# Impact of Economic and Noneconomic Factors on Inflow of Remittances into Bangladesh: Application of Robust Least Squares Method

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**Research Article**

## Abstract

***Purpose:*** *Remittance plays an important role in the economy of Bangladesh. It also contributes to the change in the social structure and standard of living. The purpose of the study is to identify the economic and non-economic determinants of the remittance inflow into Bangladesh.*

***Methodology:*** *The study considered two types of variables as the determinants of the remittance inflow: economic and non-economic. Economic determinants of remittances inflows included exchange rate, education, economic growth rate, and market interest rate. The non-economic determinants covered control of corruption, government effectiveness, and political stability. Monthly data were used for the case of economic determinants from 2014 to 2020 and annual data were used in the case of non-economic determinants from 1996 to 2018. The marginal effect of each variable has been analyzed by using the Robust Least Squares (RLS) method.*

***Results:*** *The estimated results of this study state that, economic determinants like capital formation and education factors have a positive and significant impact on remittances inflows in both static and dynamic cases. However, the exchange rate does not create a positive impact due to volatility. The RLS estimation shows the control of corruption has a positive impact on remittances inflows whereas government effectiveness and political stability hurt remittances inflows in Bangladesh.*

***Implications:*** *The current study identified the significant determinates of remittances inflows in Bangladesh. The findings have implications for policy formulation as regard remittances and non-resident Bangladeshis.*

**Keywords**: Remittance, Economic Determinants, Noneconomic Determinants, RLS, Bangladesh

## 1. Introduction

The economic and social development in Bangladesh has been driven by remittance inflows. Remittance is the 2nd largest financial contributor to Bangladesh's economy led by readymade

garments. The economy has accomplished a GDP growth rate of 6.5 percent over the last twenty years, fundamentally determined by the ready-made garments, wage earners sector, and agriculture production. To fight the extreme poverty levels and improve the standard of living in developing countries there is a need for a generous inflow of external resources to fill the reserve funds and compensate for the foreign trade deficit. This will expand the pace of capital aggregation and development. One of these external wealth is remittances that address an enormous extent of the monetary streams (Catrinescu *et al*., 2009; Clemens *et al*., 2014; Sobiech, 2019).

Through microeconomic and macroeconomic operations, remittances can influence economic growth and development (Nwaogu & Ryan, 2015; Pradhan, 2016; Uddin *et al*., 2020). Supporting growth in the economy is the drive to facilitate increased employee remittances. Prospective pathways of positive remittance inflow effects on the growth and development scenario of developing economies include the influence of these remittances on the formation of capital, investment, the balance of payment (BOP), infrastructure development, exports, and imports, technological progress, and resource accumulations. Remittances have also an impact on household consumption patterns and improve the social standard of people. For a long time, the RMG area overwhelmed the monetary inflows to Bangladesh yet as of late, remittances and pharmaceutical industries have played an imperative role to raises the national resources. As seen by Barajas *et al*. (2009) and Bettin & Zazzaro (2012), the remittance is a move from worldwide transients to relatives in their nation of birthplace address perhaps the biggest wellspring of monetary streams to growing countries like as Bangladesh, where exchange rate factors play a vital role to maintain the stability of remittances inflows (Rahman *et al*., 2020). The increment in the other external financial sources, for example, FDI, portfolio investment, and BOP could be credited to the moderate government effectiveness, control of corruption, rule of law, and political stability as the drive for FDI and superior business environment for the domestic investor.

The economic growth of a country is driven by several factors like as formation of capital, investment, the balance of payment (BOP), infrastructure development, exports and imports, technological progress, and resource accumulations. Economic growth is also derived from the noneconomic determinants like government effectiveness, control of corruption, rule of law, and political stability. If local capital sources are insufficient, an alternative is external sources (Bilgin & Dinc, 2019; Ampah & Kiss, 2019). A better type of potential capital could be remittances. The impact of remittances on the economic growth of Bangladesh has not earned the recognition it needs. A lack of government intervention and influence of middlemen still exist. The exchange rate volatility and money transaction informal chain are still facing challenges. Given the significance of the remittances in the economy of Bangladesh, the key aim of this study is to analyze the economic and non-economic determinants of remittances inflows in Bangladesh. The specific objectives of the study are:

i. To identify the determinants of remittances inflows
ii. To measures the impact of economic determinates on remittances inflows in Bangladesh

iii. To investigates the impact of non-economic determinates on remittances inflows in Bangladesh

## 2. Literature Review

The term remittance can be defined as the inflow of money that results from migration (Kapur, 2005; Ratha, 2005). The migration theories take into account the different labor market opportunities open to workers in developed countries. Kumar *et al*. (2018) inspect the presence of a long-run relationship between remittances and total factor of production (TFP) utilizing the ECT and DOLS method. The outcomes demonstrate that migration has limited consequences for TFP development in India and Bangladesh. Notwithstanding the two countries getting the generous measure of settlements, they note that Bangladesh has a U-shape relationship while India has a modified U-shape relationship with TFP enhancement.

Siddiqui and Abrar (2001) analyzed the cost factors of remittance inflows. They argued that cost factors of remittance inflows are not a significant factor, rather the efficiency of staff, the idea of money transfer, inconsistencies in exchange rates, and the educational requirements are the significant factors to determine remittance. The general adequacy of the monetary states of the host and home countries, they recollect that remittances are more delicate to the monetary states of the host country than to the home country's financial conditions (El-Sakka & McNabb 1999; Al-Assaf & Al-Malki, 2014; Dilanchiev & Sekreter, 2016; Mustafa & Ali, 2018). The outcome of another examination by Ruiz *et al*. (2009), Olayungbo, and Quadri (2019) uncovered that remittances have a positive impact on home country's currency devaluation and a negative relationship with the volatility of the exchange rate. The volatility case of the exchange rate current account deficit creates economic vulnerability (Rahman & Dilanchiev, 2021). The way that migration factors influence the degree of remittances is also affirmed by this examination. Additionally, the investigation gives mixed evidence concerning the connection between remittances and per capita Gross domestic products of the host country. Gupta & Hegde (2009) in examining the instance of India find that increment in movement and absolute profit of migrants can clarify the development of remittances. As per this examination, the financial states of home and host country decidedly affect remittances separately. The study by Qayyum *et al*. (2008) and Naeem *et al*. (2019) on remittances inflows to Pakistan shows that a higher premium in the labor market causes a hindering impact on remittances. The examination additionally recognizes a level of productivity and speed of exchange as significant factors in determining remittances in Pakistan. As a development platform for the host country, remittances have a potentially positive effect. The impacts of remittances on growth could be broken down into their impacts on poverty, savings, investment, employment, and consumption as well as the allocation of resources (Pradhan *et al*., 2008; Benhamou & Cassin, 2021). The influence of remittances on economic growth in the recipient economies is anticipated to remain through savings and investment and to have a short-term effect on aggregate consumption and production. Workers' remittances are a part of global savings, balancing national savings by raising the total amount of investment capital and sustainable BOP statements (Sinning, 2011; Delpierre & Verheyden, 2014; Kokorović *et al*., 2020).

De Vaal & Ebben (2011) directed an exact investigation about the role of control of corruption (CC) financial development and the transmission channels through which debasement influences the Gross domestic product development rate (Mo, 2001). The outcomes of his investigation show that CC has a negative impact on the portion of the investment and human resources. Moreover, income imbalance (inequality) additionally negatively affects monetary development. He presumed that the increment in defilement level diminishes the financial development and the main channel through which debasement influences economic development is political precariousness. Gyimah-Brempong (2002), directed an investigation to see the impact of defilement on financial development and income distribution in African countries. He utilized a dynamic panel model to produce the outcomes and the result of this examination demonstrated that CC diminishes economic development straightforwardly and by implication through a diminished interest in physical and human capital. A similar finding from Latin America was investigated by (Dobson & Ramlogan-Dobson, 2010).

Khan & Islam (2013) state that remittances increase economic growth and there is a positive relationship between remittances and inflation in Bangladesh. Similar results have been found by Uzagalieva & Menezes, (2009), Majumder, (2016), Hassan & Shakur, (2017), and Dilanchiev *et al*., (2021). Hassan *et al*. (2016) analyzed the growth effects of remittance in Bangladesh. In particular, the authors have recommended that a U-shape connection existed between remittances and factors profitability (FP) in the long-run development of Bangladesh at the macroeconomic level. At first, the development impact of migration is hypothesized to be negative however it gets a positive impact in the long run. They also found that a non-linear relationship is expected to be available between remittances and GDP. The labor market and exchange rate also have a positive impact on remittance inflows in Bangladesh (Chowdhury & Rabbi, 2014).

## 3. Methodology

To analysis the impact of economic and non-economic determinants on remittances inflows in Bangladesh, this study considered the dependent variable as remittances (REM) that represents monthly remittances inflows (Million USD). Detail description of the independent and dependent variables has been presented in Table 1. The independent variables of this study are divided into two categories, (1) the economic and (2) non-economic determinants of remittances inflows. Economic determinants are exchange rate, education, economic growth rate, market interest rate. The non-economic determinants are control of corruption, government effectiveness, and political stability which are the common determinants of remittance inflows in Bangladesh. The current study used the education factor as an economic determinant. According to Barro (2001), human capital is a determinant of economic growth where years of schooling (education) work to enrich the human capital. In the aspect of social infrastructure, education, health care facilities are significant factors of social infrastructure which help to raise national development. The efficiency of education has a positive association with economic growth and education factor has been contributed to national development as a social factor as well as an economic factor (Sianesi & Reenen, 2003; Islam *et al.*, 2007; Tchantchane *et al.*, 2013;

Wadood & Hossain, 2017; Musakwa & Odhiambo, 2019). The monthly data have been used to estimate the static and dynamic model. In Robust Least Squares (RLS) estimation, monthly data have been used for the case of economic determinants from 2014 to 2020 and annual data have been used in the case of non-economic determinants from 1996 to 2018. GDP labor forces and education variable converted annual series to monthly series due to assuring the strength of the study. The previous researcher argues that the annual GDP, labor, and education data can be converted to monthly data (Hoenack & Weiler, 1979; Abeysinghe, 1998; Yamane 2000; Mittnik & Zadrozny, 2003; Chiu *et al*., 2011; Hara & Yamane, 2013; Owyang *et al*., 2013; Wutsqa *et al*., 2014; Coruh *et al*., 2015). Moreover, the impacts of economic and non-economic determinants on remittances inflows have been analyzed with static and dynamic phases. The marginal effect of each variable is analyzed by using the Robust Least Squares (RLS) method.

**Table 1: Details of Selected Variables**

| Variable | Variable Details |
|---|---|
| REM | Monthly Remittances Inflows (Million USD) |
| GDP | GDP per capita (constant 2010 US$) |
| EDU | Literacy rate, youth total (% of people ages 15-24) |
| INR | Money market rate (bank rate) |
| EX | Exchange rate (in terms of USD) |
| LF | Labor force, total |
| K | Gross fixed capital formation (current US$) |
| CC | Control of Corruption: Estimate |
| GE | Government Effectiveness: Estimate |
| PS | Political Stability and Absence of Violence/Terrorism: Estimate |

### 3.1. Data Sources

The world development indicators (WDI) and Reports of Bangladesh Bank (BB) are the key data source for economic determinants. The data for noneconomic determinants were collected from the World Bank development reports.

### 3.2 Econometric Model Specification

The functional form of the model is presented in equation 1, where remittances inflows is the dependent variable.

Model 1

$$REM = f\ (LF, K, GDP) \qquad (1)$$

$$REM_t = \beta_0\ + \beta_1 LF_t + \beta_2\ K_t + \beta_3 GDP_t + \ \varepsilon_t$$

$$LnREM_t = \beta_0\ + \beta_1 LnLF_t + \beta_2\ LnK_t + \beta_3 LnGDP_t + \ \varepsilon_t$$

Now, the dynamic analysis of Model 1 has developed in equation 2

$$LnREM_t = \beta_0 + \beta_1 LnREM_{t-1}\ + \beta_2 LnLF_t + \beta_3\ LnK_t + \beta_4 LnGDP_t + \ \varepsilon_t$$

Model 2

$$REM = f\ (EDU, EX, INR) \quad (2)$$

$$REM_t = \beta_0\ + \beta_1 EDU_t + \beta_2\ EX_t + \beta_3 INR_t + \ \varepsilon_t$$

$$LnREM_t = \beta_0\ + \beta_1 LnEDU_t + \beta_2\ LnEX_t + \beta_3 LnIMR_t + \ \varepsilon_t$$

Here, the dynamic analysis of Model 2 has developed in equation 4

$$LnREM_t = \beta_0\ + \beta_1 LnREM_{t-1} + \beta_2 LnEDU_t + \beta_3\ LnEX_t + \beta_4 LnIMR_t + \ \varepsilon_t$$

Model 3

$$REM = f\ (CC, GE, PS) \quad (3)$$

$$REM_t = \beta_0\ + \beta_1 CC_t + \beta_2\ GE_t + \beta_3 PS_t + \ \varepsilon_t$$

Where, $\varepsilon_t$ represents the error term, $t$ represents time, $\beta_1, \beta_2, \beta_3, \beta_4$represents the factors of the coefficient and $\beta_0$ represents the intercept term of econometric models.

## 4. Econometric Results

This segment presents the results of inferential measurements that have been acquired from E-views version 9.0. It is an arrangement of time series data investigation by Robust Least Square (RLS) strategy which was utilized in assessing the impact of independent variables on a dependent variable.

Table 2 summarizes the ADF unit root checks for at level and first differences, respectively. We cannot, in any case, find proof against the null hypothesis that the sequence comprises levels of unit-roots. Therefore we ignore the null hypothesis for the first differences. Both series seem to have a trend and intercept, in response to being I(1) processes. The monthly remittances inflow (REM) is used as the dependent variable in both models. From Model 1 of static estimations in Table 3, the coefficient of LnK is 0.80 which is positive and significant at one percent level of significance to determine REM. This infers that capital formation increases the foreign remittances with considering legal migration. Likewise, the coefficient of LnGDP is negative and significant because Bangladesh is a developing country where unemployment is a great issue at the national level. From Model 2, the coefficient of LnEDU is 1.36 which is positive and significant at one percent level of significance to determine REM in Bangladesh. It implies that the LnEDU clarifies a 1.36 percent expansion in REM. Besides, LnINR is positive and significant to determine REM in Bangladesh.

A dynamic estimation has been presented in Table 4. Model 1 presents the variable of Lnk as positive and significant to increase the remittances inflows. The variables LnLF and LnGDP do not create a positive impact on remittances in Bangladesh. From Model 2, the coefficient of LnEDU is 1.23 which is positive and significant at one percent level of significance to determine REM in Bangladesh. It implies that the LnEDU clarifies a 1.23 percent expansion in REM. Also, LnINR is positive and significant to determine REM in Bangladesh. The estimated results show the dynamic case of LnREM (-1) is positive but not significant in both models. The diagnostic test of required estimation is presented in Table 5 where M-1 and M-2 represent model-1 and model-2.

**Table 2: Results Unit Root Test**

| Variables | At level | At 1st difference |
|---|---|---|
| REM | -0.480 | -3.025** |
| LF | -2.991 | -9.086*** |
| GDP | -0.708 | -3.159*** |
| K | -0.277 | -4.106*** |
| EX | -3.181 | -5.968*** |
| INR | -1.110 | -3.753** |
| CC | -1.601 | -4.105*** |
| GE | -2.538 | -5.886*** |
| PS | -2.069 | -4.565*** |
| Note: *** and ** represent 1% and 5% significance level. | | |

**Table 3: Results of Static Analysis**

| Static Model | | | | |
|---|---|---|---|---|
| Variable | Model 1 Coefficient | Model 2 Coefficient | t-Statistic | Prob. |
| LNREM (Dependent Variable) | | | | |
| LNLF | -1.66 | | -1.29 | 0.20 |
| LNK | 0.80** | | 2.43 | 0.02 |
| LNGDP | -2.66*** | | -3.30 | 0.00 |
| LNEDU | | 1.36** | 1.89 | 0.05 |
| LNEX | | -0.66*** | -4.50 | 0.00 |
| LNINR | | 0.10 | 0.93 | 0.36 |
| C | 38.07** | 3.23 | 2.29/1.14 | 0.02/0.26 |
| $R^2$/Adj. $R^2$ | 0.21/0.18 | 0.22/0.19 | | |
| D-W Stat. | 1.78 | 1.87 | | |
| Note: *** and ** represent 1% and 5% significance level. | | | | |

**Table 4: Results of Dynamic Analysis**

| Dynamic Model | | | | |
|---|---|---|---|---|
| Variable | Model 1 Coefficient | Model 2 Coefficient | t-Statistic | Prob. |
| LNREM (Dependent Variable) | | | | |
| LNREM(-1) | 0.14 | 0.08 | 1.27 | 0.20/0.49 |
| LNLF | -1.37 | | -1.06 | 0.29 |
| LNK | 0.70** | | 2.07 | 0.04 |
| LNGDP | -2.43*** | | -2.93 | 0.00 |
| LNEDU | | 1.23* | 1.63 | 0.10 |
| LNEX | | -0.60** | -3.50 | 0.00 |
| LNINR | | 0.10 | 0.85 | 0.40 |
| C | 32.73** | 3.03 | 1.93/1.05 | 0.05/0.30 |
| $R^2$/Adj. $R^2$ | 0.23/0.19 | 0.21/0.17 | | |
| D-W | 2.07 | 1.99 | | |
| Note: ***, ** and * represent 1%, 5% and 10% significance level respectively. | | | | |

**Table 5: Diagnostic Test of Static and Dynamic Analysis**

| Static M-1 | | | |
|---|---|---|---|
| | J-B/Adj.$R^2$ | Pro. | Decision |
| Normality Test | 0.09 | 0.95 | Accept $H_0$ |
| Heteroskedasticity Test | 7.66 | 0.06 | Reject $H_0$ |
| Static M-2 | | | |
| Normality Test | 2.14 | 0.34 | Accept $H_0$ |
| Heteroskedasticity Test | 4.23 | 0.23 | Reject $H_0$ |
| Dynamic M-1 | | | |
| Normality Test | 0.07 | 0.96 | Accept $H_0$ |
| Heteroskedasticity Test | 5.47 | 0.24 | Reject $H_0$ |
| Dynamic M-2 | | | |
| Normality Test | 1.12 | 0.57 | Accept $H_0$ |
| Heteroskedasticity Test | 6.12 | 0.19 | Reject $H_0$ |
| $H_0$ =The residuals are normally distributed<br>$H_0$ = The residuals are Heteroskedasticity in nature | | | |

**Table 6: Results of Robust Least Squares (RLS)**

| *Variable* | *Model -1* | *Model -2* | *Model -3* |
|---|---|---|---|
| *LNREM (Dependent Variable)* | | | |
| *LNLF* | *-1.42* | | |
| *LNK* | *0.56** | | |
| *LNGDP* | *-1.71*** | | |
| *LNEX* | | *-0.53**** | |
| *LNINR* | | *0.05* | |
| *LNEDU* | | *1.25*** | |
| *CC* | | | *1.99**** |
| *GE* | | | *-1.38**** |
| *PS* | | | *3.86**** |
| *C* | *31.92*** | *3.19* | *-1.57**** |
| *Note: ***, ** and * represent 1%, 5% and 10% significance level respectively.* | | | |

The results of RLS models have been presented in Table 6. Model 1 shows that the Lnk variable is positive and significant for increasing inflows of remittances with a coefficient value of 0.56. The LnLF and LnGDP variable have no positive effect on Bangladesh's remittances. The LnEDU coefficient is 1.25 from Model 2, which is positive and important in evaluating REM in Bangladesh at a one percent level of significance. This means that a 1.25 percent rise in REM is clarified by the LnEDU. Furthermore, in Bangladesh, LnINR is positive and essential in deciding REM with coefficients of 0.05.

Model 3 of RLS estimations represents the coefficient of control of corruption (CC) is 1.99 which is positive and significant at one percent level of significance to defined REM in Bangladesh. This infers that the control of corruption increases worker remittances. The coefficient of government effectiveness (GE) creates a negative impact on determining Remittance inflows in Bangladesh where political stability (PS) has a positive and significant impact. Model 3

indicates the importance of noneconomic determinants in the case of economic and social development in Bangladesh.

## 5. Conclusion and Recommendations

The target of this study is to analyze the impact of economic and non-economic determinants of remittances inflows into Bangladesh. The robust Least Squares (RLS) method contains separate 3 models where Model 1 and 2 represent the economic determinants and Model 3 represents the non-economic determinants. A 1 percent expansion in the Link as a determinant of remittances will prompt a 0.56 percent increment in the pace of remittances in Model 1. As a determinant of remittances, a 1 percent expansion in the LnINR would cause a 0.05% rise in the rate of remittances where a 1 percent expansion in the LnEDU would cause a 1.25 percent rise in the rate of remittances which is presented in Model 2. Model 3 presents the non-economic determinants where control of corruption (CC) and political stability (PS) have a positive impact on remittance inflows in Bangladesh.

The Bangladesh government should set up arrangements to support Nonresident Bangladeshis to increase the flow of remittances. Also, the government should initiate organizations to help beneficiaries of remittances to utilize these assets and give legal information to remittance workers on the investible chances accessible with the goal that the remittances can be placed into gainful use. Moreover, for a growing economy such as Bangladesh, remittance plays a vital role as an uncommon funding means. It is an alternative source of foreign currency flow to the economy and an alternative source for financing. The remittance can positively influence the exchange rate and improve entrepreneurship development at the same time, if not directed correctly can lead to inflation (Dilanchiev *et al*., 2021). The remittances can go in two directions, either to consumers or to the financing of investment projects. For the policy-maker, it is essential to direct this flow to investment projects only. The remittance inflows increase the savings level at the household and national levels. It also increases the foreign reserve. According to Harrod (1948) and Domar (1947), savings of a nation raise the level of capital stock where raising capital increases the level of investment. This study found that, a positive association between education and remittance inflows which means the schooling facilities raise the remittance inflows. The educated workers are more effective than uneducated workers in case of work efficiency and money transfer through formal channels. Exchange rate volatility increases the risk of money transfer and reduces the volume of transferable money due to currency depreciation. If the authority makes the exchange rate less volatile, the remittance inflows will be raised at a sustainable pattern. In that case, remittance can contribute positively to the sustainable development of the economy. Besides, the policy-makers should secure a suitable environment in destination countries and increase the domestic market interest rate to encourage workers to send more remittances.

## 6. Limitation and Further Research

This study used non-economic determinants like control of corruption, government effectiveness, and political stability but other important factors may influence the inflow of

remittances. Future studies should consider those factors like institutional quality, responsiveness, the voice of accountability, and the role of law to determine the remittance inflows into Bangladesh.

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