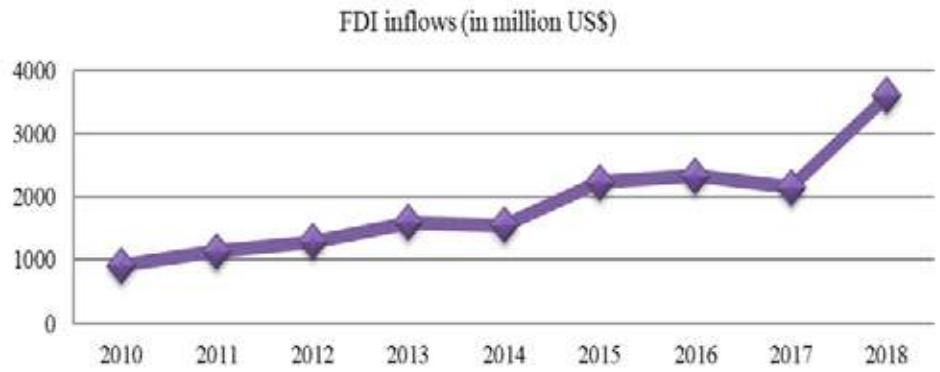
Bangladesh's Government is on the way to making 100 special economic zones by 2030 and has already been giving FDI a significant boost. Former BGMEA president Abdus Salam Murshedy said that the Bangladesh government is offering all facilities to foreign investors at SEZs to attract investment. The market economy, population and location have made Bangladesh highly important to its neighbours. The government has undertaken significant projects such as Padma Bridge, Rooppur Nuclear Power Project and LNG terminals, and these also worked as incentives for foreign investors.

The geographical position of Bangladesh is very appealing for regional trade. However, the country has not been able to take advantage of intra-regional trade. Foreign direct investment and trade openness are often seen as imperative economic indicators. From the literature, it can be stated that the higher the trade openness, the greater the FDI inflows in Bangladesh. According to a report published by the US Department of State, corruption remains a severe drawback to investment and economic growth in Bangladesh. The American Chamber of Commerce, Bangladesh (AmCham) released a report. This report reveals that corruption has a corrodent impact on the broader business market climate and opportunities for US companies in Bangladesh, and corruption deters investment and stifles economic growth.

Foreign investment has increased GDP for the most recent two decades in Bangladesh. FDI gives significant advantages such as innovation, capital, managerial aptitudes, enterprising limit and access to general markets. These recently referenced factors are fundamental for making countries industrialise and open to more work. Factors that upset FDI flows include administrative weight and insufficient physical infrastructure (Basnet& Pradhan, 2014).

Most of the monetary portions are overseen by FDI in Bangladesh. From those fragments, we can get the economic yield that is dedicated to the GDP. Right now, GDP has a prompt and circumlocutory relationship in a country. The examination will help the government and policymakers seek out the most basic division, which has more impact on economic development. From the beginning of freedom, Bangladesh began to attract FDI for money-related improvement. All through the past two decades, the flood of FDI into Bangladesh has broadly expanded because of the giving of certain offices to the foreign financial specialist, for instance, corporate duty holidays, avoidance of twofold expense appraisal, the holiday for infrastructure investment, money motivating forces and fare endowments, remittance of sway, particular skill and specialised help charges and some more.

Figure 1: Present scenario of FDI trend in Bangladesh



Source: *Bangladesh Bank, 2018*

In 2010 we received only 913. Thirty-two million USD FDI inflows and from 2011 to 2013, FDI inflows were progressing, but in 2014 the FDI inflows decreased, and the amount was 1551.28 million USD. In 2018 Bangladesh received an outstanding amount of FDI inflows of 3613.30 million USD, the highest in these decades.

Despite the way that various offices are given by the Government to the foreign investors anyway, the flood of FDI is still inadequate. In any case, there has been constantly a solid positive connection between FDI and GDP.

Table 1: Share of FDI in GDP Growth (2010- 2018)

Year	FDI Inflows percent of GDP
2010	1.07
2011	0.98
2012	1.19
2013	1.74
2014	1.47
2015	1.45
2016	0.86
2017	0.72
2018	1.07

Source: *WDI, 2018*

In Bangladesh, FDI's contribution to GDP growth is not at a satisfactory level. In 2010, the share was 1.07%, but after that, the FDI share continuously decreased except in 2013, when the FDI share upturned to 1.74%, which was unheard of in this decennary. Investment friendly environment, special economic zones, and more incentives for foreign investors are indispensable for attracting more FDI inflows.

FDI can likewise produce local investment in coordinating assets, encourage the movement of innovation and administrative abilities, increase nearby market rivalry, make current openings for work, support worldwide market access for trade wares, and so on. All of which ought to eventually add to economic development in host nations. Perceiving these benefits, developing countries have commonly eased limitations on FDI since the mid-1980s. In 2012, developing nations got the more significant part of worldwide FDI inflows ($703 billion), and upwards of 9 of the 20 biggest FDI beneficiaries were developing countries (World Bank, 2012).

Corruption is one of the obstructions that downsides FDI inflows. Bangladesh has ranked fourteenth among the most degenerate nations, as indicated by the Global Corruption Perception Index 2019 released by the Berlin-based Transparency International.

Table 2: Corruption Perception Index

Country Name	CPI 2015		CPI 2016		CPI 2017		CPI 2018	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Bangladesh	25	139	26	145	28	143	26	149
India	38	76	40	79	40	81	41	78
Pakistan	30	117	32	116	32	117	33	117
Sri Lanka	37	83	36	95	38	91	38	89

Source: *Transparency International, 2018*

In South Asia, Bangladesh ranked the second most reduced, just before war-torn Afghanistan. The CPI index, which positions 180 nations by their apparent degrees of open division corruption dependent on discoveries by universally trustworthy review sources, utilises a size of zero to 100, where zero is exceptionally degenerate, and 100 is highly corrupted. The current year's average score was 43, and Bangladesh scored 26, somewhat over a portion of the normal. The country's most recent position is thirteenth, starting from the bottom, from seventeenth in 2017. Pakistan scored 7 focuses more than Bangladesh to situate itself at 117, a spot of 32 stages in front of Bangladesh (The Daily Star, 2018). The CPI granted a score of 40, ranked 81st in 2017 and scored 41 and 78th in 2018. While India is doing not that good, it stayed to make the same score after the most recent couple of years.

The study aims to assess the behaviour of corruption and trade openness on FDI inflows in Bangladesh by establishing short-run and long-run equilibrium relationships using the ARDL approach. It attempts to forward some recommendations that may be helpful to making prosperous Bangladesh in 100 years.

2. Literature Review

2.1 Theoretical Framework of Foreign Direct Investment

Transaction Cost Approach: The exchange cost approach is spearheaded by R.H. Coase and summed up by Williamson (1979). FDI is seen as an authoritative reaction to imperfections in intermediate products, information and capital markets looked at by TNCs. The hypothesis declares that the best organisation achieves efficiency by reducing transaction costs. The foreign market accessible to a Transitional Corporation (TNC) does not want to praise the potentiality of other firms where it can profit by utilising its innovation, know-how, brand name or creation forms. The firm with this norm delivers a self-made market structure using investment in different nations, and in this manner, the firm makes the required market to fulfil its targets.

Microeconomics Theory: The microeconomic hypothesis was presented by Hymer (1960, distributed in 1976). This theory is viewed as a landmark in the quest for FDI. Hymer said that there were two reasons behind the internationalisation of organisations. One is variables related to the organisation's measurement and ownership of factors of production, and another is about the existence of market disappointments.

Internalisation Theory: Buckley and Casson (1976) conceptualised the internalisation hypothesis. The market imperfections approach to FDI is considered an internalisation hypothesis and hides exchanges inside a firm. Directing business remotely between two firms-in different nations, it appeared profitable to maximise profits by doing business inside, with national limits.

Oligopolistic Theory: Knickerbocker (1973) presented an "oligopolistic response" to clarify why firms follow their rivals into foreign markets. According to the hypothesis, FDI flows are a strategic imprint of firms in the global market. There is a reliance on the firms on other firms in the oligopoly market as one firm's decisions have an immediate impact on another firm.

Traditional Explanation of FDI: FDI can likewise be sorted dependent on the rationale behind the investment from the investment firm: Resource seeking or supply oriented - Investments that try to procure factors of creation that are more productive than those realistic in the home economy of the firm. These resources may not be accessible in the home economy by any means (for example, modest work and characteristic resources).

Market seeking- Investments that focus on either infiltrating new markets or keeping up the existing ones. FDI of this sort may likewise be utilised as a guarded methodology. It is contended that businesses are bound to be pushed towards this kind of investment out of the dread of losing a market instead of finding another one (Dunning, 1993).

Proficiency seeking – This investment will increase effectiveness by exploiting the benefits of economies of scale, scope, and joint ownership. It is recommended that this kind of FDI comes after resource or market-seeking investments have been acknowledged, with the desire to increase further the firm's profitability (Dunning, 1993).

Strategic resource seeking – FDI aims to ensure or expand the contributing firms' current explicit advantages and diminish those of their rivals.

2.2 Literature Review Related to Subject Matter

Foreign direct investment flows from nations where profitability is low to countries where profitability is high. It implies along these lines that capital is portable both broadly and globally. Here and there, the suggestion is that nations with bottomless capital should fare and countries with less capital should import. Busse and Hefeker (2008) and Gastanaga et al. (1989) examined the impacts of different institution indicators on FDI utilising panel information from 83 developing nations and 49 less-developed nations. Some years ago, no significant relationship was found between corruption and FDI. Zhao et al. (2003) likewise discovered proof of a negative connection between corruption and FDI by utilising information from 40 nations for a long time.

Egger and Winner (2006) did a comparative investigation of two-sided FDI panel information from 21 Organization for Economic Co-activity and Development (OECD) country sources and 59 beneficiaries. They discovered proof of corruption's negative impact on FDI.

In another comparable examination, Wei (2000) utilised information from 12 FDI source nations and 45 beneficiary nations and discovered the negative impact of corruption on FD Liargovas and Skandalis (2012) uncovered that trade receptiveness contributes decidedly to the inflow of FDI in developing economies over the long haul. They utilised an example of 36 developing economies from 1990 to 2008.

Sabir et al. (2018) revealed results for India, Iran, and Pakistan over the period 1982-to 2012. Fixed Effect and Pooled OLS methods are utilised to examine the panel information for estimating individual country impacts. They indicated that higher trade openness has a significant positive effect on FDI inflows. The outcomes likewise examined that FDI inflows appear to be influenced significantly by traditional determinants such as Exchange rate, Inflation and GDP per capita.

Kakar and Khilji (2011) said that trade openness and foreign direct investment are firmly related according to the economic development of Pakistan and Malaysia from 1980-to 2010. They used the Johansen co-joining test to evaluate the idea of a relationship, and the Granger causality test was used to decide the causality direction in the model.

Seyoum et al. (2013) said there is a connection between trade openness and FDI inflows in 25 Sub-Saharan African countries. They used the granger causality

test from 1977 to 2009 and found a bidirectional causal relationship between trade openness and FDI inflows in these African nations.

Canare (2017) revealed that corruption harmed inward FDI in 46 Asia and Pacific countries from 2006 to 2013.

Ohlsson (2007) showed that corruption negatively and significantly affects FDI inflows in 46 developing countries' time range from 1997 to 2004.

3. Sample and Measurement

This study is based on secondary data, ranging from 1986 to 2016. This study's dependent variable is FDI inflows (% of GDP). Independent variables consist of corruption, GDP growth, trade openness, and democratic accountability, and trade openness is the proxy for Trade % of GDP.

Table 3: Variable's Explanation

Variables	Explanation	Notation	Expected sign	Source
Gross Domestic Product % of Annual Growth	GDP growth rate is the percentage mutation in the value of the goods and services produced by a nation during a year compared to an earlier year. The GDP growth rate is used to look at the comparative progress of an economy over time.	L (GDP)	(+)	World Bank
Corruption	Corruption is behaviour that yaw from the formal duties for private gains, and it is a composition of dishonesty undertaken by a person or institution with a position of power. The greatest obstacle to economic and convivial development is the continuous practice of corruption.	L (COR)	(-)	International Country Risk Guide (ICRG)
Trade openness	**Trade openness** is the combination of economic and business policies that either intervene or attract trade between countries. Trade openness is the subject of economic benefits, including; technological transfer, skills sharing, increased labour supply, productivity improvement and thus improved economic growth and development.	(LOP)	(+)	World Bank
Democratic Accountability	In a democratic ambience, citizens can make a decision, and without angst, they can express their opinion. The government is responsible for any feedback from any decision and is answerable to its citizens. Most democratic governments respect their opposites and welcome their suggestions. Democratic accountability helps to make a peaceful nation.	L (DMA)	(+)	International Country Risk Guide (ICRG)

4. Model Specification

This study aims to model the impact of corruption on FDI inflows. So the following model proposes to explain the goal DI=f (Corruption, GDP growth, Trade openness, Democratic Accountability)

In econometrics form:

$$FDI_t = \beta_0 + \beta_1 COR_t + \beta_2 GDP_t + \beta_3 OP_t + \beta_4 DMA_t + u_t \quad \text{..... (1)}$$

By using natural logarithm form,

The econometric model is given below

$$LFDI_{i,t} = \beta_0 + \beta_1 LCOR_t + \beta_2 LGDP_t + \beta_3 LOP_t + \beta_4 LDMA_t + u_t \quad \text{..... (2)}$$

t = 1,…, T where T = 1984 to 2016, L= Natural Log. B_1 to β_4 to be estimated to find out the result, and μ_t is the error term that is normally distributed.

5. Data Analysis Technique

Eviews 9 will be used for unit root tests and econometrics analysis. Unit Root test is performed to test the stationary of the variables. It is found that variables are stationary at I (0) and I (1). It can be concluded that selected variables are static in mixed order. ARDL is performed to explain the goals. After performing ARDL, Dynamic ordinary least squares (DOLS) are performed for long-run Robustness checking.

6. Econometric Model

Engle and Granger (1987) and Johansen (1988&1991) tests are the most popular methods to check the long-run equilibrium relationship (Cointegration). These methods require all the selected variables to be stationary at first difference; I (1). The Autoregressive Distributed Lag (ARDL) bound test approach to overcome this limit. It was developed by Pesaran et al. (2001) and is the most widely accepted method. When all the variables in a model are stationary in mixed order, I (0) or I (1), then we can apply the ARDL approach. Our unit root result confirms that our selected variables are stationary in mixed order. Table 2 represents the Unit root result.

So we can apply ARDL, and our proposed ARDL model is given below:

$$\Delta L(FDI_t) = \beta_1 + \beta_{2i} \sum_{i=0}^{m} \Delta L(COR_{t-i}) + \beta_{3i} \sum_{i=0}^{m} \Delta L(GDP_{t-i}) + \beta_{4i} \sum_{i=0}^{m} \Delta L(OP_{t-i}) + \beta_{5i} \sum_{i=0}^{m} \Delta L(DMA_{t-i}) + \beta_6 L(COR_{t-1}) + \beta_7 L(GDP_{t-1}) + \beta_8 L(OP_{t-1}) + \beta_9 L(DMA_{t-1}) + \varepsilon_t \quad \text{..... (3)}$$

Where m is the optimal lag, Δ is the symbol of the first difference operator, $\beta_{2,}$ $\beta_{3,}$ $\beta_{4,}$ $\beta_{5\ are}$ short-run coefficients, and $\beta_{6,}$ $\beta_{7,}$ $\beta_{8,}$ β_9 are long-run coefficients, and ε_t is the white noise error term.

Before applying ARDL, we have tested unit root through the Augmented Dickey-Fuller test (ADF). We have conducted a bound test using F-statistics to find out about long-run cointegration. The null hypothesis is no cointegration

among variables. When F-statistics exceed the upper bound, we can reject the null hypothesis, meaning there is long-run cointegration among variables. After that, Akaike Information Criterion (AIC) is used to select the optimal lag length of variables. To estimate short-run coefficients, the proposed Error Correction Model is given below

$$\Delta L(FDI_t) = \beta_1 + \beta_{2i} \sum_{i=0}^{m} \Delta L(COR_{t-i}) + \beta_{3i} \sum_{i=0}^{m} \Delta L(GDP_{t-i}) + \beta_{4i} \sum_{i=0}^{m} \Delta L(OP_{t-i}) + \beta_{5i} \sum_{i=0}^{m} \Delta L(DMA_{t-i}) + \lambda ECT_{t-1} + \varepsilon_t$$

…….. (4)

λ is the speed of adjustment; it represents the speed at which the long-run disequilibrium of the previous year is corrected in the current year. The ECT must be negative and statistically significant.

7. Empirical Results

Unit Root Test

It is mentioned earlier that the ARDL approach relies on the order of integration of the variables. Unit root test is necessary to confirm that none of the variables is stationary at I (2). For this, we use the Augmented Dickey-Fuller method to check the stationarity of the variable, and the result is given in the below table:

Table 4: Unit Root Test Result

Variables	Level		1st Difference		Order of Integration
	Constant and No Trend	Constant and Trend	Constant and No Trend	Constant and Trend	
L (FDI)	-3.5251	-2.5812	-4.8286	-4.7621	I (0)
L (COR)	-1.3325	-2.2104	-3.7340	-3.7143	I (1)
L (GDP)	-2.3051	-4.8336	-4.9348	-4.6756	I (1)
L (OP)	-1.2730	-3.7232	-4.8535	-4.8545	I (1)
L (DMA)	-1.5363	-1.5712	-4.8034	-4.0057	I (1)

Table 3 shows that except L (FDI), all four variables are stationary at 1st difference. Now we can go for ARDL bound test approach.

Bounds Test for Cointegration: Table 3 shows the ARDL bounds cointegration test result. The result reveals that the computed F-statistics is 6.1705 higher than the upper bound at 1%, 5% and 10% critical values.

Table 5: ARDL Bounds test result

Lag	Significance Level	Pesaran et al. (2001)		F-Statistics
		Lower Bounds	Upper Bounds	
2	10%	2.45	3.52	6.170
	5%	2.86	4.01	
	1%	3.74	5.06	

The result from the table confirms to rejection of the null hypothesis. So, it can be concluded from the ARDL bounds test result that there is long-run cointegration among variables.

We used Akaike Information Criterion (AIC) to select the optimal lag length of selected variables annexed in the ARDL model.

Table 6: Estimated Long-run Coefficients of ARDL (1,2,0,2,0) Model

Variables	Coefficient	Standard Error	Prob.
Constant	-1.5656	0.2949	0.0000
L (COR)	-0.2861	0.10652	0.0146
L (GDP)	0.08914	0.04933	0.0549
L (OP)	0.07528	0.00999	0.0000
L (DMA)	0.07403	0.06173	0.2451

The above table shows the estimated long-run coefficient. According to the result, corruption is statistically significant and negatively affects Bangladesh's FDI inflows in the long run. The coefficient of corruption is -0.28610, which indicates that a 1% increase in corruption declines FDI inflows by 28.61%, which is too large.

The coefficient value of GDP growth is 0.08914, meaning that a 1% increase in GDP growth increases FDI inflows by 8.9%, which is significant at a 10% significance level.

The coefficient value of trade openness is 0.0752, meaning that a 1% increase in trade openness increases FDI inflows by 7.5% and is statistically significant at a 1% significance level.

Democratic accountability is positively correlated with FDI inflows but statistically insignificant.

Table 7: Results of Error Correction Model

Variable	Coefficient	Standard Error	Prob.
ΔL (COR)	0.14356	0.15035	0.0351
ΔL (GDP)	0.00963	0.05216	0.8555
ΔL (OP)	0.03214	0.01507	0.0463
ΔL (DMA)	0.07797	0.06476	0.2434
ECT (-1)	-1.0532	0.18675	0.0000

(R^2=0.9103, Adj. R^2 = 0.8678, DW= 1.82, F-statistic = 21.429 (Prob.= 0.0000)

The result reveals that in the short-run, none of the variables is significant except trade openness. The coefficient value of trade openness is 0.03214, which means a 1% increase in the trade openness in the short-run increases FDI inflows by 3%. ECT value indicates the speed of adjustment of the correction of disequilibrium. The coefficient of ECT is negative and statistically significant, implying no bias regarding omitting important variables and that a long-run relationship exists between dependent and independent variables. From the table, we can see that ECT is -1.0532 and statistically significant, implying that the speed of adjustment to the correction of last year's disequilibrium to reach long-run equilibrium is 105%.

Long-run Robust Testing: We use Dynamic Least Square (DOLS) to check the robustness of long-run results. The results support our ARDL long-run findings. The result of DOLS is given below:

Table 8: Results of Dynamic Least Square (DOLS)

Variable	Coefficient	Standard Error	Prob.
L (COR)	-0.36701	0.153360	0.0353
L (GDP)	0.07752	0.130961	0.065
L (OP)	0.08272	0.017381	0.0006
L (DMA)	0.051029	0.08242	0.5485
Constant	-1.5396	0.38863	0.0022

The results of DOLS are similar to the ARDL long-run estimation. Corruption has a negative and significant impact on FDI inflows. Still, trade openness has also a positive and significant impact on FDI inflows in the long run. GDP growth positively influences FDI inflows at a 10% significance level. Democratic accountability is not significant in the long –run.

Table 9: Diagnostic Tests Results

Test Statistic	Probability Value
Serial Correlation	0.7097
Normality	0.8153
Heteroscedasticity	0.4556

The results of diagnostic tests show no problem with serial correlation, heteroscedasticity, and residuals following the normality as all the p-values of the tests are more than 5%, so we can reject the null hypotheses**.**

Stability Test

Figure 2: CUSUM Test

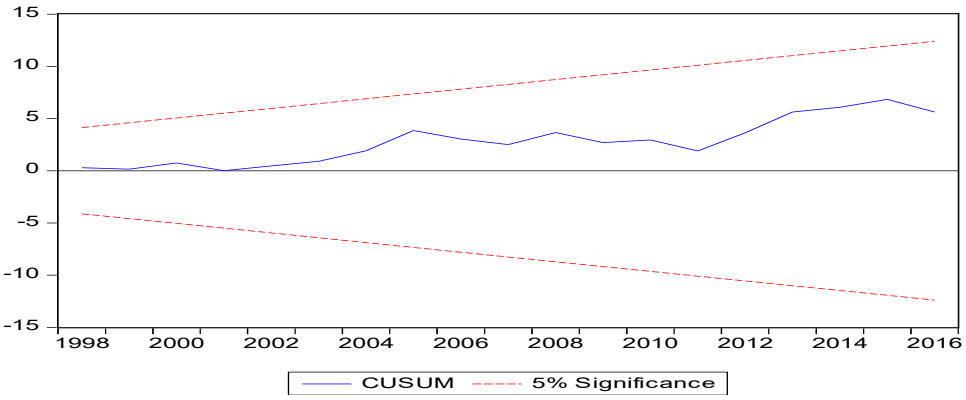
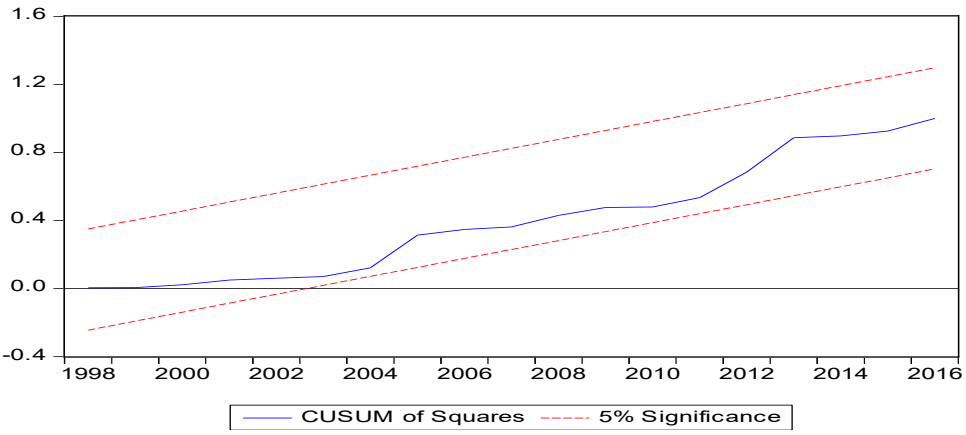


Figure 3: CUSUMSQ Test



The above figures show that CUSUM and CUSUMSQ are within the critical 5% bound and confirm the stability of the coefficients.

8. Conclusion and Recommendations

The main finding of this research is that corruption and trade openness affect the attraction of FDI inflows in Bangladesh. Corruption negatively and significantly influences the FDI inflows, and trade openness positively and significantly impacts the FDI inflows in Bangladesh. The positive and significant results of trade openness indicate that over the last three decades, policies, incentives and initiatives regarding trade openness have contributed much towards creating investment and a business-friendly environment; in this way, it is capturing more FDI inflows in Bangladesh. Regarding the significant and negative results of corruption, it can be stated that there is a lack of transparency and accountability

and rampant corruption in the tax and customs sectors which make the vulnerable situation for foreign investors.

The weak significance of GDP growth indicates that GDP growth has a lesser impact on FDI inflows which is not surprising. It can happen due to the composition of the equation, which influences both the significance and direction of the relationship between FDI inflows and selected variables, and it may be due to data constraints. However, we need to make sensible macroeconomic policies to boost economic growth and increase the GDP growth, contributing to attracting FDI inflows.

In the light of the findings, this study suggests that Bangladesh needs to take effective action to control corruption and take proper steps to check and balance the unwanted factors. It will undoubtedly help enhance foreign investment and strengthen the economic growth of Bangladesh, and the dream of being a developed economy will be fulfilled in 100 years.

9. Contributions

As far as my little knowledge goes, very few studies provide such analysis regarding the level of corruption and its impact on FDI. This report can help the government of Bangladesh to understand the loopholes of corruption which may deter the smooth FDI inflows in the country and take corrective actions against corruption. This report can provide the Anti-Corruption Commission Bangladesh with valuable data, which is essential to establish a stable economic condition for the country by stabilising FDI inflows in Bangladesh. This report can also help the trade and Commerce Ministry of the country as a tool to liberalise the country's trade to attract more FDI inflows. This report will also work as a ground for future analysis of a country's foreign direct investment inflows and give insight to the future research.

10. Limitations

The present study empirically analyses the impact of corruption, trade openness, GDP growth rate and democratic accountability on FDI inflows. However, it seems complicated to deny that the current study has certain limitations. Firstly, due to the non-availability of corruption and democratic accountability data from ICRG, we cannot analyse the data after 2016. Secondly, the study is based on secondary sources, so the data's reliability cannot be confirmed.

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Appendices

Unit Root Test:

1. Cor:

Level:

Intercept without trend:

Null Hypothesis: COR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.332583	0.6012
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

**MacKinnon (1996) one-sided p-values.*

Intercept with the trend:

Null Hypothesis: COR has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.210433	0.4665
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

**MacKinnon (1996) one-sided p-values.*

1st difference:

Intercept without trend:

Null Hypothesis: D (COR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.734021	0.0088
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

**MacKinnon (1996) one-sided p-values.*

Intercept with the trend:

Null Hypothesis: D (COR) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.714371	0.0374
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

**MacKinnon (1996) one-sided p-values.*

2. DMA:

Level:

Intercept without trend:

Null Hypothesis: DMA has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.536374	0.5018
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

Intercept with the trend:

Null Hypothesis: DMA has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.571271	0.7804
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

**MacKinnon (1996) one-sided p-values.*

1st difference:

Intercept without trend:

Null Hypothesis: D (DMA) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.083432	0.0037
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

**MacKinnon (1996) one-sided p-values.*

intercept with the trend:

Null Hypothesis: D (DMA) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.005785	0.0199
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

**MacKinnon (1996) one-sided p-values.*

3. FDI:
Level:
Intercept without trend:

Null Hypothesis: FDI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.525150	0.0174
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

**MacKinnon (1996) one-sided p-values.*

Intercept with the trend:
Null Hypothesis: FDI has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.581280	0.0487
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

**MacKinnon (1996) one-sided p-values.*

1st difference:
Intercept without trend:
Null Hypothesis: D (FDI) has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.828600	0.0007
Test critical values:	1% level	-3.711457	
	5% level	-2.981038	
	10% level	-2.629906	

**MacKinnon (1996) one-sided p-values.*

Intercept with trend
Null Hypothesis: D (FDI) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 3 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.762183	0.0040
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

**MacKinnon (1996) one-sided p-values.*

4. GDP growth
Level:
Intercept without trend:

Null Hypothesis: GDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.305194	0.1769
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

**MacKinnon (1996) one-sided p-values.*

Intercept with the trend:

Null Hypothesis: GDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.833664	0.0028
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

**MacKinnon (1996) one-sided p-values.*

1st difference:
Intercept without trend:

Null Hypothesis: D (GDP) has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.934854	0.0005
Test critical values:	1% level	-3.711457	
	5% level	-2.981038	
	10% level	-2.629906	

**MacKinnon (1996) one-sided p-values.*

Intercept with the trend:

Null Hypothesis: D (GDP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 3 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.675653	0.0049
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

5. OP:
Level:
Intercept without trend:
Null Hypothesis: OP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.273029	0.6287
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

**MacKinnon (1996) one-sided p-values.*

intercept with the trend:
Null Hypothesis: OP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 7 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.723281	0.0411
Test critical values:	1% level	-4.416345	
	5% level	-3.622033	
	10% level	-3.248592	

**MacKinnon (1996) one-sided p-values.*

1st difference:
Intercept without trend:
Null Hypothesis: D (OP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.853550	0.0005
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

**MacKinnon (1996) one-sided p-values.*
intercept with the trend:
Null Hypothesis: D (OP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.854543	0.0028
Test critical values:	1% level	-4.309824	
	5% level	-3.574244	
	10% level	-3.221728	

**MacKinnon (1996) one-sided p-values.*

Optimal Lag:
VAR Lag Order Selection Criteria
Endogenous variables: FDI COR OP GDP DMA
Exogenous variables: C
Date: 03/12/20 Time: 09:42
Sample: 1986, 2016
Included observations: 29

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-192.5936	NA	0.570010	13.62715	13.86289	13.70098
1	-101.4585	144.5592*	0.006140*	9.066101*	10.48055*	9.509088*
2	-85.36765	19.97481	0.013441	9.680528	12.27367	10.49267

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

ARDL

Dependent Variable: FDI
Method: ARDL
Date: 02/21/20 Time: 22:47
Sample (adjusted): 1988, 2016
Included observations: 29 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): COR GDP OP DMA
Fixed regressors: C
Number of models evaluated: 162
Selected Model: ARDL (1, 2, 0, 2, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
FDI (-1)	-0.053260	0.186752	-0.285192	0.7786
COR	0.143563	0.150351	0.954852	0.3516
COR (-1)	-0.201271	0.227050	-0.886460	0.3865
COR (-2)	-0.243636	0.174743	-1.394252	0.1793
GDP	0.009633	0.052167	0.184659	0.8555
OP	0.032143	0.015077	2.131839	0.0463
OP (-1)	-0.003964	0.018737	-0.211561	0.8347
OP (-2)	0.051120	0.016251	3.145673	0.0053
DMA	0.077974	0.064765	1.203961	0.2434
C	-1.649083	0.409241	-4.029611	0.0007
R-squared	0.910322	Mean dependent var		0.575876
Adjusted R-squared	0.867843	S.D. dependent var		0.547858
SE of regression	0.199165	Akaike info criterion		-0.122570
Sum squared resid	0.753665	Schwarz criterion		0.348911
Log-likelihood	11.77727	Hannan-Quinn criter.		0.025092
F-statistic	21.42994	Durbin-Watson stat		1.816706
Prob (F-statistic)	0.000000			

***Note:** p-values and any subsequent tests do not account for model

Bound test

ARDL Bounds Test

Date: 02/21/20 Time: 22:47
Sample: 1988, 2016
Included observations: 29
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	6.170588	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Long-run and short-run relationship

ARDL Cointegrating And Long Run Form
Dependent Variable: FDI
Selected Model: ARDL (1, 2, 0, 2, 0)
Date: 02/21/20 Time: 22:48
Sample: 1986, 2016
Included observations: 29

Cointegrating Form

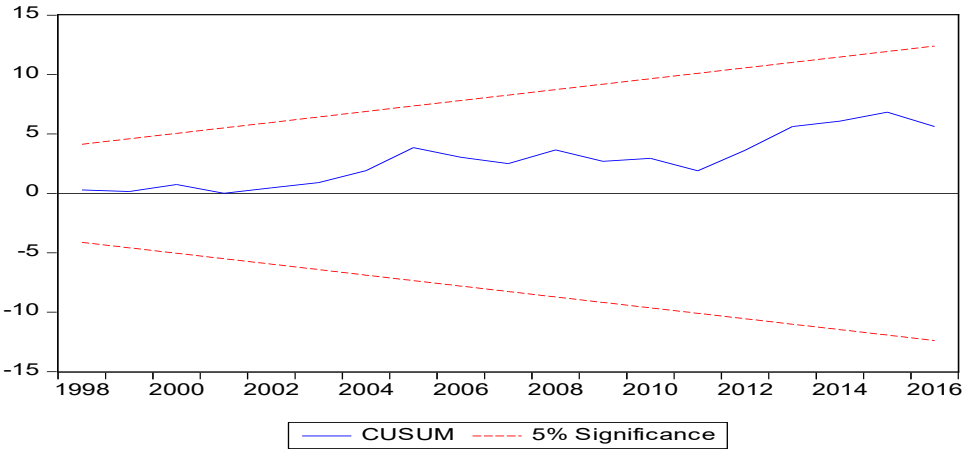
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D (COR)	0.143563	0.150351	0.954852	0.3516
D (COR (-1))	0.243636	0.174743	1.394252	0.1793
D (GDP)	0.009633	0.052167	0.184659	0.8555
D (OP)	0.032143	0.015077	2.131839	0.0463
D (OP (-1))	-0.051120	0.016251	-3.145673	0.0053
D (DMA)	0.077974	0.064765	1.203961	0.2434
CointEq (-1)	-1.053260	0.186752	-5.639885	0.0000

Cointeq = FDI - (-0.2861*COR + 0.0091*GDP + 0.0753*OP + 0.0740*DMA -1.5657)

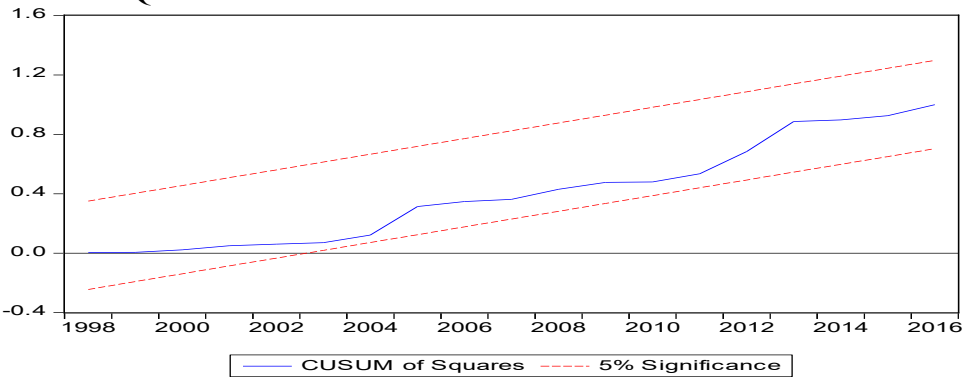
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
COR	-0.286106	0.106527	-2.685750	0.0146
GDP	0.089146	0.049325	0.185422	0.0549
OP	0.075289	0.009993	7.534133	0.0000
DMA	0.074031	0.061727	1.199340	0.2451
C	-1.565694	0.294947	-5.308395	0.0000

Diagnostic test

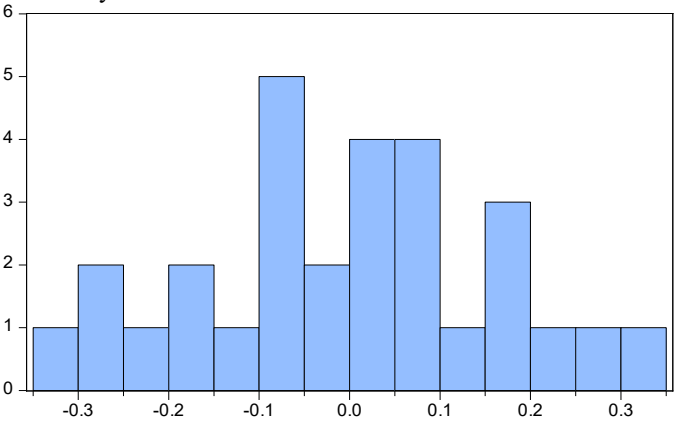
Stability Test
CUSUM Test



CUSUM SQUARE Test



Normality test



Series: Residuals	
Sample 1988 2016	
Observations 29	
Mean	-2.34e-16
Median	0.014303
Maximum	0.308994
Minimum	-0.318137
Std. Dev.	0.164063
Skewness	-0.113560
Kurtosis	2.464814
Jarque-Bera	0.408425
Probability	0.815289

Serial correlation

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.205882	Prob. F (2,17)	0.8159
Obs*R-squared	0.685809	Prob. Chi-Square (2)	0.7097

Heteroscedasticity

Heteroscedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.920213	Prob. F (9,19)	0.5291
Obs*R-squared	8.803473	Prob. Chi-Square (9)	0.4556
Scaled explained SS	2.767692	Prob. Chi-Square (9)	0.9728

Robustness checking for long-run Evidence

DOLS

Dependent Variable: FDI

Method: Dynamic Least Squares (DOLS)

Date: 02/22/20 Time: 01:24

Sample (adjusted): 1988, 2015

Included observations: 28 after adjustments

Cointegrating equation deterministic: C

Fixed leads and lags specification (lead=1, lag=1)

Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COR	-0.367810	0.153360	-2.398341	0.0353
DMA	0.051029	0.082426	0.619090	0.5485
GDP	0.077555	0.130967	0.057685	0.0650
OP	0.082728	0.017381	4.759834	0.0006
C	-1.539611	0.388638	-3.961558	0.0022
R-squared	0.927137	Mean dependent var		0.565663
Adjusted R-squared	0.821154	S.D. dependent var		0.555092
SE of regression	0.234749	Sum squared resid		0.606180
Long-run variance	0.033187			