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Effect of Capital Inflows on Financial Development: The Case of Bangladesh

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Abstract

This study examines the effect of capital inflow components' on Bangladesh's financial development. The analysis applied the Autoregressive Distributive Lag (ARDL) model to reveal short-run and long-run associations by utilizing monthly data from January 2011 to December 2021. The study appoints two proxy variables: bank credit to GDP and bank deposit to GDP to address financial development. Findings of the analysis demonstrated that FDI and remittance inflow don't exhibit a significant relationship with financial development in the long run. However, foreign aid established a nexus with the financial progress of Bangladesh. The study recommends enacting policies to keep capital inflows under Bangladesh's financial system by repatriating foreign investors' profits and lessening remittance costs by facilitating and modernizing remittance management.

Keywords

Remittances, FDI, Financial Development, ARDL, Error Correction Method
JEL Classification Code: **C22, F24, F31, F35.**

INTRODUCTION

A well-performing financial sector is necessary for sustainable economic development. The development of the financial system provides an efficient allocation of monetary resources through shifting surplus funds to expenditure units (Ayadi, Arbak, Ben-Naceur, & Groen, 2013). Mobilization of capital under a sound financial system is necessary to ensure the availability of funds and expediting transactions. The financial sector also facilitates access to credit for the private sector and low-income borrowers. The financial sector mainly comprises the banking sector and capital market. For a developing country like Bangladesh, the contribution of the banking sector is enormous to the functioning financial system compared to the stock market, insurance and other microfinance institutions. Bangladesh's financial sector still faces numerous challenges; however, with the launching of financial sector reform in 1990, a series of actions taken to improve financial intermediation and efficient allocation of financial resources.

Acceleration of capital flows takes place by lifting barriers and reducing restrictive trade policies worldwide. The formation and nature of capital passage changed greatly which was more visible after the debt crisis at 1982 (IMF, 1999). Bank lending was a primary component of capital flows in the 1970s, where the public sector performed as the core recipient. After the 1990s, the aspect shifted to foreign direct investment, portfolio investment, remittance and inclusion of private sector external borrowing.

Following proponents, inflow of foreign capital can play an important role in mitigating the savings-investment gap, especially for developing countries lacking the required domestic resources. Mobilization of capital is associated with promoting domestic investment conditions through generating funds from outside, which will diversify investor risks and increase returns (Misra, Moday, & Murshid, 2001). According to the IMF report (2010), the highest convenience originated by capital inflow is to provide integration to the global financial system, expansion of trade opportunities and financial market developments.

A large inward flow of capital often incurs a mixture of effects. The exchange rate of the recipient country can be adversely affected through appreciation of it which will worsen the trade balance position in the long run (Acosta, Baerg, & Mandelman, 2009). Inflationary pressure can also arise by giving successive entrance to foreign capital as it commonly converts into the local currency (Calvo & Reinhart, 1996). Poorly structure of the financial market imposes a serious threat to the capital inflow-based economy by raising vulnerability and crisis position in the exchange rate market. Capital Inflow also accounted for financial instability by creating mismatches in currency maturity positions of private sectors balance sheets, thereby amplifying the asset price and lessening the quality of assets (Kawa, Lamberte, & Yang, 2008).

Foreign capital's role in incurring financial progress is still found inconclusive. The necessity of foreign capital for a developing country like Bangladesh cannot be overlooked. Apart from export earnings, external capital drives to Bangladesh mostly through foreign direct investment, remittances and overseas aid. Despite several kinds of literature focusing on FDI and remittance's effect on Bangladesh economy, their overall impact on financial perspective is not well explored. Most of the present studies concentrated on a single channel effect on the growth process where financial sector implication was mostly unobserved. The objectives of this study are mentioned below:

i. Investigate the short and long-term association between capital inflow channels and two financial development indicators. The following section provides patterns of capital inflow in Bangladesh, section 3 deals with reviews of diverse literature, and section 4 offers an empirical model set up with data sources. Section 5 illustrates the methodology, whereas the subsequent section analyses the results based on empirical estimation. The final section is destined to provide concluding remarks with necessary policy recommendations.

PATTERNS OF CAPITAL INFLOW IN BANGLADESH

As capital inflow occurs through several channels within a country, for Bangladesh, export earnings, remittances inward flow, FDI, and official aid are significant sources of the entrance of overseas capital. FDI contributes significantly to the economic progression of Bangladesh. According to the UNCTAD world investment report 2022, FDI inflow reached 2.9 billion USD. Remittances resemble a great source to earn foreign exchange for Bangladesh nowadays.

As a core supplier of migrant workers, Bangladesh secured a position in top 10 remittance recipient countries (World Bank). As illustrated in figure 1, the remittance inflow contributes more as foreign exchange earnings, exceeding the FDI and official development assistance level, especially more visible after 2004. The remittance level reached around 21 billion in 2020, whereas the FDI and ODA kept their level under 5 billion during the same period.

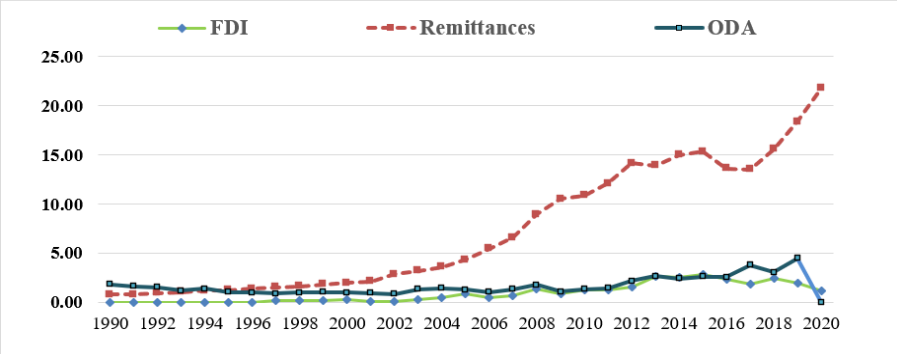

Figure 1: Major Capital Inflows to Bangladesh (USD billion, 1990-2020)
**Source: World Development Indicators (WDI)*

Figure 2 depicts remittance earner countries' position in 2020, representing India's top position (US$ 83 billion), followed by China with US$ 60 billion. Bangladesh was the 7th highest remittance recipient country, revealing US$ 22 billion in earnings.

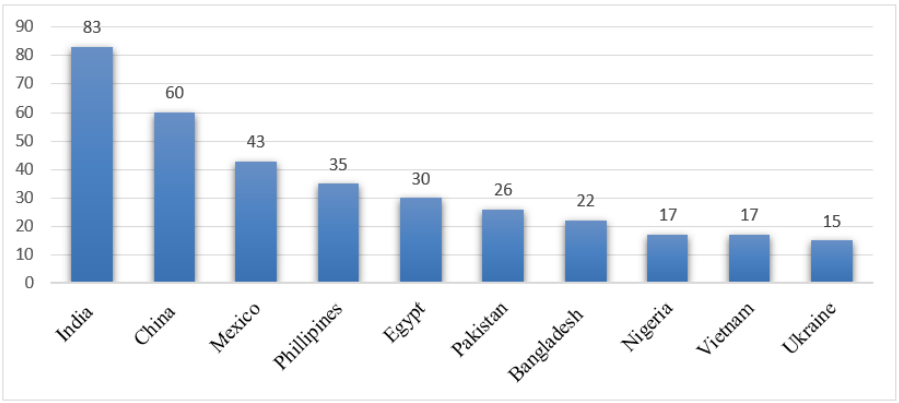

Figure 2: Top 10 Remittance Recipients among Low- and Middle-Income Countries (USD billion, 2020)
**Source: World Bank, Migration and Development Brief, May 2021.*

The FDI inflow followed an upward trend over recent years (Figure 3). The foreign direct investment regime turns as most liberal among South Asian countries regarding tax concessions and other monetary facilities. The inflow of FDI reached to highest of US$ 3888.99 million during FY 2018-19. After being halted by the Covid-19 pandemic, the inflow remained at US$ 1967.17 million in FY 2020-21.

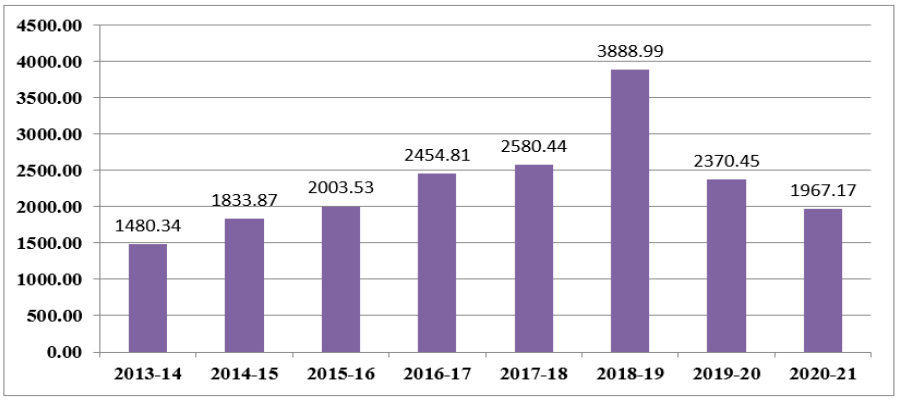

Figure 3: Trend of FDI Net Inflow in Bangladesh up to March'2021 (million USD)
**Source: Statistics Department, Bangladesh Bank & Annual Report 2020-21, BIDA.*

LITERATURE REVIEW

Existing literature provides diverse opinions on capital inflows' effect on macroeconomic indicators. In the neo-classical model, capital of advanced countries should flow towards developing countries until marginal returns of capital should match with higher investment in capital. Developed nations' capital flow would require financing the current account deficits of growing economies. However, practice over the last 30 years depicted miscellaneous results.

Adeniyi, Omisakin, Egwaikhide & Oyinlola (2012) conducted a study to examine the causal linkage between FDI and economic growth along with the financial development framework in the Gambia, Ghana, Sierra Leone, and Cote d'Ivoire for over period 1970-2000. They applied the Granger causality test, where financial development was measured by total liquid liabilities, banking sector credit, and credit to the private sector. Results extracted from their study showed that financial progress incurred by FDI is significant to register growth in all countries, except for Nigeria, which portrayed no short and long-run association of concerned variables.

It is evident from previous studies that remittance inflow can develop a country's financial system and contribute to promoting economic growth. Giuliano and Ruiz-Arranz (2006) empirically investigated the nexus between remittance and growth by examining the interaction between remittance and financial progress of 29 developing countries from 1975-2002. Empirical analysis followed the Generalized Method of Moments (GMM) approach and several sensitivity tests. Their study result depicted that remittance can perform as a substitute component for the shortcoming of financial investment and promote growth, especially in less financially developed countries.

FDI may create distortions in economic policy by generating additional benefits that the government usually provides foreign investors and injecting social and cultural norms that are not congenial to the domestic country (Ram & Zhang, 2002). Agyapong, Asiamah, and Crabbe (2019) performed a study to inspect the influence of capital inflows on financial development in Ghana ranging 1970 to 2014. It employed Johansen and Juselius's multivariate co-integration approach by using annual data. Results of the study exhibited that FDI, remittance inflow, and external debt negatively affected financial progression in the long run. A significant negative relationship was found in the short run, except for FDI and financial progress, which was not significant.

Volatility in the remittance inflow may appear to affect the remittance-growth nexus negatively. Coulibaly (2015) concluded that there was no firm evidence to support the view that remittance enhanced financial advancement in Sub-Saharan African (SSA) countries. By the usage of yearly time series data ranging from 1979 to 2009, Paul and Das (2011) asserted that no evidence hold for remittance-led growth in short-run however, they identified a long-run nexus between remittance and growth in Bangladesh.

Masuduzzaman (2014) analyzed remittances' contribution to Bangladesh's economic growth and its interaction with financial development by utilizing annual data covering 1981 to 2013. The study employed the Johansen co-integration technique and vector error correction model to derive out short run and long run association. The Granger Causality test was executed to figure out possible endogenous relations. Findings revealed a long-run contribution of remittance to economic growth and a significant positive impact on financial development. Furthermore, Muktadir-Al-Mukit and Islam (2016) demonstrated that remittance assists the amount of credit disbursement in Bangladesh's banking sector. Precisely, the accessibility of loans to business entrepreneurs indirectly promotes the economic progress of Bangladesh.

Inducing annual data from 1986 to 2013, Jamil and Hasan (2013) inspected the long-run association between FDI and real GDP in Bangladesh. The co-integration technique was applied, and the Granger Causality to depict the causal effect. The result indicated no significant long-run

nexus between FDI and real GDP. On the contrary, they observed two-way granger causality between study variables and concluded that FDI could be counted as an emerging tool to accelerate the growth performance of Bangladesh.

Qamruzzaman and Jianguo (2017) attempted to inspect financial innovation's influence on Bangladesh's economic performance from 1980-2016. The induced Autoregressive Distributed Lag(ARDL) approach and Granger causality-based Error Correction Model (ECM) in driving the outcome. Financial innovations were used as a proxy by domestic credit to the private sector as a percent of GDP and Broad to Narrow money (M2/M1) as a percent of GDP. Findings provided evidence about the long-run association between financial innovation and Bangladesh's economic growth. Further, the circulation of credit to the private sector and monetary regulation played an essential role in accelerating growth performance. By implementing Johansen's multivariate co-integration procedure for Bangladesh and India from 1974 to 2015, Sikder, Wadud, and Hasan (2016) figured out the long-run connectivity between financial development and economic growth. Bidirectional causal relation was also supported between financial progress and growth.

Given the above analysis observed in previous works of literature, it can be concluded that there is still room to conduct research identifying capital inflows' effect on Bangladesh's financial development process. Most of the previous studies were carried out by yearly data. In contrast, our study utilized monthly data to better represent the economy by capturing seasonal and unanticipated changes in the economy.

EMPIRICAL MODEL AND DATA

The focus of the study is to assess how the inflow of capital can contribute to financial progress in Bangladesh's economy. In line with previous studies, such as Huang (2010), Aggarwal et al. (2011), Misati et al. (2019), Agyapong et al. (2019), and Masuduzzaman (2014), the study adopted several proxy variables as a measure of financial development. In particular, we consider ratios of bank credit to GDP (denoted by BNCR) and bank deposit to GDP (denoted by BNDEP) as financial development proxies which are also dependent variables of our model. The key explanatory variables referring to the channels of capital inflows are a foreign direct investment, remittance inflow, and inflow of foreign aid. Other relevant control variables include the consumer price index, liquid liabilities, trade openness, and real effective exchange rate (REER). Following the earlier studies, the general model and the other two models considering separate dependent variables can be stated as:

$$FIND_t = \alpha_0 + \beta_1 FDI_t + \beta_2 REM_t + \beta_3 FRAID_t + \beta_4 CPI_t + \beta_5 LLB_t + \beta_6 OPEN_t + \beta_7 REER_t + U_t \quad (1)$$

Model 1:

$$BNCR_t = \alpha_0 + \beta_1 FDI_t + \beta_2 REM_t + \beta_3 FRAID_t + \beta_4 CPI_t + \beta_5 LLB_t + \beta_6 OPEN_t + \beta_7 REER_t + U_t \quad (2)$$

Model 2:

$$BNDP_t = \alpha_0 + \beta_1 FDI_t + \beta_2 REM_t + \beta_3 FRAID_t + \beta_4 CPI_t + \beta_5 LLB_t + \beta_6 OPEN_t + \beta_7 REER_t + U_t \quad (3)$$

Where, FIND = Financial Development, BNCR = Bank Credit to GDP, BNDP = Bank Deposit to GDP, FDI = Foreign Direct Investment inflow, REM = worker's remittance inflow, FRAID = Foreign Aid, CPI = Consumer Price Index, LLB = Liquid Liabilities (M2 to GDP), OPEN = Openness to international trade, REER = Real Effective Exchange Rate, α_0 = a constant term, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$ = parameters to be estimated, U = Stochastic Error term, and t = time period.

In this study, FDI refers to the inward flow of direct investment by acquiring equity capital and long-term and short-term capital. As a driver of foreign exchange earnings, FDI plays a potential role to developing countries by generating private investments in infrastructure and energy,

ultimately expanding job opportunities. By facilitating compatible investment conditions, FDI is expected to influence the credit management policy under banking channels. Another key explanatory variable of remittance is the aggregation of personal net transfers and employees' compensation. It is believed that remittance flow can positively contribute to financial progress by ensuring credit and foreign exchange availability. However, continual remittance flow can spoil the saving nature, obstructing the financial intermediation process (Aggarwal, Demirgüç-Kun, & Pería, 2011). Foreign aid considers official development assistance and official aid received from donor countries. Members of the Development Assistance Committee (DAC) generate grants and concessionary loans that can assist the development process of recipient countries.

As control variables, we include CPI, which measures overall change in consumer price regarding a representative basket of goods and services. Previous studies delineated that a high level of inflation can lessen saving efforts and distort investment conditions (Gashe, 2017). We also include liquid liabilities (M2 to GDP), which account for the broadest category of financial intermediation and comprise all three financial institutions of the central bank, deposit money banks, and other financial institutions. In our study, trade openness is the ratio of the sum of export and import to the GDP of the concerned nation. Trade openness can promote financial activities within the economy by exercising trade finance and other trading instruments. However, openness to trade at a higher level may open up the road to internal uncertainty and also confront the economy with global shocks (Arora & Vamvakidis, 2004). In place of a nominal or real exchange rate, our study utilized the real effective exchange rate (REER), which measures a currency value against some other foreign currencies and is divided by a price deflator. The appreciation of REER is considered a loss of trade competitiveness by making the export expensive compared to a cheaper import value.

In this paper, the co-integration technique adopts the Autoregressive Distributive Lag (ARDL) Bound testing framework utilized widely by Pesaran and Pesaran (1997); and Pesaran et al. (2001). The ARDL approach provides additional advantages compared to Engle & Granger (1987) and Johansen & Juselius (1990). For instance, the ARDL model is applicable in the case of small samples (Ghatak & Siddiki, 2001); however, the Johansen technique requires a larger sample to generate valid outcomes. Another advantage is associated with the number of lags since variables under the ARDL approach can have different lags, which is impossible for conventional models. Finally, the ARDL model can be applied, disregarding the order of the variables. That means the order of variables can be either I(0) or I(1) or a mixture of both and avoids the pre-testing requirement (Pesaran, Shin, & Smith, 2001).

Data Source

The study incorporates the monthly data spanning January 2011 to December 2021 according to the latest availability. The data are extracted from Monthly Economic Trends and Major Economic Indicators of Bangladesh Bank. Most of the present studies are conducted based on yearly data. On the other hand, we executed our analysis by using monthly data. The rationale for using such variables is to capture rapid changes in economic conditions since some explanatory variables of remittance, inflation, and REER frequently varies in response to shocks. Furthermore, low-frequency data often omits valuable high-frequency information, which is crucial to attaining equitable outcomes.

METHODOLOGY

Testing the Variables for Unit Root

There is a possibility of non-stationarity in the time series application case. The existence of unit roots generally causes non-stationarity incurring uncertainty in the model. More precisely, the result becomes spurious if unit roots exist in the data. Therefore, it is required to figure out data stationarity before examining the long-run relation. Several tests are proposed in economics

literature by Augmented Dickey-Fuller (1979) and Phillips-Perron (1988) test to check whether the time series is stationary or not. Our study adopted the ADF approach to testing the stationarity property. The functional form of the model is considered as below:

$$\Delta y_t = \mu + \theta y_{t-1} + \Psi \Delta y_{t-1} + \delta_t + \epsilon_t \quad (4)$$

Here, ϵ_t stands for the white noise term. The ADF test procedure can be performed by checking the following hypothesis test:

H_0: $\theta = 0$ or y_t is non-stationary
H_1: $\theta = 1$ or y_t is stationary

To determine stationarity, we must compare ADF test statistics with the critical values found in Fuller's table. If $\theta = 0$, the calculated test statistic is higher than critical values, and we cannot reject the null hypothesis of non-stationarity. And then, y_t becomes non-stationary. However, if $\theta = 1$, the opposite result will happen, and y_t resembles stationary form.

ARDL Model

For the ARDL model application, pre-testing of the associated orders of variable is not necessary. However, the procedure may crush if I(2) order series appears. According to Ouattara (2004), conduction of unit root test is still necessary for ARDL application to ensure that none of the variables is formed with I(2) order. Following Pesaran et al. (2001), the representation of the ARDL model is specified below:

$$\Delta FIND_t = \alpha_0 + \beta_1 FDI_{t-1} + \beta_2 REM_{t-1} + \beta_3 FRAID_{t-1} + \beta_4 CPI_{t-1} + \beta_5 LLB_{t-1} + \beta_6 OPEN_{t-1} + \beta_7 REER_{t-1} + \sum_{i=1}^{n} \theta_1 \Delta FDI_{t-i} + \sum_{i=1}^{n} \theta_2 \Delta REM_{t-i} + \sum_{i=1}^{n} \theta_3 \Delta FRAID_{t-i} + \sum_{i=1}^{n} \theta_4 \Delta CPI_{t-i} + \sum_{i=1}^{n} \theta_5 \Delta LLB_{t-i} + \sum_{i=1}^{n} \theta_6 \Delta OPEN_{t-i} + \sum_{i=1}^{n} \theta_7 \Delta REER_{t-i} + \varepsilon_t \quad (5)$$

The ARDL model follows two steps procedure. Firstly, the null hypothesis ($i.e.\ H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$) representing no long-run association is examined by executing an F-test. After that, the F-statistic is required to compare with the critical values mentioned by Pesaran et al. (2001). The null hypothesis expressing no co-integration cannot be eliminated if F-statistic is found below lower bound critical values. On the contrary, if F-statistic identified surpasses the upper bound, the null hypothesis can be rejected. Finally, the test result turns inconclusive if the F-statistic stays between both types of critical values.

As the next step, estimating the long and short-run parameters is required once the long-run association among variables is established. However, there is still scope of having disequilibrium in the short run. Hence, the error correction mechanism is resorted to correct such equilibrium mismanagement. Then, the expression of the model can be stated as below:

$$\Delta FIND_t = \alpha_0 + \sum_{i=1}^{n} \theta_1 \Delta FDI_{t-i} + \sum_{i=1}^{n} \theta_2 \Delta REM_{t-i} + \sum_{i=1}^{n} \theta_3 \Delta FRAID_{t-i} + \sum_{i=1}^{n} \theta_4 \Delta CPI_{t-i} + \sum_{i=1}^{n} \theta_5 \Delta LLB_{t-i} + \sum_{i=1}^{n} \theta_6 \Delta OPEN_{t-i} + \sum_{i=1}^{n} \theta_7 \Delta REER_{t-i} + \delta ECT_{t-1} + \varepsilon_t \quad (6)$$

Where, ECT_{t-1} denotes the error correction term, and δ presents the speed of adjustments to equilibrium if any shock appears in the short run. The negative sign of the term (ECT_{t-1}) is obligatory to ensure backward convergence to the long-run association.

EMPIRICAL RESULTS AND DISCUSSION

This section illustrates the estimation results and associated interpretation of that. As our data analysis method, we carried out the Augmented Dickey-Fuller (ADF) for unit root test, lag selection criteria for the ARDL model, the bound test for Cointegration, Error Correction Method (ECM), and diagnostic tests.

Unit Root Test

Table 1 exhibits the unit root test results by applying the Augmented Dickey-Fuller (ADF) procedure. Although the ARDL model won't require a unit root test as imperative is performed to ensure that

none of the variables comes out with I(2) order (Nkoro & Uko, 2016). As evident from test results, the series of bank deposits, remittances, liquid liabilities, and trade openness are stationary at both level and first difference, marked by I(0). Contrarily, the rest of the series are identified as stationary at first difference only, i.e., I(1). Since all the series are generated with the order I(0) or I(1), abstaining from any I(2) order further qualifies to perform the ARDL application.

Variables	Level		First Difference		Order of Integration
	Test Statistics	Probability	Test Statistics	Probability	
BNCR	-0.7688	0.965	-12.7464	0.000	I(1)
BNDP	-3.4942	0.044	-1.3594	0.000	I(0)
FDI	-2.8416	0.185	-10.3382	0.000	I(1)
REM	-3.3471	0.063	-18.2835	0.000	I(0)
FRAID	-2.4115	0.372	-6.7553	0.000	I(1)
CPI	0.5028	0.999	-5.1718	0.000	I(1)
LLB	-3.5745	0.036	-1.1031	0.000	I(0)
OPEN	-4.1232	0.007	-9.1971	0.000	I(0)
REER	-2.6901	0.242	-7.4195	0.000	I(1)

Table 1. Results of ADF Test for Unit Root Analysis

**Note: The Augmented Dickey-Fuller (ADF) critical values are based on McKinnon, and optimal lag is chosen based on the Schwarz Information Criterion (SIC)*

Before estimating the ARDL bound test, it is considered inevitable to prescribe the appropriate order of the variables (Pesaran, Shin, & Smith, 2001). The optimal lag number can be chosen based on Vector Autoregressive Lag Length Selection Criteria. To ascertain the lag length order among several criteria, the AIC delivers more robust results than SC and HQ (Liew, 2004).

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-4773.517	NA	3.86E+22	74.71121	74.88946	74.78363
1	-3804.155	1802.408	2.78E+16	60.56492	62.16919*	61.21674
2	-3675.805	222.6073	1.03E+16	59.55945	62.58973	60.79067*
3	-3593.454	132.5335	7.94E+15	59.27272	63.72902	61.08333
4	-3523.542	103.7757*	7.64e+15*	59.18034*	65.06265	61.57036

Table 2. VAR Lag-Length Selection Criteria: Model 1

*Note: * indicates the lowest criteria of each variable*

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-4648.219	NA	5.45E+21	72.75342	72.93167	72.82585
1	-3645.146	1865.089	2.32E+15	58.08041	59.68468*	58.73223
2	-3518.936	218.895	8.86e+14*	57.10838*	60.13866	58.33960*
3	-3457.378	99.06985*	9.47E+14	57.14654	61.60284	58.95716
4	-3407.373	74.22675	1.24E+15	57.3652	63.24752	59.75522

Table 3. VAR Lag-Length Selection Criteria: Model 2

*Note: * indicates the lowest criteria of each variable*

Since our models consider bank credit (BNCR) and bank deposit (BNDEP) as proxies for financial development, Table 2 and 3 for associated models illustrate optimal lag length results. According to AIC criteria, the maximum lag length is 4 while estimating model 1. Again, in respect of model 2, the maximum number of lags is 2 based on AIC. After confirming the appropriate lag number, it is prudential to proceed with ARDL bound test.

ARDL Bound Test for Co-integration

F-statistic	6.166676	
Level of Significance	Lower Bound I(0)	Upper Bound I(1)
10%	2.03	3.13
5%	2.32	3.50
2.50%	2.60	3.84
1%	2.96	4.26

Table 4. Bound Test for Co-integration: Model 1

**Source: Author's own calculation*

F-statistic	4.466598	
Level of Significance	Lower Bound I(0)	Upper Bound I(1)
10%	2.03	3.13
5%	2.32	3.50
2.50%	2.60	3.84
1%	2.96	4.26

Table 5. Bound Test for Co-integration: Model 2

**Source: Author's calculation*

The computed F-statistics (6.166676) for model 1 depicted in Table 4 is higher than associated lower and upper bounds at 1%, 2.50%, 5%, and 10% critical values, respectively. Likewise, model 2's F-statistics is 4.466598 (Table 5), which exceeds both categorized critical values at the corresponding significance level. All these outcomes assist in deciding that null hypothesis expressing no co-integration turns invalid for both models and justify the long-run association of the variables. The long-run nexus among remittance flow, FDI, foreign aid, and financial development is consistent with the previous studies of Masuduzzaman (2014) and Irandoust (2021).

Variable	Coefficient	Standard Error	t-statistic	Probability
FDI	0.0004	0.0003	1.2842	0.2018
REM	-0.0049*	0.0025	-1.9088	0.0589
FRAID	0.0030*	0.0016	1.8418	0.0682
CPI	0.1823***	0.0578	3.1520	0.0021
LLB	0.6937***	0.1503	4.6153	0.0000
OPEN	-0.1934**	0.0958	-2.0178	0.0460
REER	-0.1235	0.0928	-1.3309	0.1860
C	9.6980	5.2921	1.8326	0.0696

Table 6. ARDL Long-run Coefficients: Model 1

*Note: *, ** and *** denote 10%, 5%, 1% level of significance*

Variable	Coefficient	Standard Error	t-statistic	Probability
FDI	0.0000	0.0001	-0.0329	0.9738
REM	0.0015	0.0012	1.2596	0.2104
FRAID	-0.0023	0.0015	-1.5839	0.1160
CPI	0.0327	0.0285	1.1458	0.2543
LLB	0.8192***	0.0697	11.7541	0.0000
OPEN	-0.0141	0.0431	-0.3283	0.7433
REER	0.0229	0.0422	0.5412	0.5894
C	2.3148	2.5661	0.9021	0.3689

Table 7. ARDL Long-run Coefficients: Model 2

*Note: *, ** and *** denote 10%, 5%, 1% level of significance*

Table 6 posits the long-run coefficients between capital inflow components and bank credit (model 1). The FDI coefficient (0.0004) depicts a positive association with financial development (bank credit), although the result cannot be statistically significant. Remittance is inversely linked with banking credit channels, and the long-run association between these two variables is not established. Precisely, a unit increase in remittance would lead to a fall in financial development by 0.0049 units. In the case of foreign aid association with financial progress (bank credit), the outcome is positive (0.0030) and significant. An increment of 1-unit foreign aid is responsible for incurring 0.0030 units of bank credit flow.

Table 7 represents the long-run association of capital inflow variables with bank deposits (model 2). Likewise, to the previous model, the FDI outcome hints a positive; however still managed an insignificant coefficient. That suggests that the long-run co-move of FDI with bank deposits cannot be justified. Similarly, the remittance generates a positive nexus with financial progress (bank deposit); however, the coefficient (0.0015) reports an insignificant outcome. Contrary to the prior result for foreign aid, it is negatively associated with bank deposits (-0.0023) in the long run. Nevertheless, the negative outcome doesn't appear as a statistically significant one.

Control variables involving consumer price index (CPI) and liquid liabilities (LLB) generate positive associations with both financial representative variables, whereas significant LLB appeared in both models. Bello et al. (2020) depicted that liquid liabilities are necessitated to ensure credit availability for investment promotion. Likewise, CPI outcome, trade openness, and REER propagate a mixture of signs responding to both cases.

All these results imply that FDI and Remittance somehow seem to thwart the financial inclusion process in the long run for Bangladesh's economy. These outcomes signify that FDI inflow cannot pass through the financial system channels in Bangladesh. Foreign investors are likely to repatriate the profits to their home countries instead of investing them due to the non-existence of compatible foreign investment conditions and policies. The remittance inflow sometimes distorts the saving efforts of recipients and, thus, fails to enhance financial intermediation (Aggarwal, Demirgüç-Kun, & Pería, 2011). Access to unofficial channels through the 'Hundi' market is another obstacle to imposing the free movement of capital under the official financial system in Bangladesh. Foreign aid is responsible for expanding Bangladesh's liquidity position and thereby enhances deposit creation and credit disbursement.

Short-run Result

Variable	Coefficient	Standard Error	t-statistic	Probability
D(BNCR(-1))	0.1267*	0.0721	1.7556	0.0819
D(FDI)	-0.0001	0.0002	-0.5737	0.5674
D(REM)	-0.0052***	0.0010	-5.3883	0.0000
D(FRAID)	0.0011*	0.0006	1.8583	0.0658
D(CPI)	-0.0571	0.0653	-0.8744	0.3838
D(CPI(-1))	0.2801**	0.1106	2.5314	0.0128
D(CPI(-2))	-0.0465	0.0908	-0.5118	0.6098
D(CPI(-3))	0.1088*	0.0596	1.8262	0.0705
D(LLB)	1.6004***	0.1618	9.8910	0.0000
D(OPEN)	0.0762**	0.0352	2.1667	0.0324
D(REER)	-0.0458	0.0333	-1.3758	0.1717
CointEq(-1)	-0.3711***	0.0694	-5.3462	0.0000

Table 8. ARDL Short-run Coefficients: Model 1

*Note: *, ** and *** denote 10%, 5%, 1% level of significance*

Variable	Coefficient	Standard Error	t-statistic	Probability
D(BNDP(-1))	-0.0929	0.0684	-1.3586	0.1770
D(FDI)	0.0000	0.0000	-0.0328	0.9739
D(REM)	-0.0013***	0.0003	-3.7129	0.0003
D(FRAID)	0.0005***	0.0002	2.7129	0.0077
D(FRAID(-1))	0.0006***	0.0002	3.3860	0.0010
D(CPI)	-0.0382*	0.0214	-1.7823	0.0774
D(LLB)	0.5559***	0.0543	10.2315	0.0000
D(OPEN)	0.0362***	0.0115	3.1442	0.0021
D(REER)	0.0057	0.0107	0.5353	0.5935
CointEq(-1)	-0.2508***	0.0561	-4.4741	0.0000

Table 9. ARDL Short-run Coefficients: Model 2

*Note: *, ** and *** denote 10%, 5%, 1% level of significance*

Tables 8 and 9 highlight the short-run coefficients associated with the error correction term. The crucial part of the short-run model is about the sign and coefficient linked with the ECM term. More precisely, the error correction term assures convergence towards the equilibrium whenever short-run estimation suffers a disequilibrium problem. In both models, the ECM terms are negative and highly statistically significant, proving the long-run adjustment. Succinctly, approximately 37% and 25% of the previous error is fixed in the current period. According to previous work (Banerjee, Dolado, & Mestre, May 1998), an effective ECM term is necessary for a stable long-run relationship.

Diagnostic Result

The diagnostic tests are performed to ascertain that serial correlation and heteroscedasticity cases will not arise in the case of our long-run coefficients and ECM term.

	Model 1		Model 2	
Diagnostic Test	Test Statistic	p-value	Test Statistic	p-value
Serial Correlation LM Test	1.8561	0.1236	1.4091	0.2487
Heteroscedasticity Test	0.7759	0.5430	0.3547	0.7021

Table 10. ARDL Diagnostic Test

In Table 10, the results obtained from ARDL diagnostic tests are demonstrated. While considering the serial correlation context, the serial correlation LM Tests developed by Breusch-Godfrey is applied where accompanying p-values suggest the non-existence of a serial correlation problem. In the heteroscedasticity test application, the null hypothesis, meaning no heteroscedasticity, cannot be rejected in both cases. That suggests that models have no serial correlation. The CUSUM and CUSUMSQ tests are applied to ensure constancy and accuracy of long-run parameters since inadequate modeling of short-run parameters may give rise to instability situations (Bahmani & Oskooee, 2001).

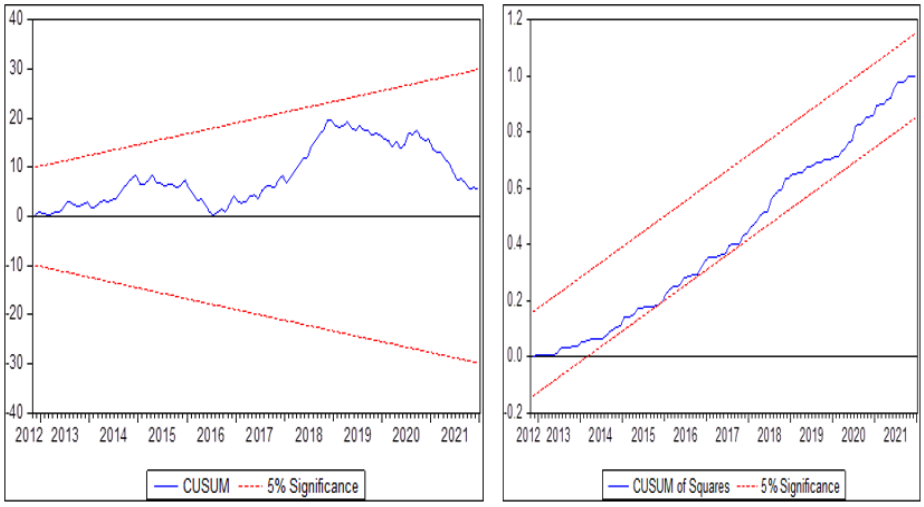

Figure 4: Stability Tests (CUSUM and CUSUMSQ Test)- Model 1

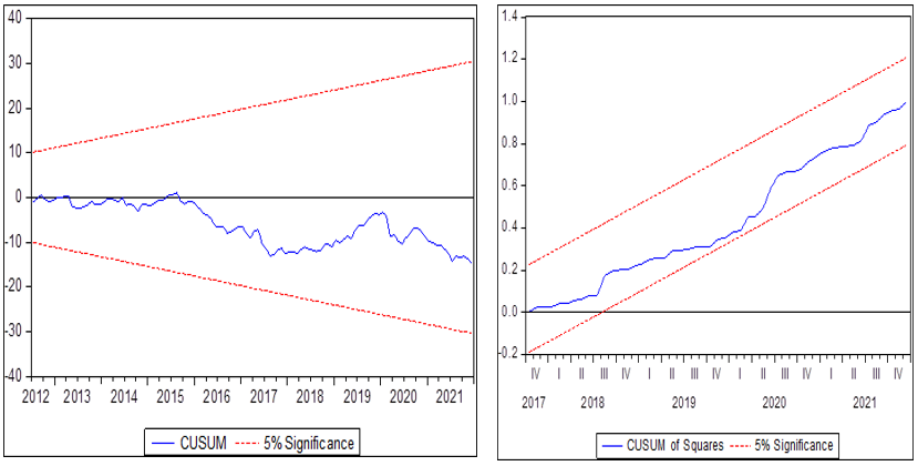

Figure 5: Stability Tests (CUSUM and CUSUMSQ Test)- Model 2

Figures 4 and 5 portraits the plots of recursive residuals. The stability of the models comes up with proof whenever the plots stay within the critical bounds. The plots of CUSUM and CUSUMSQ residuals are detected inside critical bounds at a 5% significance level for both models, satisfying the stability condition.

CONCLUSIONS & POLICY RECOMMENDATIONS

Over the last two decades, Bangladesh observed a significant rise in the inward flow of capital through remittance, FDI, and net official aid which necessitates a review to check the importance of various inflow channels on the financial aspect in particular. The reliance upon overseas capital is essential to fill up budget deficit requirements and to ensure the availability of funds to the financial system. The Bangladesh financial system is mostly characterized by the banking and microfinance sector compared to the equity market segment. A facilitating way for judging the well-functioning financial system of Bangladesh is to monitor how the inflow of funds contributes to the banking credit disbursement and deposit formation.

On this background, this paper investigated the role of capital inflows in the financial development process of Bangladesh concentrating on bank credit and deposit channels. By utilizing monthly data spanning from 2011 to 2021, the study employed the Autoregressive Distributive Lag (ARDL) model proposed by Pesaran and Pesaran (1997) to explore the short-run and long-run nexus. The overall long-run results posit that the inflow of remittance and FDI won't matter to a great extent for accelerating the financial progress of Bangladesh. The foreign aid observed a positive co-move with bank credit in particular in the long run. The findings of capital inflow components with financial development are consistent with the result of Agyapong et al. (2019) who documented a significant negative association between FDI, external debt, and remittance inflows with financial development in Ghana.

Results of the study reveal a policy window to formulate and implement policies to ensure FDI and remittance inflow occurrence under the financial system of Bangladesh. Foreign investors have a general tendency to push back their profits due to not having compatible investment conditions. Bangladesh's government should enact policies to upgrade existing infrastructures and provide cash incentives and liberalized tariff packages to attract the inward flow of FDI. Furthermore, policymakers should adopt policies to ensure repatriation of profits earned by overseas firms. To ensure inflow of remittance under the official channels, the government should mobilize modernization of migration management.

Several policies may be initiated by offering higher interests to remittance depositors compared to local currency depositors and allocating resources to provide soft loans to migrant workers. To curtail remittance inflow under informal channels, it is imperative to reduce the cost of remittance by facilitating mobile financial services and fellowship actions among banks, telecom companies, and microfinance institutions.

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