

## Revisiting the Impacts of Remittances and Economic Growth on Financial Development in Selected South Asian Countries: Evidence from Panel Data Analysis

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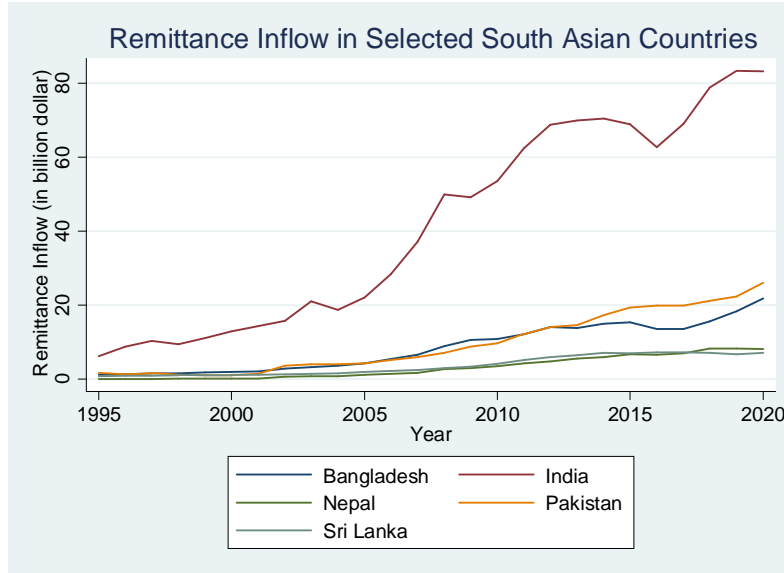
**Abstract:** Expatriate income has become one of the major driving forces of the economy in many developing countries. This study investigates the role of remittances and economic growth on financial development for five highest remittance recipient economies in South Asia for the period of 1995 to 2020. Results from panel-data estimation techniques exhibit a positive relation between remittance and financial development in these countries. The results from Granger-causality tests suggest that remittance plays a catalyst role to bring financial development but financial development doesn't play any role to bring remittance while Dumitrescu Hurlin Causality tests found a bi-directional relationship. The findings of the study are significant for all the selected countries. The study suggests that the inflow of remittances may be increased through the improving institutional set-ups, which may lead to the financial development in the selected countries of the study.

### I. Introduction

Recently, the inflow of workers' remittances have increased significantly in Asia, Latin America, Africa and the Pacific region which help boosting the development of financial sector and economic growth in these regions. In South Asia, the trend of remittance flow shows a gradual increment for selected countries over a period of 1995 to 2020 (Figure 1). While remittance is the most important external root of funding specially for developing countries, (Sutradhar, 2020; Bhattacharya, Inekwe and Paramati, 2018; Straubhaar and

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**Figure 1: Remittance Inflow in Selected South Asian Countries**

*Source:* World Development Indicator

Vādean, 2006) found the effect of remittance on economic growth show mixed results (Barjaba, 2021; Sutradhar, 2020).

Studies support that the contributions of remittance to nation's economic growth is enormous through different channels. Remittance investment directly and indirectly contributes through capital formations to specially migrated individuals and his family by promoting economic growth (Goschin, 2014).

Sutradhar (2020) found the negative relationship between remittance and economic growth in some selected South Asian countries. However, the general view is that remittance treated as a direct earnings of home country's families which further works as multiplier effect through consumption, production and employment generation. Consequently, the raising employment further induces the consumption demand and capital formation to accelerate the economic growth (Donou-Adonsou, Pradhan and Basnet, 2020; Lowell, de la Garza and Hogg, 2000).

Study on remittance and economic growth shows mixed results that is ranging positive to negative and in some cases zero relation. With larger immigrant or international migration, the effect of larger remittance on countries domestic production or output increases at a level after that it decreases (Mamun,

Sohag, Uddin and Shahbaz, 2015). Economic growth positively affected by remittance and negatively affected volatility of remittance found by the study of Imai *et al.*, 2014. By analyzing panel data of 6 high remittance recipient countries from 1999 to 2013 stated that a positive relationship exists in economic growth and remittance. There is a long run positive relationship between remittance and economic growth (Meyer and Shera, 2016). In case of labor exporting countries by using ARDL model, Jayaraman, Choong and Kumar (2012) found the positive correlation between remittance and economic growth variables.

Beside the positive relationship between remittance and economic growth, remittance is not benefit-driven and the relationship between remittance and economic growth is no more positive, and there exists an inverse relationship (Giuliano and Ruiz-Arranz, 2009). Using panel co-integration test on “Caribbean community and common market (CARICOM)” found the inverse relationship between those variables in the long run that is remittance not used for productive activities. There is no significant relationship between remittance and economic growth (Lim and Simmons, 2015).

Likewise, the debate on how financial development and remittances are associated remains an unresolved issue in the growth literature. Studies on remittance and financial development provide mixed results in literature. The findings are inconclusive due to the econometric methods researchers have used, data and period of study. For instance, a study conducted by Akcay (2020) suggests that there is a non-linear U-shaped relationship between financial development and remittances. In addition, a recent study further suggests that remittances promote financial development only if received in large quantities (Brown and Carmignani, 2015). Some studies observed that there may exist a bidirectional causality between remittances and financial development. These studies further explain that volume of remittances increases through lowering transactional cost with the help of a well-functioning banking system with low transaction costs (Aggarwal, Demirgüç-Kunt and Pería, 2011; Giuliano and Ruiz-Arranz, 2009). On the other hand, few studies e.g., Kumar (2013) and Brown, et al. (2013) report that the remittances show negative and insignificant association with financial developments.

As the results from above studies are inconclusive, this study aims to fill this gap by investigating further whether there is a relationship between the remittance and financial development in selected South Asian countries. Moreover, it also tries to identify causality between remittance and financial

development and between economic growth and financial development. Section II of the study reports the empirical model and data used in the paper while section III presents the empirical results and section IV concludes the paper.

## II. Data and Empirical Model

The study includes five Asian countries namely India, Nepal, Sri Lanka, Pakistan and Bangladesh for the period of 1995-2020. To check the relationship between financial development, remittance and economic growth, this study used panel data with  $N \times T$  ( $5 \times 26 = 130$ ) observations for model specification. Panel estimation techniques were used as the panel data conserve more information for better understanding than pure time series and cross sectional data. The data used for this study are collected from World Development Indicator (WDI). The model used in this study is developed by Bhattacharya *et al.* (2018). In this model, financial development is the dependent variable while remittance and economic growth are independent variables. Following Bhattacharya *et al.* (2018), they study employed broad money ( $M_2$ ) as the proxy of financial development while remittance is personal remittance received by a country and per capita GDP as the proxy for economic growth. Our model of financial development is expressed in Equation (1):

$$\ln(FINDEV)_{it} = \beta_0 + \beta_1 \ln(REMIT)_{it} + \beta_2 \ln(GDP)_{it} + \eta_{it} \quad (1)$$

Here,

$FINDEV$  = Financial development

$REMIT$  = Personal remittances received

$GDP$  = Gross domestic product (GDP) per capita

$\beta_0$  = Intercept term

$\beta_1, \beta_2$  = Slope coefficients of the independent variables

$\eta$  = Error term

Panel estimation techniques such as pooled regression method (POLS), fixed effect (FE), random effect (RE), feasible generalized least squares (FGLS) and panel causality test were used due to nature of the data and to obtain the objectives of the study. Normally, the pooled regression model estimates the slope of the model and constant value of the intercept of time and cross sectional unit. Although, Greene (2003) argues that the estimates from the common constant method are unbiased, consistent and efficient; a major shortcoming is that there is no distinction among the various countries being investigated and

the method does not give an indication of whether the response of the dependent variable Y, to the explanatory variables is the same for all the countries. Hence, the common constant method is restrictive because it conceals the country-specific characteristics and heterogeneity or differences that may exist among the countries being investigated. Therefore, the study followed the fixed effect method.

An advantage of the fixed effects method is that observable country-specific effects can be controlled. However, the fixed effects method has some crucial limitations. Bender and Theodossiou (2015) argue that fixed effects models assume that country specific effects remain the same over time but realistically, the effects vary over time due to policy variations. Secondly, Baltagi (2005) argues that any time-invariant effect be incorporated into the single fixed effects, thus, making it problematic to interpret the results in a way that would make economic sense as it is just the sum of all the country-specific fixed effects whereas the random effects modelling assumes that the country's error term is uncorrelated with the explanatory variables, which allows time-invariant variables to feature as explanatory variables.

### **III. Diagnostic Tests and Empirical Results**

The empirical results are composed of three parts, the first part provides diagnostic results whereas the pooled regression results are presented in the second part. In third part, results from panel causality are presented.

#### ***Diagnostic Test Results***

In this study, different diagnostic tests were performed to obtain unbiased estimated results from the data used. Variance inflation factor (VIF) was found to be lower than the threshold level which indicates that the absence of multicollinearity among the variables (see Appendix). The Breusch-Pagan test was performed to see the presence of heteroskedasticity. Additionally, White test for heteroskedasticity presence was also checked. These two diagnostic tests found the presence of heteroskedasticity. In choosing the right model, Hausman test (HT) was used to check the fittest and right model for this study analysis between random effect (RE) and fixed effect (FE). When HT gives zero correlation results between error and the regressors the RE and FE are becoming similar in result consistency. But if there is correlation between error component and any regressors then random effect shows inconsistent results. That is why it is rationable for using the fixed effect model. Hence, computational

convenience prefers FE model. Moreover, null hypothesis of Hausman test is that Random effect is appropriate however the alternate hypothesis of fixed effect is appropriate. The output of Hausman test shows that the test fails to accept the null, as the p-value (Prob>chi2) is less than 5% which allows us to choose Fixed-Effects model. Moreover, unit root test was done to see the time series properties of the variables. This was done in order to correctly apply the panel estimation techniques. In this study, panel unit root tests such as Levin, Lin and Chu (2002) (LLC), Im, Pesaran and Shin (2003) (IPS), Augmented Dickey Fuller (ADF) Dickey and Fuller (1979) and Phillip-Perron (PP) Phillips and Perron (1988) tests were performed which accounts for both heterogeneity and cross-sectional dependence across panels (Appendix).

### **Empirical Results**

The regression results of remittances and economic growth on financial development are presented in Tables 1. In explaining the remittance impact on financial development, the coefficients of remittances of 0.0201 and 0.0132 are positive and statistically significant at 5% and 10% level of significance for the POLS and FE estimates respectively. These suggest that in 1% increase in remittance inflows to the selected South Asian countries would lead to 0.0201% or 0.0132% increase in financial development. In other words, the impact of remittances on financial development is positive and statistically significant, indicating that remittances contribute positively to financial development in the South Asian countries. This finding is compatible with the study of Donou-Adonsou *et al.* (2020) and Giuliano and Ruiz-Arranz (2009). These studies confirmed that remittances appear to be one of the most significant sources of capital for economic development. In the same manner, GDP was found to be positively related with financial development across the models. These results show that 1% increase in the GDP per capita would increase financial development by 0.389% for the POLS, 0.435% for FE and 0.155% for FGLS. These results support the earlier works of Brown *et al.* (2013) that assumed increasing per capita GDP induced the financial development in developing countries.

This study also aimed to see the causal relationship between financial development and remittances and financial development and economic growth. Following Dumitrescu and Hurlin (2012), this study test the direction of causality between financial development and remittances using a pairwise panel causality test. The direction of causality between financial development and economic

**Table 1: Regression Results (after correcting unit root problem)**

<i>Financial Development</i>	(1) <i>Pols</i>	(2) <i>Random- effects</i>	(3) <i>Fixed- effects</i>	(4) <i>FGLS</i>
REMITTANCE	0.0201** (0.0255)	0.0201* (0.0255)	0.0132* (0.0262)	0.0244 (0.0255)
GDP	0.389** (0.185)	0.389** (0.185)	0.435** (0.203)	0.151** (0.153)
CONSTANT	0.132*** (0.00864)	0.132*** (0.00864)	0.131*** (0.00912)	0.136*** (0.00822)
Observations	130	130	130	130
R-squared	0.38		0.38	
Number of Country	5	5	5	5

Standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Source: Authors' own calculation

growth was also test in the same manner.

**Table 2: Granger Causality Test: Full Sample**

FINDEV → REMIT			
Wald Statistics	2.1540		
Zbar ( $Z_{NT}$ )	1.8246		$P$ -value = 0.0681, Lags (1)
Zbar tilde ( $\tilde{Z}_N$ )	1.4026		$P$ -value = 0.0716, Lags (1)
REMIT → FINDEV			
Wald Statistics	3.3328		
Zbar ( $Z_{NT}$ )	3.3328		$P$ -value = 0.0002, Lags (1)
Zbar tilde ( $\tilde{Z}_N$ )	2.9713		$P$ -value = 0.0030, Lags (1)
FINDEV → GDP			
Wald Statistics	4.4042		
Zbar ( $Z_{NT}$ )	5.3826		$P$ -value = 0.0000, Lags (1)
Zbar tilde ( $\tilde{Z}_N$ )	4.3972		$P$ -value = 0.0000, Lags (1)
GDP → FINDEV			
Wald Statistics	1.3782		
Zbar ( $Z_{NT}$ )	0.5979		$P$ -value = 0.5499, Lags (1)
Zbar tilde ( $\tilde{Z}_N$ )	0.3702		$P$ -value = 0.7113, Lags (1)

Source: Authors' own calculation

### ***Panel Causality or Feedback Test***

The inflows of remittance can be affected by the GDP of host country Donou-Adonsou *et al.* (2020). The identification of the direction of causality is essential for policy making and recommendations regarding the financial development and remittances. The panel causality test results show evidence of a feedback relationship between financial development and remittances while financial development and economic growth do not show the feedback effect. The causality test results imply that remittances drive financial development and the financial development is sensitive to this causal effect.

### **IV. Conclusion**

In the developing country perspective, academics and policymakers nowadays more concern about the details of the role of international remittance on financial integration and consequent effect on economic development. The question of how remittance impacts on the development of financial sector across country. Why some countries underperform in developing well-functioning financial sector despite receiving considerable foreign remittance? If the relation exists between remittance and financial development, if so, is it stable over time? Answering to such questions, this study shed some lights on these questions by investigating the relationship between workers' remittances, economic growth, and financial development in selected South Asian countries. Regression estimates and panel causality test affirm that there is strong and significant relationship exists between remittances and financial development in a cross-country context over a period of two decades.

As remittance and financial development show bidirectional causality, policy should be made to send more skilled migrant and expand migrant markets in the one hand and to ensure well-functioning financial sectors which effectively reduce the transactional cost of remittances on the other hand. Policies should also be made to create proper channels to remit and to ensure migrants welfare for the future. Since, remittance income is the major source of external funding for many developing countries, South Asian countries must focus in developing skilled and trained migrants so as to keep receiving higher level of remittance. Future research should focus to identify the factors that impede legal remit process and to create more formal and informal channels within the legal framework to encourage remittance income.



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**Appendix**

**Table 3: Multicollinearity Test**

<i>Variable</i>	<i>VIF</i>	<i>1/VIF</i>
REMIT	1.21	0.828593
GDP	1.21	0.828593
Mean VIF	1.21	

*Source:* Authors' own calculation

**Table 4: Breusch-Pagan Test**

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance; Variables: fitted values of FINDEV
chi2(1) = 49.67
Prob > chi2 = 0.0000

*Source:* Authors own calculation

**Table 5: White Test for Heteroscedasticity Check**

White's test for			
Null hypothesis Ho: homoskedasticity			
Alternative hypothesis Ha: unrestricted heteroskedasticity			
chi2(5) = 98.59			
Prob > chi2 = 0.0000			
Source	chi2	df	p-value
Heteroskedasticity	98.59	5	0.0000
Skewness	30.49	2	0.0000
Kurtosis	0.20	1	0.6570
Total	129.28	8	0.0000

*Source:* Authors' own calculation

**Table 6: Hausman Test**

	<i>Coefficients</i>			
	<i>(b)</i> <i>Random-Effects</i>	<i>(B)</i> <i>Fixed-Effects</i>	<i>(b-B)</i> <i>Difference</i>	<i>sqr(diag(V_b-V_B))</i> <i>S.E.</i>
REMIT	0.536127	0.4193085	0.116819	0.020710
GDP	1.863641	2.370478	-0.506836	0.075359
Chi2(2)	46.71			
Prob>chi2	0.0000			

*Source:* Authors' own calculation

**Table 7: Panel Unit Root Test Results**

<i>Variable</i>	<i>Status</i>	<i>LLC</i>	<i>IPS</i>	<i>ADF</i>	<i>PP</i>
FINDEV	At Level	-1.5126**	1.6948	1.3102	1.0972
	First Difference	-2.3313***	-4.0289***	-5.4590***	-6.6900***
REMIT	At Level	-2.0768*	0.6333	0.7850	0.8112
	First Difference	-2.0511***	-4.0289***	-7.8951***	-6.1342***
GDP	At Level	-0.5741	4.7927	2.5894	2.5369
	First Difference	0.5776	-1.8716**	-2.3242**	-2.1672**

*Source:* Authors' own calculation