



The Impact of Remittances on Food Inflation in Bangladesh: An ARDL Approach

Ashiqur Rahman¹, Afroza Akter Sumi² & Md Nazmus Sadekin³

^{1,2,3}*Department of Economics, Mawlana Bhashani Science and Technology University, Santosh, Tangail-1902, Bangladesh.*

Corresponding Author: Ashiqur Rahman, **Email:** ashiquur005@mbstu.ac.bd

Received: 15th May 2024

Accepted: 16th July 2024

Published: 5th August 2024

ABSTRACT

Purpose of the study: This study aims to investigate how Bangladesh's food inflation is affected by remittance influx.

Methodology: The analysis utilizes secondary data collected from 2005 to 2022. In order to accomplish the goals, this study employs the food inflation rate as an endogenous variable, while workers' remittance, official exchange rate, and broad money supply are used as exogenous factors. The data is sourced from the World Development Index (WDI). In this investigation, co-integration is assessed using the Autoregressive Distributed Lag (ARDL) model to provide an accurate outcome.

Findings: The study's findings show that, both in the short and long term, the influx of remittances from migrants has a positive and considerable impact on driving up food inflation. This analysis shows that while having a negative short-term impact, the money supply and exchange rate have a long-term, positive, and considerable influence on food inflation.

Application of the Study: This research proposes that promoting agricultural output and motivating recipients of remittances to invest in income-generating activities can effectively reduce their reliance on food consumption. If these recommendations are effectively followed, the inflow of workers' remittances will have a positive impact on the economy and contribute to reducing inflationary challenges.

Originality of the study: By employing the most recent data set and cutting-edge methodology, the present research adds to the body of available research by demonstrating a link between food inflation and remittances.

Keywords: Food Inflation, Exchange Rate, Remittances, ARDL, Co-integration.

INTRODUCTION

Remittances from abroad are a major factor in developing countries' economic growth. Bangladesh is a developing country that faces major economic shifts as a result of factors like a large remittance influx, FDI, the ready-made garment (RMG) sector, pharmaceuticals, and other exogenous variables. Remittances are vital to the country's economy and play a significant role in fueling its development. As the main source of foreign reserve for developing nations like Bangladesh, remittances play an indispensable part. Additional benefits of remittances include the absence of future repayment responsibilities, unlike capital transfers, and the recipient countries' lack of requirements to achieve particular political and economic standards, unlike foreign aid. Moreover, the government receives foreign aids as a form of public support, whereas households receive remittances as a form of private assistance. The government's expenditure patterns diverge considerably from those of private households. Although the government dedicates a significant portion of its budget to development initiatives, households mostly allocate their funds towards spending, which subsequently impacts the consumer price index (CPI). Multiple studies indicate that a substantial increase in remittances can significantly diminish poverty and promote economic expansion. Research suggests that remittances can potentially induce inflation in recipient economies (Roy, 2014). Remittance inflows have a substantial impact on the economic development and prosperity of the receiving nation. In 2018, developing nations received a total of \$528 billion, accounting for 76.6 percent of the total remittances earned that year (World Bank [WB], 2018). Remittances yield numerous positive impacts on the economy, although they also include notable disadvantages and contribute to macroeconomic volatility. The relationship between inflation and remittances is theoretically significant, but it is indirect. The impact of remittances on inflation may become more significant as time passes (Narayan et al., 2011). Remittances are a significant source of financial support for impoverished nations (Khatun et al., 2016).

The COVID-19 outbreak slowed down immigration around the world by 27%. Also, because of travel restrictions, job losses, and growing health issues, many migrant workers were unable to send money back to their families in their home countries as remittances. But things quickly changed for the better over the next two years. The remittances sent globally reached an approximate sum of \$781 billion in 2021 and then increased to \$794 billion in 2022. The remittances to low- and middle-income countries (LMICs) experienced a growth rate of approximately 3.8% in 2023, which was lower than the substantial increases observed in the

previous two years. Remittances from the United States remained the main source. With \$125 billion in remittances received in 2023, India ranked first, followed by Mexico (\$67 billion), China (\$50 billion), the Philippines (\$40 billion), and Egypt \$24 billion. In the economies of Tajikistan, Tonga, Samoa, Lebanon, and Nicaragua, remittance income accounts for a sizeable share of GDP (gross domestic product). This emphasizes how crucial remittances are for covering current account and budgetary deficits. The remittances to the East Asia and Pacific region experienced a 3% increase in 2023, reaching a cumulative amount of \$133 billion. Excluding China, the region experienced an almost 7% growth in remittances, totaling \$83 billion in 2023. The expansion was propelled by the persistent rise in remittance flows to the Philippines, which is advantageous due to its large number of migrants residing in various host regions across the globe.

It is anticipated that remittances to Sub-Saharan Africa will rise by 1.9% in 2023, totaling \$54 billion. Significant increases in remittances to Mozambique (48.5%), Rwanda (16.8%), and Ethiopia (16%) are responsible for the increase. Nigeria, with a growth rate of about 2%, accounted for 38% of the remittance inflows into the region. Two other notable recipients, Ghana and Kenya, are predicted to expand at rates of 5.6% and 3.8%, respectively.

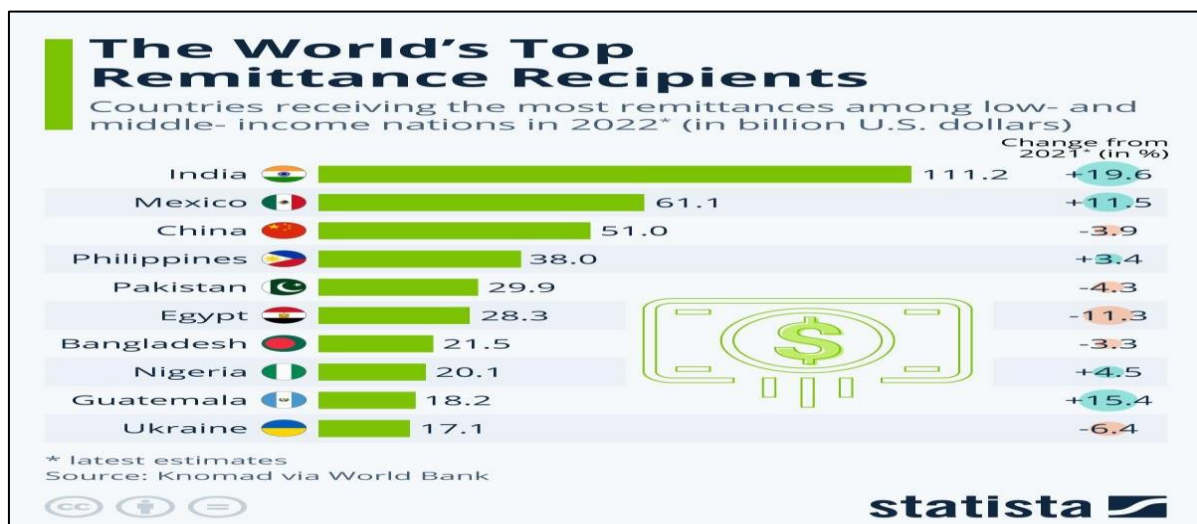


Figure 1: Top 10 remittance receiving countries in 2022.
Source: World Bank

Remittances play a crucial role in Bangladesh's economy as they are the second-largest contributor of foreign reserves. Between January and March 2023, remittances to Bangladesh from overseas residents experienced a 14.97% growth. The increase in prices, which has raised

concerns among people worldwide, can be attributed to expatriates repatriating larger sums of money to their home country in anticipation of Ramadan and other significant occasions.

From July to March of FY'23, a total of USD 16035.08 million in payments were received, which is 4.82% more than the USD 15298.26 million received during the same time period in FY'22. Due to the COVID-19 pandemic, remittances dropped a lot in FY'22. They are expected to rise again this fiscal year and make bigger inputs to GDP, exports, and imports. The World Bank predicts that remittances to Bangladesh will reach \$23 billion in 2023, with growth remaining flat the following year (WB, 2019). According to figures from the Bureau of Manpower, Employment, and Training, the government has dispatched a whopping 12.46 lakh workers overseas on December 11, 2023, above the previous year's number of 11.35 lakh. While the labor export industry has grown significantly, remittance inflows have stayed flat for the previous two calendar years, hovering around the \$22-billion mark.

According to data provided by Bangladesh Bank and reported by BSS, remittances to Bangladesh totaled \$21,610.66 million in FY23, an increase of 2.75 percent over the previous fiscal year when the country received \$21,031.68 million. In fiscal year 2023, the state-owned banks made up \$3,399.19 million of the total remittances.

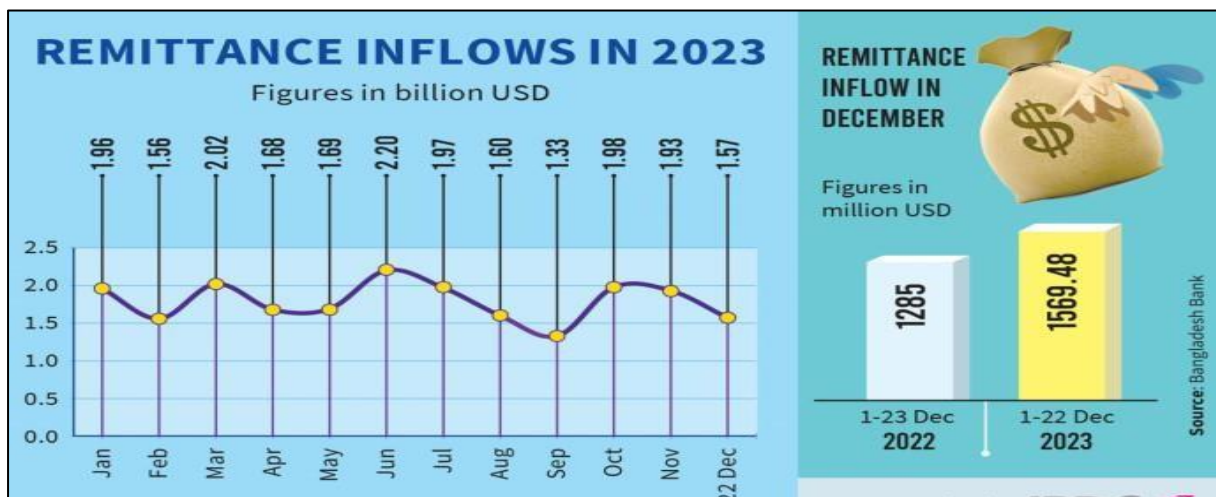


Figure 2: Remittance inflow in Bangladesh in FY 2023.
Source: Bangladesh Bank

Bangladesh is severely affected by the ongoing surge in food inflation. The escalating rate of food inflation has emerged as a significant cause for concern in Bangladesh in recent years. Bangladesh has been classified by the Food and Agriculture Organization (FAO) as one of the thirty-seven countries experiencing a crisis caused by the increase in food prices. The costs of necessary goods have increased, resulting in a corresponding rise in the expense of living. The

nation's extensive population of impoverished and jobless individuals is facing significant challenges in maintaining their livelihoods. Bangladesh is predominantly an agrarian nation. Approximately 48% of the population relies on agriculture as their primary source of income, while over 80% are indirectly dependent on this sector. Bangladesh remains a developing nation. The percentage of people living below the \$1 per day poverty threshold is about 43%. The sector that receives the most subsidies is agriculture. Because of this, marginalized people face severe difficulty because the average household in the country spends almost two-thirds of its income on food. Growing costs force people to cut back on the quantity or quality of their food and alter the way they consume it.

When compared to the same month the previous year, food prices in Bangladesh increased by 10.76% in November 2023. Bangladesh saw a mean food inflation rate of 6.72% between 2013 and 2023. It peaked in October 2023 at 12.56%, and it fell as low as 3.77% in February 2016.

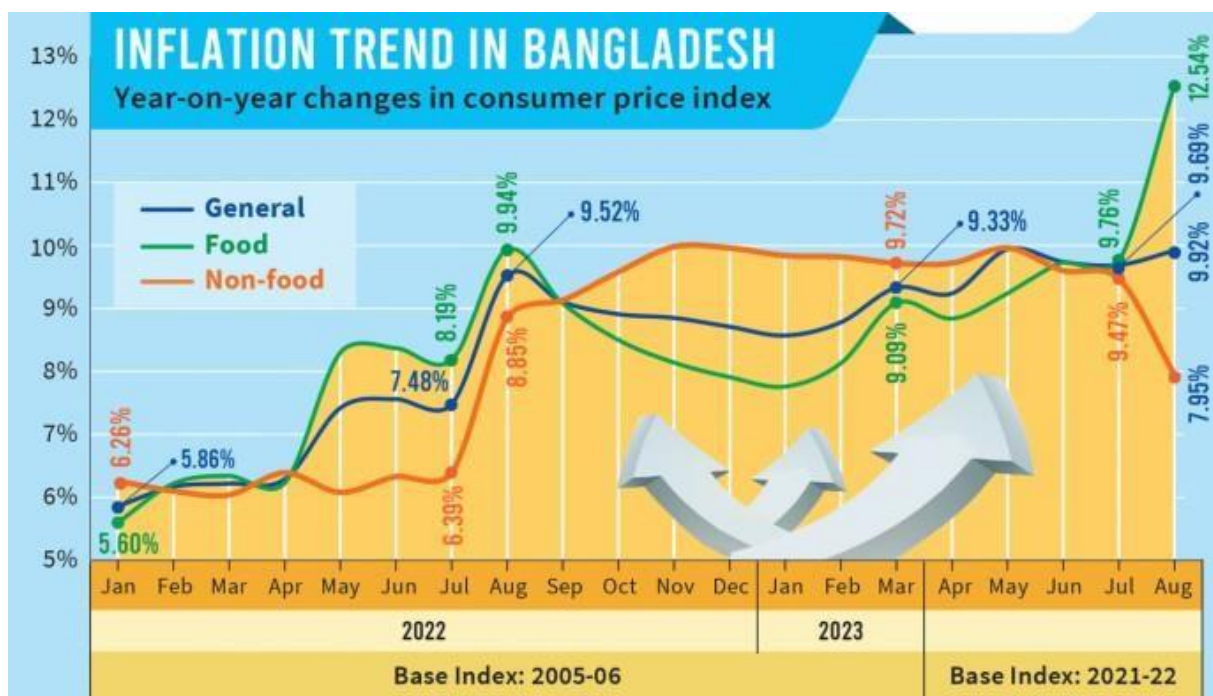


Figure 3: Inflation trend in Bangladesh in FY 2022-2023.
Source: Bangladesh Bureau of Statistics

In FY 2010-11, Bangladesh experienced inflation higher than the current level of August, reaching 14.11%. The recently released data from the Bangladesh Bureau of Statistics shows a marginal increase in the overall inflation rate, rising from 9.69% to 9.92% in July. This implies that prices for a wider range of goods and services, beyond simply food, have also shown an upward tendency.

This study identifies particular questions through an analysis of the problem description mentioned above. The following is the research inquiry of this study:

What is the effect of remittances on food inflation in Bangladesh?

As a result, the study has established the following objective:

- (a) To identify the relationship between remittance and food inflation.
- (b) To estimate the effect of remittance on food inflation in Bangladesh.

The money that workers send back to their home countries has become an important problem for Bangladesh's fiscal and monetary policy. People who leave their home country send money back to help their families who still live there. These flows also help the country that receives them by reducing poverty, funding investments, and making money through foreign exchange. On the other hand, remittances, like other types of cash inflows, can cause food prices to rise in the country that receives them. This study has tried to find out if workers' remittances cause food prices to rise in Bangladesh, especially since the country switched to a floating exchange rate system in 2003. The following piece of research will assist in comprehending the many impacts that remittances have on the economy of Bangladesh and in formulating strategies to optimize the advantages of these financial transfers.

LITERATURE REVIEW

This study aims to examine the influence of remittances on Bangladesh's food price inflation rate. This section provides a brief framework that emphasizes the pertinent studies that are related to this topic.

Between 2001 and 2007, Roy (2014) studied how incoming capital affected local pricing levels, monetary growth, and exchange rate volatility in Pakistan. Granger causality tests and linear and nonlinear co-integration analysis demonstrated that capital inflows significantly influenced inflation, leading to price increases. Remittances' effect on Pakistan's multiple kinds of inflation is explored by Nisar and Tufail (2013). The researchers reviewed the data from 1970 to 2010 using several co-integration techniques. According to the study, remittances have an ameliorating impact on the rising cost of food. Kim and Yang (2008) investigated the reasons behind the positive correlation between an upsurge in capital inflows and the subsequent rise in asset prices, including stock prices and land prices, as a proportion of trend GDP. Through

the utilization of a VAR model, it was shown that capital inflows have indeed played a role in the rise of asset prices in the growing East Asian economies. However, the impact of capital inflow shocks on asset price variations is very minor.

According to Sutradhar (2020), remittances have a negative impact on the economic growth of Bangladesh, Pakistan, and Sri Lanka. Time series analysis was employed by Datta and Sarkar (2014) in their study to look into how remittances affected Bangladesh's economic expansion. Notable discoveries from their study clarified the connection between these two factors. According to Sridhar and Sanjaya (2017), who conducted a research study in Nepal, there was variation in multiple categories of consumables, suggesting that the rise in remittances had a notable effect on domestic relative prices. Using data from 1976 to 2019, Elahi and Rahman (2021) estimated the relationship between inflation and remittances in Bangladesh using the ARDL model. In the short term, remittances were found to have a considerable and favorable influence on inflation, but their long-term effects were negligible. Remittances and inflation do not correlate since any shock to inflation is absorbed in the short-term, claim Rivera and Tuallo (2020). Glytsos and Katseli (1989) demonstrates that there is a consistent pattern of volatility and uncertainty in the country's performance, characterized by significant swings in the effects of remittances over time and across different countries. The findings indicate that countries have varying priorities when it comes to how they spend remittances, and that changes in remittance levels have an unequal impact on economic growth. Specifically, the positive effect of increasing remittances on growth is not as significant as the negative effect of decreasing remittances.

Remittances and institutional factors' short- and long-term effects on inflation were examined by Narayan et al. (2011). A panel of 54 developing nations from 1995 to 2004 was used for the analysis. Researchers found that remittances promote inflation in underdeveloped nations, with a higher impact becoming apparent over time. The study conducted by Termos et al. (2013) examined how the Gulf Cooperation Council's (GCC) member nations' inflation rates were affected by remittance outflows. The empirical research showed that the GCC countries' inflationary pressures are lessened by remittance outflows. Additionally, their findings demonstrate the stabilizing effect of remittance outflows from the examined nations. Ball et al. (2013) investigated the impact of remittances on inflation using panel vector auto regression techniques and quarterly figures for 21 emerging nations. According to their mathematical model, under a fixed exchange rate regime, remittances will temporarily boost the supply of

local currency and inflation, but under an exchange rate system that is flexible, they will temporarily have no effect on the money supply, reduce inflation, and increase the real exchange rate. Khurshid et al. (2016) studied the impact of remittances on inflation within 58 countries belonging to the low-income, lower-middle-income, and middle-income categories using the System Generalized Method of Moments (SGMM) and bootstrap panel Granger causality approach. The SGMM approach's findings demonstrate that while remittances have a beneficial influence on inflation in middle-income nations, they have a statistically significant negative impact on inflation in low- and lower-middle-income countries. Moreover, only low- and lower-middle-income groups experience inflationary conditions as a result of remittances used for savings and consumption. The Granger test results for the bootstrap panel demonstrate that remittances have a significant effect on pricing in lower middle-income nations.

Sbia and Hamdi (2020) looked into how remittance outflow contributed to inflation for a group of 14 OPEC nations from 1980 to 2010. The empirical findings of the bias-corrected least-squares dummy variable estimator show that current account deficits and trade openness have an upsurge on inflation rate, but remittance outflows have zero impact at all. The effect of remittances on food inflation was evaluated by Khatun et al. (2016), with consideration of the regime change effect. The investigation examined post-floating exchange rate data for each month from July 2003 to July 2013, as the exchange rate is dependent on the exchange rate regime. The VECM system was used to assess the relationship's direction, size, and significance. The findings indicate that food prices in Bangladesh are under pressure to rise due to remittance inflows. Based on the findings of the previous studies, it appears that there is a research gap and potential for further investigation into the connection between food inflation and remittance inflows, particularly in Bangladesh. Plenty of research is available regarding inflation and remittance nexus but there is lack of quality study on nexus between food inflation and remittance. This study is going to fill this gap with most recent dataset and advanced methodologies.

DATA AND METHODOLOGY

Data Sources and Types

The dataset is made up of yearly time series data spanning from 2005 to 2022. This study's data originates from a variety of sources, as stated in Table 1.

Table 1: Data Description

Name of Variable	Types of Variable	Abbreviation	Sources of Data	Time Period
Food Inflation	Dependent Variable	FI	WDI	2005-2022
Workers Remittances	Independent Variable	REM	WDI	2005-2022
Exchange Rate	Independent Variable	ER	WDI	2005-2022
Money Supply	Independent Variable	M2	WDI	2005-20022

Model Specification

Empirical Framework

To study the impact of remittances on food inflation in Bangladesh for both short and long run, this paper has used the ARDL co-integration bound test method. We have defined the model as follows:

$$FI = f (REM, ER, M2) \text{-----}1$$

By taking the natural logarithm of the model, we can write the equation in econometrics form as:

$$\ln FI_t = \beta_0 + \beta_1 \ln REM_t + \beta_2 \ln ER_t + \beta_3 \ln M2_t + \epsilon_t \text{-----}2$$

Where, lnFI, lnREM, lnER and lnM2 are the natural logarithm of food inflation, workers’ remittance, exchange rate and money supply respectively. β_0 = Intercept term and $\beta_1, \beta_2, \beta_3$ = Partial regression coefficient. ϵ is the Stochastic error term.

ARDL Bound Test for Co-integration

Autoregressive Distributed Lag (ARDL) models are often used with a single equation to look at how time series data changes over time. Both the autoregressive and distributed lag parts can affect the regressands current value based on how it has changed in the past. Through F-statistics, we can find the long-term link between factors. This way of figuring out co-integration works better. We use bound testing of co-integration and ARDL in this study to look at how the endogenous and explanatory factors are connected. The equation for Bound test is

$$\Delta \ln FI_t = \beta_0 + \beta_{1i} \sum_{i=1}^q \Delta \ln REM_{t-i} + \beta_{2i} \sum_{i=1}^q \Delta \ln ER_{t-i} + \beta_{3i} \sum_{i=1}^q \Delta \ln M2_{t-i} + \alpha_1 \ln REM_{t-1} + \alpha_2 \ln ER_{t-1} + \alpha_3 \ln M2_{t-1} + \epsilon_t \quad \text{-----(3)}$$

The intercept term is β_0 , while the disturbance term is ϵ . And Δ denotes the difference operator for the lagged values of the variables, and q is the model's optimal delays. Equation (3) estimates both the short as well as the long term relationships in a single equation, with β representing the short term and α representing the long term link between variables.

The upper and lower bounds are respectively established under the assumptions that all variables are integrated of order 1 and 0 that is $I(0)$ and $I(1)$. There isn't a long-term link present if the calculated F-value is less than the lower limits. As a result, the null hypothesis would not be rejected and would continue to be accepted. On the other hand, co-integration is present if the F-statistic is greater than the higher cutoff. Refuting the null hypothesis is possible. However, the test's results can be deemed inconclusive if the computed F-value lie within the range indicated by the higher and lower boundaries. Assuming that the F- bound test leads to the conclusion of co-integration, we can determine the long-run relationship from the following equation:

$$\Delta \ln FI = \alpha_0 + \alpha_1 \ln REM_{t-1} + \alpha_2 \ln ER_{t-1} + \alpha_3 \ln M2_{t-1} + \epsilon_t \quad \text{-----4}$$

And the short-run equation implies

$$\Delta \ln FI_t = \beta_0 + \beta_{1i} \sum_{i=1}^q \Delta \ln REM_{t-i} + \beta_{2i} \sum_{i=1}^q \Delta \ln ER_{t-i} + \beta_{3i} \sum_{i=1}^q \Delta \ln M2_{t-i} + \varphi ECM_{t-i} + \epsilon_t \quad \text{-----5}$$

Where, φ is the error-correction coefficient. The ECM indicates the short-term coefficient without losing long-run information.

RESULT ANALYSIS AND DISCUSSION

Unit Root Test

Unit root tests are used to evaluate the stationarity of variables in a time series analysis. In the field of time series analysis, a variable is deemed stationary if it demonstrates no temporal fluctuations.

This study utilizes the Augmented Dickey-Fuller (ADF) test to evaluate the stationarity prior to perform the ARDL Bound test. The presence of a unit root characterizes the null hypothesis. According to the alternative hypothesis, there is stationarity in the time series. The ARDL method allows for the examination of stationarity after the variable has undergone initial differencing, particularly when the variable is nonstationary in its original form. Variables that

demonstrate first-order integration are represented as I (1), while variables that remain constant at a certain level are represented as I (0). The results of our inquiry on the presence of a unit root are presented in Table 2.

Table 2: *Result of the unit root test*

ADF Unit root test				
Variables	Level		First difference	
	Trend & intercept	Decision	Trend & intercept	Decision
lnFI	-3.778***	I(0)		
lnREM	-2.783***	I(0)		
lnER	-0.140	I(1)	-3.597**	I(0)
lnM2	-2.323	I(1)	-5.645***	I(0)

N.B: *, ** and *** resemble the 10%, 5% and 1% level of significance respectively.

In table 2, lnFI and lnREM are stationary at level, but the lnER and lnM2 are not stationary at level. However, the first difference of the variable exchange rate (ER) and money supply (M2) are stationary. The variables pose a mixed order of integration.

Optimal Lag Selection

The selection of the optimal lag order is the second stage in estimating the connection between the two sets of variables once the stationarity requirement has been met. The Akaike information criterion (AIC) is used to determine the right latency to achieve the goals.

Table 3: *Results of Optimal Lag Selection Criteria*

Lag	LogL	LR	FPE	AIC	SBC	HQ
0	6.27129	NA	.044558	-.283911	-.090764*	-.27402
1	6.62467	.70676	.048834	-.203083	.038351	-.19072
2	8.63128	4.0132*	.043791*	-.32891*	-.039189	.314074*

The ideal lag is determined by the outcome displayed in table 3. The optimal lag order suggested by AIC is 2. The model's selected lag order is ARDL (1, 0, 1, 0). Thus, for the variables of interest, the ideal lag lengths are 1, 0, 1, and 0, respectively.

ARDL Bound Test for Co-integration

Now it is time to perform the bound test for co-integration following Pesaran et al. (2001).

The result of the bound test for cointegration is presented in the following table.

Table 4: Bound testing result to cointegration [based on AIC]

Test Statistic	Value	Significance	I (0)	I (1)
F-statistic	7.127	10%	2.37	3.2
		5%	2.79	3.67
		2.5%	3.15	4.08
K	3	1%	3.65	4.66

Null: no levels relationship

The F-test yields a result of 7.127. At the 1% level of significance, the computed F-statistic exceeded the upper bound mark, I (1). Therefore, the null hypothesis—which states that there is no co-integration among variables—may be rejected. There may be a long-term relationship between the explanatory and endogenous variables in the model, according to the F-bound test.

Long run Analysis

From section 4.2.3, it is clear that co-integration is present among variables. So we can estimate the long-run relationship through ARDL (1 0 1 0)

Table 5: Long-Run Relationship Estimation

Dependent variable: lnFI			
Regressor	Coefficient	t-statistic	P-value
lnREM	0.481418	3.614551	0.000***
lnER	0.057686	1.707559	0.051**
lnM2	0.419537	2.069710	0.063*
R-square=0.7298			
Adjusted R-square=0.6070			
N.B: *, ** and *** indicates 10%, 5% and 1% level of significance respectively.			

The result illustrates that the independent variables can explain 72% of variations of the dependent variables. The independent variables lnREM, lnER, and lnM2 are clearly significant at the 1%, 5%, and 10% levels of significance, respectively, based on the p-statistics. The model's output indicates that there is a positive correlation between workers' remittances and food inflation. A 1% increase in worker remittance inflow would result in a 0.48 percent increase in food inflation. Given that the exchange rate's coefficient is 0.057686, the exchange rate positively affects the dependent variable as well. Over an extended period, a 1% rise in the

exchange rate results in an approximate 0.05% increase in the dependant variable. Food inflation is positively impacted by the money supply as well. When the money supply increases by 1%, the Food Inflation increases by about 0.41%.

Short-Run Analysis

Now it is time to move to explore the short-term relationship among variables.

Table 6: Short-Run Estimation

Variables	Coefficient	Std. error	t-statistics	p-value
lnREM	0.075040	0.291647	2.572985	0.0259**
lnER(-1)	-1.648650	0.854221	-1.930004	0.0798*
LnM2	-0.653947	0.277826	-2.353802	0.0382**
ECM(-1)*	-1.558734	0.351694	-4.432072	0.0010***
Cons.	10.37099	4.296288	2.413941	0.0344**

N.B. (***), (**), (*) denotes significant at 1%, 5% and 10% respectively.

The ECM (-1) term exhibits the necessary negative quality and is resilient and meaningful at 1%, according to the short-run study results. In the current situation, the annual rate of adjustment from a state of disequilibrium to stable equilibrium is 55.8%, as indicated by the value of ECM (-1). This rate of adjustment is more rapid and robust. The aforementioned table makes it evident that worker remittances have a major positive short-term impact on food inflation, while the money supply and a one-period lag in the value of the exchange rate have a considerable negative short-term impact.

Diagnostic Tests

Several diagnostic procedures are carried out here to verify the model's fitness and stability. The Durbin-Watson and Breusch-Godfrey tests for autocorrelation, the Breusch-Pagan and White tests for heteroscedasticity, the Jarque-Bera normality test, and the Cumulative Sum Square (CUSUM square) test for stability are all performed in this study.

Test of Serial correlation

To check the auto correlation in the model, we perform the Durbin-Watson Test and the Breusch-Godfrey Test.

(a) Durbin-Watson test:

Table 7: Durbin-Watson d test

	Test score
d-statistic	2.3173

The decision rule for the Durbin-Watson test is that if the test result is 2 or close to 2, there is no serial correlation. From our analysis, the test result is 2.31, which is close to 2. We can conclude that there is no autocorrelation.

(b) Breusch-Godfrey Test:

Table 8: Breusch-Godfrey LM Test

Lags (p)	Chi2	df	Prob>chi2
1	0.834	1	0.3611

The null is no serial correlation. The probability value is greater than 5%, so the null is accepted. Hence the study is free from serial correlation.

Test of Heteroscedasticity

To check whether the residual of variance is homoscedastic or heteroscedastic, Breusch-Pagan-Godfrey test is applied.

Breusch-Pagan-Godfrey Test:

The hypothesis of the test is

H_0 : Constant variance or homoscedastic

H_1 : Heteroscedastic

Table 9: Breusch-Pagan-Godfrey Test

Chi2 (1)	2.35
Prob>chi2	0.1250

The p value is 0.1250, which is greater than 0.05. Null hypothesis can't be rejected, hence there is no heteroscedasticity.

Normality Test

To determine whether the dataset is regularly distributed or not, the Jarque-Bera test is performed.

Jarque-Bera Test for normality:

H_0 : normally distributed

Table 10: Jarque-Bera Test

Jarque-Bera normality test	0.766410
Probability	0.681673

Here, the p-value = 0.681673, which exceeds the critical value of 0.05. Hence the dataset is normally distributed.

Test of model specification

Ramsey RESET Test:

A general test of model specificity for linear regression is the Ramsey's RESET test. It establishes whether non-linear combinations of the explanatory factors, in the explanation of the dependent variable. The hypothesis developed are as follows:

H_0 : linear regression model is not mis-specified

H_1 : linear regression model is mis-specified

Table 11: RESET Test for model identification

	Value	df	prob
F-statistic	3.3175	(1,10)	0.0986

The test result shows that p-value is greater than 0.05 indicating that we cannot reject the null hypothesis. Hence, the model is correctly specified.

Stability Test

We conduct a Cumulative sum of recursive residuals (CUSUM) and the Cumulative sum of recursive residuals of square (CUSUM square) to test the stability of our model. The graphical representation of the CUSUM Test is given in figure 4.

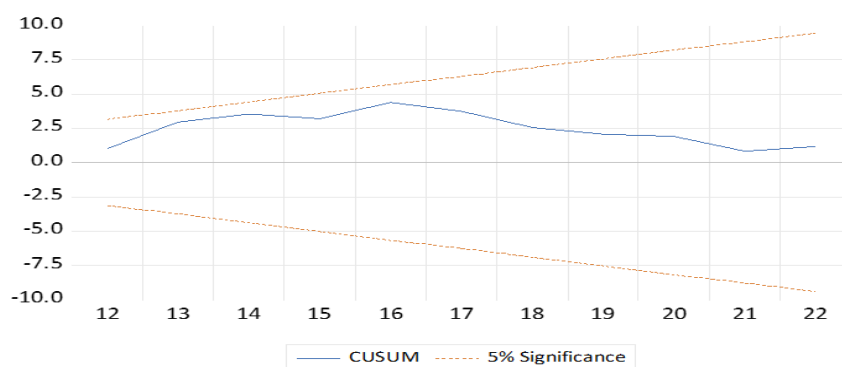


Figure 4: Plot of CUSUM Test

The graphical representation of the CUSUM Square Test is given in figure 5.

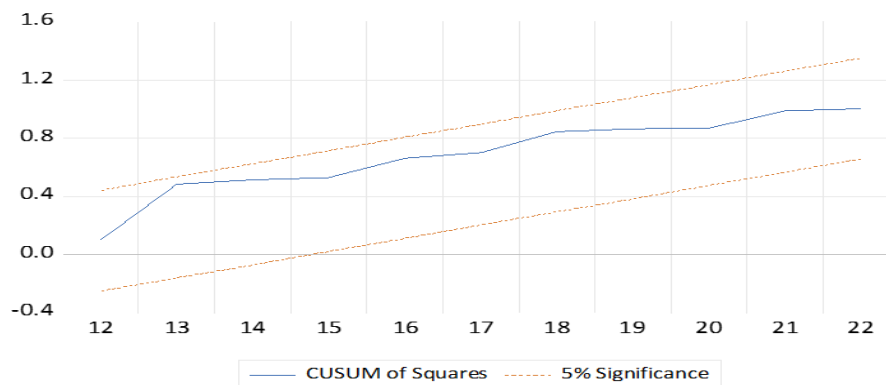


Figure 5: Plot of CUSUM Square Test

Figure 4 and 5 shows that the graphs of the CUSUM and CUSUM square remain within the 5% critical bound. As the plots do not cross the crucial boundaries, the figure demonstrates that the model is stable.

Policy Recommendations

The purpose of this paper is to investigate the impact of workers remittance inflow on food inflation in Bangladesh over the period 2005-2022. The inflow of workers' remittances has become a critical concern for Bangladesh's fiscal and monetary policies. Emigrants transmit remittances to provide financial support to their family residing in their country of origin. These inflows also have a positive impact on the recipient country by reducing poverty and providing financial resources.

This study has utilized the ARDL Bound Test to confirm the long run association-ship between the variables of interest. The main findings of our analysis are:

With an elasticity of 0.48%, the workers' remittance inflow has a long-term beneficial impact on food inflation. In the short term, worker remittances also have a favorable effect on food inflation. Long-term food inflation is positively impacted by the exchange rate as well, with an elasticity of 0.05%. However, in the near term, the exchange rate has a large and negative impact, with an elasticity of 1.64%. In the long run, food inflation is positively and significantly impacted by the money supply. However, the money supply has a large and negative short-term influence; its elasticity is roughly 0.65% in the short term and 0.41% in the long term.

Policy Recommendation:

The majority of country's households have low or lower mid-level of income. Deprived of remittance funds, they face difficulties in fulfilling their dietary requirements. Remittances immediately improve people' purchasing power, leading to a quick rise in their food consumption. As the inflow of remittances keeps growing, households experience an increase in financial stability. Food inflation is expected to have a future influence on other sectors. In order to foster economic growth, governments should redirect remittances from consumption towards investment in productive sectors, given that inflation might have significant effects for welfare. In addition, policymakers should take into account the following recommendations:

a) Promote agricultural productivity and diversification:

By boosting agricultural productivity and expanding the sector's range of activities, it is possible to alleviate the inflationary effects resulting from remittances. Allocating resources towards agricultural research and development, irrigation systems, and rural infrastructure has the potential to increase production and decrease dependence on food imports, hence promoting price stability.

b) Facilitate financial inclusivity and investment:

By motivating recipients of remittances to allocate their funds towards income-generating ventures, their reliance on food expenditures can be diminished. Enabling financial inclusion through the provision of credit, savings accounts, and financial literacy initiatives can empower individuals to establish small enterprises and expand their sources of income.

c) Implement Social Safety nets:

Social safety net policies should be considered by the government to safeguard vulnerable communities against food inflation. These initiatives can help low-income households acquire inexpensive, healthy food during inflation.

LIMITATIONS OF THE STUDY

The study has some limitations. The previous researches were based on monthly data while current work has used yearly data. Aside from food inflation, Bangladesh is affected by other

factors such as worker remittance inflows, exchange rates, and money supply, which are not covered in this study. Furthermore, remittances received through informal routes are not taken into consideration, hence remittance figures may be underreported. Unofficial channels prevail in Bangladesh since they are not only less expensive but also more convenient.

CONCLUSION

This study which uses secondary data from many sources from 2005 to 2022, attempts to capture the impact of remittances on food inflation in Bangladesh. The empirical part of confirming the association is done using ARDL Bound Co-integration test. It is found that worker remittance inflows have a favorable impact on food inflation in Bangladesh. The inflow of remittances has the potential to boost overall demand for food and services, including food goods. This increasing demand may put higher pressure on prices, notably food inflation. However, the impact of remittances on food inflation is complex and varies depending on a number of factors, including exchange rates and money supply. These factors also influence food inflation in Bangladesh.

REFERENCE

- Ball, C. P., Lopez, C., & Reyes, J. (2013). Remittances, inflation and exchange rate regimes in small open economies 1. *The World Economy*, 36(4), 487-507.
- Datta, K., & Sarkar, B. (2014). Relationship between remittances and economic growth in Bangladesh: an Econometric Study. Available at SSRN 2375991.
- Elahi, S. M., & Rahman, M. H. (2021). Remittance and inflation nexus in Bangladesh: application of dynamic ARDL model with linear trend. *Indonesian Journal Of Business And Economics*, 4(2).
- Elahi, S. M., & Rahman, M. H. (2021). Remittance and inflation nexus in Bangladesh: application of dynamic ARDL model with linear trend. *Indonesian Journal Of Business And Economics*, 4(2).
- Katseli, L. T., & Glytsos, N. P. (1989). Theoretical and empirical determinants of international labour mobility: a Greek-German perspective. In *European factor mobility: Trends and consequences* (pp. 95-115). London: Palgrave Macmillan UK.
- Khatun, R., Roy, R., & Rahman, M. M. (2016). Impact of remittances on food prices in Bangladesh. *J Inst Bank Bangladesh*, 62(1-2), 1-23.
- Khurshid, A., Kedong, Y., Calin, A. C., & Popovici, O. C. (2016). Do Remittances Hurt Domestic Prices? New Evidence from Low, Lower-Middle and Middle-Income Groups. *Romanian Journal of Economic Forecasting*, 19(4), 95-114.
- Kim, S., & Yang, D. Y. (2008, May). *The Impact of Capital Inflows on Emerging East Asian Economies: Is Too Much Money Chasing Too Little Good?* (ADB Working Paper Series on Regional Economic Integration, No. 15) <https://www.adb.org/sites/default/files/publication/28472/wp15-impact-capital-inflows.pdf>
- Migration and Development Brief 39. (2023, December). *Remittance Flows Continue to Grow in 2023 Albeit at Slower Pace*. World Bank. <https://www.worldbank.org/en/news/press-release/2023/12/18/remittance-flows-grow-2023-slower-pace-migration-development-brief>
- Narayan, Paresh Kumar, Seema Narayan, and Sagarita Mishra.** 2011. "Do Remittances Induce Inflation? Fresh Evidence from Developing Countries." *Southern Economic Journal*, 77(4): 914-933. <http://dx.doi.org/10.4284/0038-4038-77.4.914>
- Nisar, A., & Tufail, S. (2013). An analysis of relationship between remittances and inflation in Pakistan. *Zagreb International Review of Economics & Business*, 16(2), 19-38.
- Rivera, J. P. R., & Tullao Jr, T. S. (2020). Investigating the link between remittances and inflation: evidence from the Philippines. *South East Asia Research*, 28(3), 301-326.

- Rivera, J. P. R., & Tullao Jr, T. S. (2020). Investigating the link between remittances and inflation: evidence from the Philippines. *South East Asia Research*, 28(3), 301-326.
- Roy, R., & Rahman, M. M. (2014). An empirical analysis of remittance–inflation relationship in Bangladesh: post-floating exchange rate scenario.
- Sbia, R., & Hamdi, H. (2020). Remittances and inflation in OPEC countries: Evidence from bias-corrected least-squares dummy variable (CLSDV) estimator. *Economics Bulletin*, 40(3), 2471-2483.
- Sutradhar, S. R. (2020). The impact of remittances on economic growth in Bangladesh, India, Pakistan and Sri Lanka. *International Journal of Economic Policy Studies*, 14(1), 275-295.
- Termos, A., Naufal, G., & Genc, I. (2013). Remittance outflows and inflation: The case of the GCC countries. *Economics Letters*, 120(1), 45-47.
- Thapa, S., & Acharya, S. (2017). Remittances and household expenditure in Nepal: Evidence from cross-section data. *Economies*, 5(2), 16.
- World Bank Group. (2018, December 8). *Accelerated remittances growth to low- and middle-income countries in 2018* [Press release]. <https://edubirdie.com/blog/how-to-cite-a-press-release-apa>