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The Role of Foreign Direct Investment (FDI) Inflows on Export Performance in Developing Economies: Evidence from Bangladesh

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

Considering the importance of FDI inflows to enhance the export performance in the developing economies, this study aims to investigate the relationship between FDI inflows and export performance in Bangladesh using annual time series data for the period of 1995 to 2020. The empirical analysis is performed employing Johansen cointegration approach and Vector Error Correction Mechanism (VECM) in order to find out the long run as well as the short run relationship between FDI inflows and export receipts. The results of the study indicate that the export receipts have statistically significant positive relationship with FDI inflows in the long run. While other important variables, namely import payments, exchange rate and government development expenditure also have statistically significant influences on the export receipts, moreover the right direction of the all of these variables shows that to some extent there have been an insightful economic relationship between the variables. However, in the short run, such a relationship between FDI inflows and export performance is not statistically well justified, as the inappropriate sign of the coefficient of the error correction term indicates that the dynamic adjustment to the long

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run equilibrium has not been found in a consistent statistical manner. Lastly, this study also recommends that the government should initiate proper steps for the infrastructure development in the export oriented industrial sector to attract higher FDI inflows in accelerating the export performance that would ensure the faster economic development of the country as a whole.

Keywords: FDI inflows; export performance; cointegration; VECM; Bangladesh.

JEL Classification: C22, F10 and F20.

1. INTRODUCTION

Since from the late twentieth century, the Foreign Direct Investment (FDI) into developing countries has been sharply increased and at the same time the contribution to world export from the developing countries has also been increased remarkably. During that period most of the developing countries across the world have been experiencing the export driven economic growth in their respective economies. It has already been recognized that FDI is considered as one of the important factors in accelerating the development process of the developing economy across the world. In this era of globalization, transferring technology, capital mobility and exchanging human capital have become the vital part of enhancing the economic development so that FDI can play a crucial role in achieving such a development along with proper economic integration. As the developing country around the globe have been enjoyed export oriented economic development, thus FDI has substantial influence to foster the export performance in those countries. It is essential to investigate the impact of FDI on the export performance in the developing economies.

1.1 Background Information

Bangladesh is an emerging state in South Asia; the country has recently entered into the process of developing country. Since the late 1980s, Bangladesh has entered the world market in exporting ready-made garments (RMGs). The major portion of the country's foreign currency earnings has been accumulated from the RMG exports. Relying on the RMG export and manpower export, the country has started to enhance the export led economic development from the later part of the previous century. While the country needs a huge investment for supporting the export-oriented industries thus FDI can act as a vital source of investment in order to enhance this development process. FDI basically facilitates the export industries of the economy by providing required capitals along

with adopting the latest technology, advanced operational capability, creating larger employment opportunity and improving infrastructure. FDI has a merit to promote higher growth by facilitating the export-oriented industries in any economy especially in the developing one. The country's socio-economic condition, political stability and economic environment are often treated as the crucial factors to attract FDI. The FDI inflows can be treated as the major influential factor as the source of prerequisite investment to increase the export performance of Bangladesh. Considering the importance of FDI in fostering the export performance in the developing country, it has been a modest motivation to conduct a study that will explore the relationship between Export performance and FDI inflows in Bangladesh.

The diagram presented in Figs. 1 and 2 (see appendix) show annual FDI inflows and export receipts volume in Bangladesh over the period from 1995 to 2020. These figures depict the increasing and similar patterns of trend in export receipts and FDI inflows over the observed period in the economy. Therefore, it can be realized that there might have been the long run as well as short run linkage between export receipts and FDI inflows in Bangladesh.

1.2 Objective of the Study

In fact, FDI can play a crucial role in accelerating the country's economic development by enhancing the country's overall export performance. The present study aims to investigate the export performance and FDI inflows relationship in Bangladesh. The empirical research of this study has been carried out considering the following research objective:

To investigate the impact of FDI inflows on the export performance in Bangladesh.

The organizations of this paper are as follows. Section 2 includes literature review, section 3 presents data, variables and methodology,

section 4 discusses the empirical findings, and finally, section 5 incorporates the conclusion and policy implication.

2. LITERATURE REVIEW

The following studies have been reviewed in order to understand the FDI inflows and export performance relationship in developing countries around the world.

Majeed and Ahmad [1] analyzed the relationship between FDI and exports in the 49 developing countries using panel data for 1970 to 2004. The results found that FDI and exports are positively related with each other and the evidence of this study does not support any substitutional effect between FDI and exports.

Adhikary [2] explored the effect of FDI and some other relevant factors on exports in Bangladesh for the period 1980 to 2009. The results found to be significant by the FDI in order to explain the exports changes.

Goswami and Saikia [3] investigated the relationship between FDI and manufactured exports using yearly time series data from 1991-92 to 2010-11 in India. The result of the study revealed that there exists bi-directional causality between FDI and exports.

Hussain and Haque [4] investigated the FDI, trade and economic growth relationship in Bangladesh and found the existence of significance relationship between the mentioned variables.

Mahmoodi and Mahmoodi [5] analyzed the causal relationship between FDI, exports and economic growth in developing countries using the two panels comprised eight European developing countries and eight Asian developing countries. The empirical evidence shows that the short run and long run causal relationship among the variables have been implied in case of both panels.

Mitic and Evic [6] conducted research to identify the impact of FDI on exports in the eleven transition countries in Europe. The results of the study identify that there exists a significant level of correlation between FDI and exports while stronger relationship has been found between FDI and high-tech exports.

Mukhtarov et al. [7] explored the influence of FDI on exports in Jordan for the period of 1980 to

2018. The empirical evidence from the study indicates that FDI has significant positive impact on exports in the long run.

Huyen [8] examined the relationship between FDI, exports, foreign aid and economic growth in Vietnam over the period 1997 to 2018. The results of the study show the highly significant positive relationship among the mentioned variables.

Jana et al. [9] studied the importance of FDI to the foreign trade in India. The evidence from this study suggests that there is a unidirectional long run causality from foreign trade to FDI while in the short run, there is a bi-directional causality between these two factors.

Nguyen et al. [10] studied to find out the causal relationship between FDI, exports and economic growth during 1999 to 2019 in a particular province of Vietnam. The findings of the analysis postulate that the FDI and exports have the positive influences on regional GDP.

After comprehensively reviewing the different studies that analyzed the FDI-exports relationship in the developing countries, including Bangladesh, it is required to explore the issue of the relationship between FDI and export performance including other important determinants of exports in Bangladesh using the recent past data employing advanced econometric approach.

3. METHODOLOGY

This study has been utilized the annual time series data for the period of 1995 to 2020 in empirical analysis. The secondary data for this study have been collected from Bangladesh Bank (BB), Bangladesh Bureau of Statistics (BBS) including international organization like the World Bank. This paper will conduct the research to explore the short run and long run relationships between FDI and export performance in Bangladesh using a modern time series co-integration technique, including Vector Error Correction (VEC) method considering annual time series data from 1995 to 2020.

As this study has been carried out using historical time series data, the time series variables are often non-stationary in nature, that means such variables are not stationary, $I(0)$ but their first difference could be belonged to stationary, i.e., first order integration, $I(1)$. When

the variables under study shows the first order integration then the variables could have long run cointegrating relationships. The linear combination of the variables or the cointegrating relationship of these variables would be stationary, i.e., integrated at the level, $I(0)$. Such kinds of cointegrating relationships or long run relationships are examined by applying Johansen Approach. In the long run relationship, the Granger causality test is employed to understand the short run causal relationships among variables. The long run causal relationship is identified utilizing Vector Error Correction (VEC) method, whether the dynamic adjustments among variables in the short run towards the long run equilibrium relationship has been established at a consistent statistical phenomenon or not.

The model has been used in the empirical relationship by the following theoretical expression.

$$LEXP = f(LFDII, LIMP, EXR, LGDE) \quad (1)$$

Where,

LEXP = Natural log of export receipts

LFDII = Natural log of foreign direct investment inflows

LIMP = Natural log of import payments

EXR = Exchange Rate (BDT/US\$)

LGDE = Natural log of government development expenditure

To investigate the relationship between FDI inflows and export performance, other important determinants of exports like import receipts, exchange rate and government development expenditure have also been included in the empirical expression. Since, most of the intermediate goods or raw materials for export industries are to import from abroad that is why imports might be considered as the one of the valuable determinants of exports. The exchange rate has been recognized as the crucial factors in determining the exports across the world. In many developing countries, government has to provide the facilities in infrastructures development including other logistic supports at the export-oriented industries that can foster the export growth rapidly. As Bangladesh is not different from it, thus government development expenditure has been considered as the proxy of government provided infrastructure facility to the export industries that is also treated as the major determinants of export in Bangladesh.

The empirical model that has been specified for the analysis of this study can be written in the following form.

$$LEXP_t = \pi_0 + \pi_1 LFDII_t + \pi_2 LIMP_t + \pi_3 EXR_t + \pi_4 LGDE_t + \varepsilon_t \quad (2)$$

Since, the rationale of this study is to examine the relationship between FDI inflows and Export performance in Bangladesh, in order to do so, this study adopts the cointegration test, Granger causality test, and multivariate Vector Error Correction Model to test relations between the variables. After setting up the order of integration to check whether each data series has a unit root, the cointegration hypothesis between the variables is examined by using the Johansen cointegration approach [11] in order to identify the long run relationship between the variables. Granger causality test introduced and developed by Granger [12-14] is applied in this study to determine whether the lagged values of one variable affect another. More precisely the multivariate Vector Error Correction Model (VECM) suggested by Engert and Hendry [15] is incorporated in the analysis to investigate the short run relationship with the speed of adjustment between study variables in Bangladesh.

4. RESULTS AND DISCUSSION

This section of the paper includes the descriptive statistics, unit root test, cointegration test, Granger causality test and VECM, and then discussion of these findings.

The Table 1 shows the descriptive statistics of the study and it depicts that all the study variables follow the normal distribution as the probability of the Jarque-Bera test accepts the hypothesis of the observations come from the normal distribution.

In fact, all the time series variables exhibit first order of integration that represented in the Table 2, which means all of these variables are non-stationary at their level and stationary at first difference, i.e., $I(1)$. Thus, these variables may be cointegrated and long run relationships may exist between variables. In order to examine the long run equilibrium relationships, the cointegration analysis is employed using the Johansen cointegration approach. The Johansen cointegration approach is to identify the appropriate number of cointegrating equations using two popular methods, namely the trace statistic test and the maximum eigenvalue test.

Table 1. Descriptive statistics

	LEXP	LFDII	LIMP	EXR	LGDE
Mean	9.45	6.68	9.82	64.84	7.89
Median	9.48	6.66	9.86	68.70	7.57
Maximum	10.60	8.26	10.93	84.78	9.49
Minimum	8.15	4.90	8.67	40.00	5.32
Std. Dev.	0.81	0.85	0.75	14.44	0.90
Skewness	-0.03	-0.10	-0.01	-0.26	-0.22
Kurtosis	1.51	2.32	1.45	1.70	3.98
Jarque-Bera	2.39	0.54	2.57	2.13	1.27
Probability	0.3017	0.7613	0.2759	0.3437	0.5299
Observations	26	26	26	26	26

Source: Author's calculation by using the E-Views 10 Software

Table 2. Unit root test results

Augmented Dickey-Fuller (ADF) Test		
Variables	Level	1st Difference
LEXP	Non-stationary	Stationary ^{***}
LFDII	Non-stationary	Stationary ^{***}
LIMP	Non-stationary	Stationary ^{***}
EXR	Non-stationary	Stationary ^{***}
LGDE	Non-stationary	Stationary ^{***}
Phillips-Perron (PP) Test		
Variables	Level	1st Difference
LEXP	Non-stationary	Stationary ^{***}
LFDII	Non-stationary	Stationary ^{***}
LIMP	Non-stationary	Stationary ^{***}
EXR	Non-stationary	Stationary ^{***}
LGDE	Non-stationary	Stationary ^{***}

Source: Author's calculation by using the E-Views 10 Software

Note: ^{***} means significant at 1% level

Table 3. Cointegration rank test results

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.681275	72.69637	69.81889	0.0289
At most 1	0.612581	45.25410	47.85613	0.0860
At most 2	0.384040	22.49613	29.79707	0.2717
At most 3	0.244347	10.86635	15.49471	0.2198
At most 4 *	0.158519	4.142202	3.841466	0.0418
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.681275	27.44226	33.87687	0.2404
At most 1	0.612581	22.75798	27.58434	0.1840
At most 2	0.384040	11.62977	21.13162	0.5845
At most 3	0.244347	6.724152	14.26460	0.5223
At most 4 *	0.158519	4.142202	3.841466	0.0418

Source: Author's calculation by using the E-Views 10 Software

Notes: 1. * denotes rejection of the hypothesis at the 0.05 level

2. **MacKinnon-Haug-Michelis (1999) p-values

In the Table 3, the results of the trace test confirm that 1 cointegrating equation exists in the long run relationship. The number of cointegrating vectors using the above-stated tests in Johansen’s approach reveals the existence of one cointegrating vector in variables. Therefore, it suggests the long run relationship between variables. The following table shows the normalized coefficients of the cointegrating equation.

Therefore, the long run relationship can be written as,

$$LEXP_t = -1.3561 + 0.5659LFDII_t + 0.4986LIMP_t + 0.0114EXR_t - 0.1716LGDE_t + \varepsilon_t \quad (3)$$

The estimation of the long run relationship depicts that there have been highly statistically significant association between FDI inflows and export performance. The empirical result reveals that the coefficients of the FDI inflows, import payments, exchange rate and government development expenditure are found to be statistically significant and except the coefficient of government development expenditure, the coefficients of all other variables have taken the expected sign which indicated the right direction in the empirical relationship. So, it can be stated that in the long run, a 1% increase in FDI inflows growth is associated with a 0.57% increase in the export receipts growth, a 1% increase in import payments growth is associated with a 0.50% increase in the export receipts growth, a 1-unit increase in exchange rate is associated with a 1% increase in the export receipts growth, and a 1% increase in government development expenditure growth is associated with a 0.17% decrease in the export receipts growth.

After establishing the cointegrating relations using Johansen’s approach, this study applies the Granger causality test to determine whether the lagged values of one variable affect another variable or not. The following part discusses the results of the Granger causality test in order to examine the causal relationship between study variables.

The results of the Granger causality test incorporated in Table 5 show that the unidirectional granger causality runs from export receipts growth to FDI inflows growth, exchange rate to export receipts growth, export receipts growth to government development expenditure growth, import payments growth to FDI inflows growth, exchange rate to FDI inflows growth, exchange rate to import payments growth, exchange rate to government development expenditure growth, and import payments growth to government development expenditure growth. Conversely, the two-way causality is running between FDI inflows growth and government development expenditure growth.

After examining the long run relationships between export receipts, FDI inflows, import payments, exchange rate and government development expenditure using the Johansen cointegration approach, this study would perform the estimation of short run dynamic adjustment by which the disequilibrium in the short run converges towards long run equilibrium relationship. Table 6 presents the estimates of the VEC model with respective standard errors and t values of the coefficients. The VEC model estimation usually includes the cointegrating equation term (or error correction term (ECT)) for adjusting deviation from the long run through a series of partial adjustments over time. The negative and statistically significant coefficient of the ECT reflects that the economy converges towards the equilibrium point by short run adjustment.

Since the VEC estimates illustrated in Table 6, none of the coefficients of ECT have shown statistically significant results and excepts the coefficient of the ECT in government development expenditure growth, all other equations have not taken the negative sign in the coefficients of the ECT. The speed of adjustment process towards long run equilibrium from the disequilibrium in the short run is not statistically well justified that means the convergence process towards the equilibrium point through the short run adjustments have not taken place in a consistent statistical manner.

Table 4. Normalized cointegrating coefficients result

LEXP	LFDII	LIMP	EXR	LGDE	C
1.000000	-0.565970*** (0.02969) [-19.0631]	-0.498648*** (0.04563) [-10.9273]	-0.011480*** (0.00202) [-5.69042]	0.171622*** (0.01436) [11.9504]	-1.356152

Source: Author’s calculation by using the E-Views 10 Software.

Note: *** indicates the 1% level of significance respectively and Standard errors in () & t-statistics in []

Table 5. Results of the Granger causality test

Null Hypothesis	Obs	F-Statistic	Prob.
LFDII does not Granger Cause LEXP	25	2.20518	0.1517
LEXP does not Granger Cause LFDII		14.6665***	0.0009
LIMP does not Granger Cause LEXP	25	0.42997	0.5188
LEXP does not Granger Cause LIMP		1.18157	0.2888
EXR does not Granger Cause LEXP	25	3.17165*	0.0887
LEXP does not Granger Cause EXR		2.04721	0.1665
LGDE does not Granger Cause LEXP	25	0.26831	0.6096
LEXP does not Granger Cause LGDE		10.7982***	0.0034
LIMP does not Granger Cause LFDII	25	15.6494***	0.0007
LFDII does not Granger Cause LIMP		0.78670	0.3847
EXR does not Granger Cause LFDII	25	6.63915**	0.0172
LFDII does not Granger Cause EXR		0.73226	0.4014
LGDE does not Granger Cause LFDII	25	7.82286**	0.0105
LFDII does not Granger Cause LGDE		8.63063***	0.0076
EXR does not Granger Cause LIMP	25	3.76230*	0.0653
LIMP does not Granger Cause EXR		2.87141	0.1043
LGDE does not Granger Cause LIMP	25	0.70428	0.4104
LIMP does not Granger Cause LGDE		11.0686***	0.0031
LGDE does not Granger Cause EXR	25	0.00508	0.9438
EXR does not Granger Cause LGDE		6.44866**	0.0187

Source: Author's calculation by using the E-Views 10 Software

Note: Note: ***, ** and * indicate the 1%, 5% and 10% level of significance, respectively

Table 6. The VEC model estimation results

Vector Error Correction Estimates					
Error Correction	D(LEXP)	D(LFDII)	D(LIMP)	D(EXR)	D(LGDE)
CointEq1	0.274296	3.286455	0.156685	3.122913	-0.616202
	(0.31740)	(0.35330)	(0.32655)	(4.68940)	(1.85534)
	[0.86419]	[9.30208]	[0.47983]	[0.66595]	[-0.33212]

Source: Author's calculation by using the E-Views 10 Software

5. CONCLUSION

This study tries to find out the relationship between FDI inflows and export performance in Bangladesh. Using the annual time series data from 1995 to 2020, this study employed the Johansen cointegration approach and vector error correction technique in order to examine the long run as well as the short run relationship between FDI inflows and export performance in Bangladesh. The empirical findings from the estimated model show the significant statistical relationship between FDI inflows and export performance in the long run. While the other important factors such as imports, exchange rate, and government development expenditure have the significant statistical influences on the export performance in Bangladesh as well.

However, in terms of economic insight all of these indicators show the right economic

direction by taking the appropriate signs in the estimated coefficients that means to some extent the export performance has a remarkable association with imports, exchange rate and government development expenditure in Bangladesh. In the long run, the estimated relationship indicates the negative impact of government development expenditure growth on export receipts growth; it has also an economic implication that in Bangladesh, government development expenditure boosts up the domestic demand parallel with infrastructure developments. That is why the empirical relationship shows the government development expenditure growth has a negative impact on the export receipts growth, but the estimated effect is not that much significant level. Although there exists a long run relationship between FDI inflows and export performance, but in the short run the dynamic adjustment to the equilibrium is not statistically well justified, so that, the inappropriate sign of the coefficients of the error correction term

indicates the adjustment process has not taken place in a consistent way.

Since, the FDI inflows can play a crucial role in accelerating the export performance of the economy, the government of Bangladesh should take proper initiatives for the infrastructure development in the export oriented industrial sector in order to attract the higher FDI inflows. Enhancing the greater FDI inflows will help to foster the country's export performance and resulting the rapid economic development as well. Therefore, this study might be helpful to provide some insightful measures for policymaking process in the export led economic development by attracting greater FDI inflows that could be able to promote the export performance through attracting the higher FDI inflows in Bangladesh. In fact, Bangladesh has recently graduated from the least developed economy and entered into the process of the developing country, hence the innovative steps to attract FDI inflows could be essential for ensuring sustainable economic development through the improved export performance.

Furthermore, this study has been conducted using annual time series data, in practice utilizing annual data in empirical analysis may produce inappropriate results which might be considered as the major limitation of this study. However, it would be highly expected that the further analysis should be carried out by incorporating higher-frequency data, including more explanatory factors and advanced econometric techniques that could be useful in order to mitigate the research gap in this study.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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APPENDIX

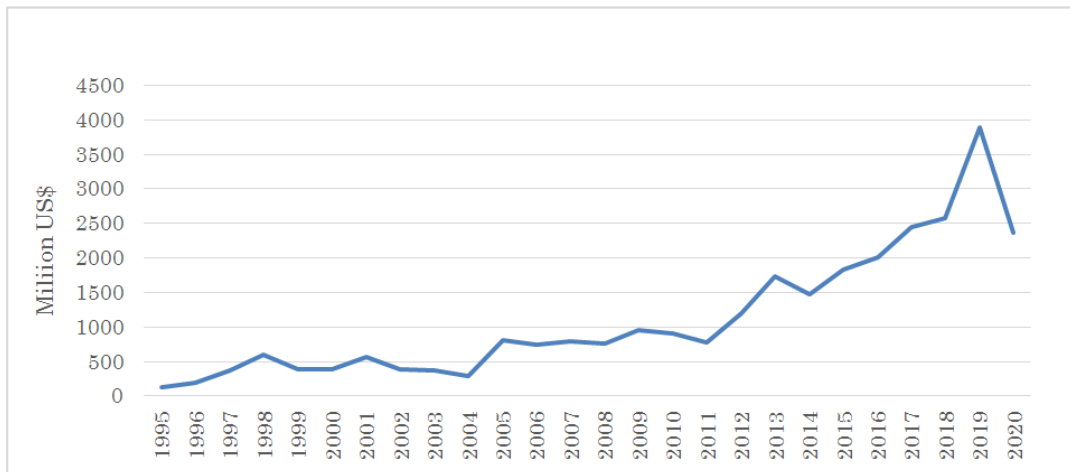


Fig. 1. Yearly FDI inflows (in million US\$) in Bangladesh

Source: Bangladesh Bank (BB)

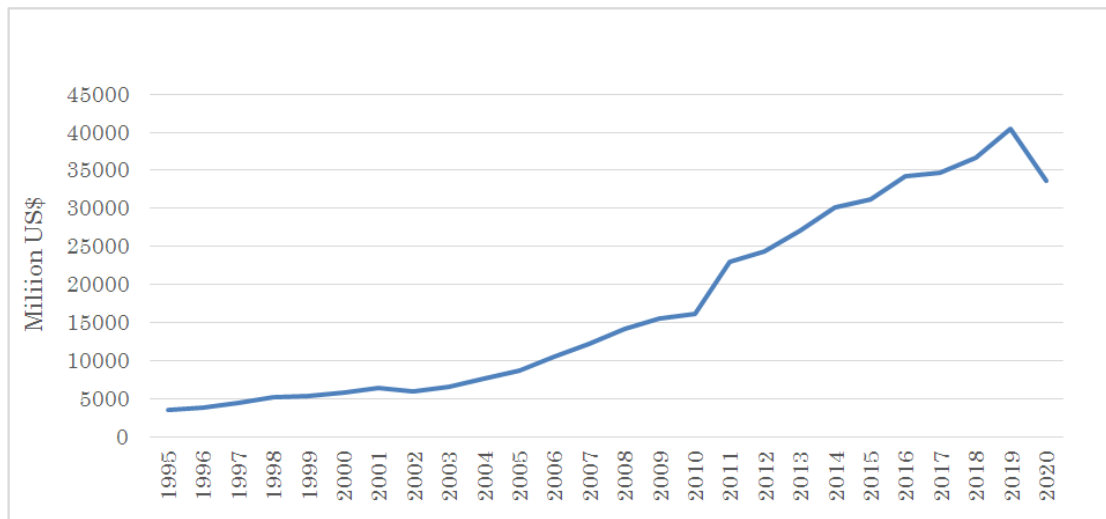


Fig. 2. Yearly export Receipts (in million US\$) in Bangladesh

Source: Export Promotion Bureau (EPB), Bangladesh

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