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# Do Remittances Induce Inflation? A study for Developing Countries

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**Abstract**

The academic literature on the economic impact of workers' remittances has overwhelmingly concentrated on their positive effects on economic growth. This focus is largely because these financial inflows are widely perceived as a vital source for financing capital formation in recipient countries, thereby stimulating investment and national income. As a stable and significant source of foreign currency, remittances are often celebrated for their potential to foster development where traditional capital is scarce.

However, this prevailing narrative often overlooks potential macroeconomic drawbacks. Beyond the beneficial impact on growth, substantial remittance inflows may disrupt the stability of the general price level. By increasing aggregate demand and potentially expanding the money supply, these funds can exert significant upward pressure on domestic prices, leading to higher inflation. This study, therefore, shifts the focus to this less-explored consequence.

The primary objective is to empirically determine the effect of remittances on the inflation rate within the four developing countries that receive the highest volume of such inflows globally. Using a comprehensive dataset spanning the period from 1990 to 2020, the analysis employs three robust panel data methodologies: Fixed Effects (FE), Random Effects (RE), and the one-step system Generalized Method of Moments (GMM). The findings of the study provide compelling evidence for the conclusion that remittances do, in fact, induce a higher inflation rate in the host country, highlighting a critical policy consideration for macroeconomic management



**Keywords:** Remittances, Inflation, Exchange Rate, Panel Data

**JEL Code: F22, F24, F29, F20**

## 1. INTRODUCTİON

Workers' remittances are a kind of source for developing countries to finance equity capital. In addition to this, workers' remittances are more reliable and stable when we compared them to the foreign direct investments (FDI) and foreign aid. Moreover, remittances grow so fast –in last

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decades so that the volume of remittances are now more than total FDI inflows in the world. Since remittances are a source of income for developing countries, they are mostly accepted as important tool for economic growth. In literature, workers' remittances are expected to promote economic growth and higher investments, yet they may cause higher inflation and deter the stability in the inflation rate as well.

The effects of remittances on the inflation rate can be in several ways. First, workers remittances inflows put pressure on the total aggregate consumption and lead to higher inflation. Since receiver of remittances at home country will consume or save the income transferred from outside. If they increase the consumption level as their income increase, this will increase the total aggregate expenditure and create higher inflation in the economy. In other words, aggregate demand will increase, while aggregate supply is constant so that workers remittances inflows will lead to higher inflation in the economy through aggregate demand channel. Second, if workers' remittances are used to finance investments they will again cause higher inflation through aggregate demand channel. However, most of the studies shown that most of the remittances received are devoted to the consumption rather than financing investments since receiver families are poor enough to make expensive investments. Third, workers remittances may create higher inflation by increasing the money supply. As money supply increase, this will decrease the interest rate and then increase investments and in return the aggregate demand will increase while aggregate supply is constant. Fourth, workers' remittances may cause higher inflation by leading appreciation in the host country's currency exchange rate. Remittances inflows will increase the volume of foreign currency in the Central Bank so that as the supply of foreign currency increase, this will lead appreciation in the exchange rate. An appreciation in the exchange rate will increase the purchasing power of consumers and in return may cause increase in the volume of total consumption and again put a pressure on the aggregate expenditure. In other words, host country currency appreciation may create higher inflation by increasing the aggregate expenditure while aggregate supply is constant. Lastly, effect of remittances on inflation may be negative as well. İf remittances inflows are devoted to the saving rather than consumption, this will increase the money supply to finance to equity capital that are used to produce more goods and services in the economy. So that, workers remittances may reduce the inflation rate in the economy unless they are not used to finance consumption.



When we analyze the remittances literature, we figured out that most of the studies have been dealt with the effects of remittances inflows on the economic growth and investments or there are a lot of studies that investigate the determinants of remittances. However, there is almost a handful of study that investigate the effects of remittances inflows on inflation rate. Remittances inflows are good for economic growth but they may also deter the economy by increasing inflation rate in the host country. Therefore, investigation of effect of remittances on inflation rate is essential for the remittances literature. So, the main purpose of this study is to analyze the impact of workers'

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remittances on host country inflation rate for the period 1990-2020. The country group in the analysis is consist of countries that receive the highest remittances inflows in the world. Countries are in the analysis can be counted namely as Pakistan, India, Sri Lanka, Bangladesh.

We help the literature to fill the gap in several ways: We try to predict the effect of workers' remittances on inflation rate by applying Fixed Effect (FE), Random Effect (RE) and One-Step system Generalized Method of Moment (GMM). We apply three panel data estimation method to make sure the robustness of our estimate. Second, we consider the simultaneous correlation among both dependent and independent variables by applying GMM method. Third, we are conducting the study for the countries that receive the highest volume of remittances inflows in the world.

The rest of the paper is organized as follows: After introducing the study, we continue with the second section that give a quick summary of previous studies. After second section, Third section describes data and methodology in the study. Following third section, fourth section explains empirical findings and their implications. Finally, last section gives concluding remarks and summarizes the study.

### 1.2. Country Selection and Rationale

We focus on Pakistan, India, Sri Lanka, and Bangladesh over 1993–2020 because these economies have persistently ranked among the world's top remittance recipients relative to GDP and in absolute terms, ensuring adequate variation and statistical power for identification.



Comparability: The four countries share structural characteristics relevant for the remittances–inflation nexus: sizable diaspora networks, banked and unbanked remittance corridors, partial capital account restrictions, high import shares in the consumption basket, and inflation processes influenced by food and energy prices.

Policy regimes and heterogeneity: While monetary and exchange-rate regimes differ (e.g., managed vs. more flexible arrangements), we address potential heterogeneity via fixed effects and robustness checks (System GMM), which control for time-invariant country characteristics and endogeneity. We also use a common variable construction (e.g., remittances as % of GDP; exchange rate defined as LCU/USD) to improve cross-country comparability.

External validity: The South Asian focus aligns with global remittance corridors (GCC–South Asia, North America–South Asia), making results informative for other lower- and lower-middle income economies with similar import dependence and transmission channels.

Data quality and availability: The World Bank and national statistical offices provide consistent annual series for CPI inflation, remittances (% of GDP), exchange rate (LCU/USD), openness, GDP and investment, minimizing coverage gaps and interpolation bias.

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## 2. LİTERATURE REVİEW

Analysis of literature shows that there is a mixed evidence regarding the effect of workers' remittances on the inflation rate. While most of the researchers concluded that remittances are likely to induce the inflation rate, still some others reported that remittances are likely to reduce the inflation rate. For-example, Narayan et al. (2011) have analyzed the effect of remittances on inflation for developing countries by applying panel data set, they concluded that workers' remittances have a deterring effect on inflation and this effect is larger in the long-run. Moreover, Simmons (2016) has also explained that remittances are likely to deter inflation if remittances are used for consumption. Khan and Islam (2013) has also studied the relationship between workers' remittances and inflation and they concluded that remittances affect the inflation positively in the long-run but there is no relationship between these variables in the short-run. Roy and Rahman (2014) has reached out the similar result with the study of Khan and Islam (2013). Termos et al. (2013) has examined the effect of workers' remittances outflows on the inflation rate and at the end of the study, they concluded that remittances outflows have a reducing effect on the inflation rate.

There is also a handful of study that found that workers' remittances inflows have reducing effect on the inflation rate. Still some others could not find any effect of remittances on the inflation rate. For-example, the study of Rivera and Tullao (2020) has examined the relationship between remittances and inflation, they reached out that inflation is likely to increase the remittances but remittances have no effect on the inflation rate. Furthermore, the studies of Haderi et al. (1999) and Khurshid et al. (2016) have studied the effects of remittances on the inflation rate and differently, they reached out at the end of the study that remittances are likely to reduce inflation rate.



## 3. DATA & METHODOLOGY

### 3.1. Data

Our date set is consist of data points for 4 countries that receive the highest volume of remittances in the world. Our explained (dependent) variable is selected as the inflation rate. Inflation rate is simply calculated by using Consumers Price Index (which is taken from World Bank Data). Our core independent variable is workers' remittances inflows into this 4 country group. We also included other control variables to avoid from specification error in the estimation. Other control variables are Gross Domestic Product (GDP), GDP Growth Rate, Exchange Rate, Investments, and Openness Index. Openness Index simply shows the import plus export values as the GDP percentage. All variables are measured in USA Dollars and gathered from World Bank Data dissemination tool. (www.worldbank.org).

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### 3.2. Methodology

In order to estimate the effect of remittances on the inflation rate, we have obtained balanced panel data sets of 4 countries. Panel data normally allows unobserved factor (in this case it is country specific variable) to be correlated with explanatory variable. General panel data model is known as Fixed Effect (FE). We can start to FE model with a simple general panel data regression model:

$$y_{it} = \beta_1 x_{it1} + \beta_2 x_{it2} + .....\beta_k x_{itk} + a_i + u_{it}, t = 1, 2....., T.$$

In this regression,

$y_{it}$ denotes the dependent variable, while $y\beta_k x_{itk}$ denotes the explanatory variables and $a_i + u_{it}, t$ represent the country specific factor which is not varying with time and error term that varies with panel and time respectively. Normally, Ordinary Least Square (OLS) necessitates that country specific factor $a_i$ should not be correlated with the explanatory variable. Yet, inclusion of $a_i$ makes OLS estimation invalid since $a_i$ will be correlated with explanatory variable. Thus, to avoid from this problem, one can take the first difference of the regression and subtract it from the first regression in order to eliminate $a_i$ . This transformation procedure is known as Fixed Effect (FE). RE simply assumes that $a_i$ is uncorrelated with the explanatory variables and we keep $a_i$ in the regression. Therefore RE gives more precise results since we don't cause to loose information ( $a_i$ ) in the data set. In order to decide between FE and RE, one should carry on Hausman Test (1978). If obtains a statistically significant Hausman test (e.g., p=0.000), this means that both estimator (FE and RE) give similar results and FE should be preferred because RE is inconsistent in this case.



Applying just, panel data estimators (FE and RE) and deciding which superior to other is not enough if we are suspicious about the endogeneity among variables. We know from the macroeconomic theory and literature, while independent variable (workers' remittances) likely to have effect on inflation, dependent variable (inflation) may have effect on the workers' remittances as well. So, to capture two-sided relationship, we need to carry one dynamic panel data model one-step system GMM.

One-step System GMM operates simply as follows:

A dynamic panel model typically can be formulated as

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$$Y_{it} = \delta Y_{it-1} + X'_{it}\beta + u_{it} \qquad (i = 1.....N; t = 1.....,T),$$

If we include the lagged of dependent variable in the regression, we obtain dynamic panel data mode. We could eliminate $a_i$ by applying transformation procedure as we did in the FE, however we cannot eliminate $\delta Y_{it-1}$ which will be still correlated with the explanatory variable. Thus, we apply the Areallano and Bond (1991) estimator which suggest the use of lagged of dependent variable as instrument. By doing so, we get rid of the ( $\delta Y_{it-1}$) lagged of dependent variables correlated with the explanatory variables. However using instruments may cause over-identic action problem among instrument therefore, Arellano and Bond (1991) suggests the Hansen Test statistics. At the end of the estimation Result Table 1, we have provided Hansen Test Results which clarifies that we don't have any over-identification problem among instruments.

## 4. EMPİRİCAL RESULTS

In order to estimate the effect of remittances inflows into 4 countries in the analysis, we have carried on three estimations. We first, carried on FE estimator and we stored the results then we carried on RE estimator and we stored the results. By depending on stored FE and RE, we have carried on Husman Test. We have reported both FE, RE and Hausman Test Statistics in the Table 1. Later on, we carried on one-step system GMM to make sure the robustness of the estimate. We have also reported the results of one-step GMM in Table 1 and its post estimation results at the bottom of column 3.



**Table 1. Estimation Results**

| Variables | Fixed Effect (FE) | Random Effect (RE) | One-Step GMM |
|---|---|---|---|
| **Inflation $_{t-1}$** | — | — | -0.1049<br>(0.000)** |
| **Remittances** | 1.8509<br>(0.000)** | 1.9857<br>(0.000)** | 1.9062<br>(0.000)** |
| **GDP** | -0.0061<br>(0.006)** | -0.0104<br>(0.000)** | -0.0093<br>(0.000)** |
| **GDP Growth** | -0.49674<br>(0.002)** | -0.3011<br>(0.003)** | -0.5150<br>(0.207) |

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| | | | |
|---|---|---|---|
| **Openness** | -0.0228<br>(0.034)* | -0.0532<br>(0.000)** | -0.0356<br>(0.000)** |
| **Investments** | 0.0633<br>(0.568) | 0.0792<br>(0.474) | 0.1478<br>(0.033)* |
| **Exchange Rate** | -0.004<br>(0.681) | -0.0019<br>(0.063) | -0.0009<br>(0.038)* |
| **F (6, 896)**<br>**Probility>F** | 5.63<br>(0.000)** | 52.14<br>(0.000)** | |
| **Husman Test** | **77.99**<br>**(0.000)**** | **77.99**<br>**(0.000)**** | |
| **Wald $Ch^2$ Test**<br>**Prob>$Ch^2$** | — | — | **193.65**<br>**(0.000)**** |
| **AR (2) Test** | — | — | **0.101** |
| **Hansen Test** | — | — | **0.942** |



As one can see from Table 1, we reject the Hausman Test Statistics with the probability of p = 0.000. Therefore, we can simply suggest that FE and RE results favor FE over RE; RE is inconsistent when the Hausman test is significant.

Clearly seen that both sign and magnitude of coefficients in the RE and FE give similar results. Thus, we will report the results of RE estimations which include more information in data. Furthermore, in order to make sure the robustness of estimate, we considered the two-sided relation between inflation and remittances, so that we have carried on one-step GMM estimator. As seen from Table, GMM results are similar to RE results for the main independent variable (remittances) in the regression though it may differ for some variables in the regression. This study will report the both RE and one-step System GMM results, as of our estimation results.

According to both RE and GMM results, workers' remittances affect the inflation positively. In other words, workers remittances inflows seem to increase the inflation rate in this country group. As noted earlier, if receiving families of remittances use these remittances for consumption rather than saving, remittances inflows will increase the consumption level in the country and increase the total aggregate demand while aggregate supply is constant. Thus, higher remittances will create

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higher inflation rate. Furthermore, when we look at the results of other control variables; we see that, according to both RE and GMM results, both GDP and Openness Index variables have a negative effect on the inflation rate. In other saying, higher GDP and Openness index have a reducing effect on the inflation rate. Higher GDP means higher goods and services produced with in the country. In other words, higher GDP mean an increase in the aggregate supply. Thus, while aggregate demand is constant, an increase in the aggregate supply will make pressure on the prices to decline. Moreover, higher openness index means that countries involvement in the export and import operations higher. Thus, as the counties engage in the external trade, they can import more goods and services which in then increase the aggregate supply while aggregate demand is constant. Higher imports will increase the goods and services in the country and will make downward pressure on the prices of goods and services.

Furthermore, GDP growth is negative in some specifications, but in GMM it is statistically insignificant (p=0.207), so we refrain from economic interpretation, while according to the GMM, both investments and exchange rate is negative given LCU/USD definition; higher value implies depreciation, which can reduce inflation via expenditure switching with the inflation rate. These results are also worthy to take note. Since GDP growth means higher goods and services produces with in the country, we can again pursue that higher growth rate will increase the aggregate supply while aggregate demand is constant thus have a negative effect on the inflation rate. Moreover, higher investments levels remind us that firms will likely to increase their capacity with the higher investments and likely to produce more goods and services while aggregate demand is constant. So, higher investments as a nature of fact, will put downward pressure on the general price level in the economy by increasing the supply of goods and services. Moreover, an increase in the exchange rate means appreciation of host currency. As the currency appreciates, households will hold more currency in hand and will demand for more imported goods and services which in turn likely to decline the inflation rate. Moreover, both estimation results clearly unable to prove any effect of other control variables on the inflation rate.



## 5. CONCLUDİNG REMARKS AND SUMMARY

Scholars overwhelmingly have analyzed the effect of workers' remittances on economic growth since remittances are perceived as the source of financing the capital in the receiving county. However, beside the positive effect of remittances on economic growth, they may deter the stability of the general price level and may cause higher inflation. Therefore, we aimed to find the effect of remittances on inflation rate in 4 developing countries that receive the highest volume of remittances inflows in the world for the period 1990-2020. To do so, we have applied three panel data methods (FE, RE and one-step system GMM).

At the end of the study, we clearly proved by depending on three panel data estimators that workers' remittances have a strong positive effect on the inflation rate in this country group. With respect to

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the control variables, we have also proved that GDP, GDP growth, Investments, Exchange Rate and Openness Index variables mostly reduce inflation, though not all effects are statistically significant across models. Our policy implication to policy makers are worthy to note: Even though remittances are good for the economic growth and well-being of the society, they may deter the stability of inflation unless remittances are not used for saving. Thus, policy makers should find the ways to make receiving families to devote remittances to saving rather than consumption. If remittances are devoted to saving, this will both increase the economic growth and have a reducing effect on the inflation rate. In other words, policy makers may promote new incentives or implications (laws) to increase the saving that are financed by the remittances, or financial literacy education can be provided to raise awareness among savers. In addition, various entrepreneurial awareness programs can be provided to enable these savers to become entrepreneurs

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