

IMPACT OF WORKERS' REMITTANCES ON ECONOMIC GROWTH IN SOUTH ASIA: A MEDIATED MODERATION APPROACH

¹**Rashid Hussain**

Phd Scholar, Department of Management sciences, Institute of Business Management and Administrative Sciences, The Islamia University of Bahawalpur, Pakistan,

Email: rashidhosain@yahoo.com

²**Prof. Dr. Abou Bakar**

Professor, Department of Management Sciences, Institute of Business Management and Administrative Sciences, The Islamia University of Bahawalpur, Pakistan,

Email: aboubakar02@hotmail.com

³**Dr. Kalsoom Akhtar**

Lecturer, Department of Management sciences, Institute of Business Management and Administrative Sciences, The Islamia University of Bahawalpur, Pakistan,

Email: kalsoom.akhtar@iub.edu.pk

ABSTRACT

Workers' remittances constitute a vital source of external finance for South Asian economies, yet the mechanisms through which they influence economic growth remain insufficiently understood. This study investigates the impact of workers' remittances on economic growth in seven South Asian countries through a mediated moderation framework. Specifically, it examines the direct effect of remittances on economic growth, the mediating role of financial development in transmitting this effect, and the moderating role of human capital in strengthening the remittance-growth nexus. The empirical analysis employs annual panel data covering the period 2000–2025, comprising 182 country-year observations. Economic growth was measured by GDP growth, workers' remittances by personal remittances received, financial development by domestic credit to the private sector, and human capital by literacy rate. The study also controlled for gross fixed capital formation, inflation, foreign direct investment, trade openness, and exchange rate. The empirical analysis included descriptive statistics, panel unit root testing, multicollinearity diagnostics, fixed effects and random effects estimation, and the Hausman specification test. The main growth model was estimated using the random effects model, while the mediation equation was estimated using the fixed effects model. The findings show that workers' remittances have a positive but statistically insignificant direct effect on economic growth. Financial development also shows an insignificant direct effect in the main growth model. However, the interaction between remittances and human capital is positive and statistically significant, indicating that literacy strengthens the growth effect of remittances. Gross fixed capital formation and foreign direct investment have positive and significant effects on economic growth, while trade openness has a negative and significant effect. The mediation results further show that remittances and literacy positively and significantly affect financial development. Overall, the study concludes that remittances alone may not be sufficient to generate strong growth effects in South Asia; their contribution depends on complementary conditions such as human capital, financial-sector depth, productive investment, and macroeconomic stability. The study recommends policies that promote formal remittance channels, financial inclusion, literacy, productive investment, and export competitiveness.

Keywords: Workers' remittances; economic growth; financial development; human capital; South Asia; mediated moderation; panel data.

1. Introduction

The expansion of productive capacity, the increase of income levels and the capacity of the nation to offer improved employment, infrastructure, health, education and social services constitute among the most crucial objectives of every economy, of which is economic growth. Growth in development

economics is not limited to just a growth in national income, but rather a process by which the economy becomes more productive, stable and capable of raising the standard of living of its people. The word growth indicates an increase; in an economy in a macroeconomic context, growth typically represents an increase in real output over time. It is therefore considered a central goal of economic policy, particularly for developing and emerging countries where poverty, unemployment, weak productive capacity, and external financial constraints remain major challenges (Barro, 1991; Solow, 1956).

South Asian economies have passed through different phases of growth, structural transformation, and external-sector pressures. Countries such as India, Pakistan, Bangladesh, Sri Lanka, and Nepal have large labor forces, strong migration networks, and a long history of outward migration to the Middle East, Europe, North America, and other developed regions. The macroeconomic issues that these economies are experiencing are similar: exchange-rate pressure, inflation, fiscal constraints, unemployment, poverty, and reliance on external inflows. In this context, remittances become a key macro-economic flow that can help improve the foreign exchange reserves, balance of payments stability and provide extra purchasing power to the recipient economies.

As concerned the inflow of capital that migrants workers send home from overseas is referred to as remittances. A key process in the flow of resources from industrialized countries to the poor countries is worker remittances or transfers (Russell, 1992). It is generally accepted that remittances are a share of foreign and/or other region-based wages received by migrants. Meeting the needs of the families that the immigrants leave behind is the main purpose of remittances. It's the key indicator of the country's economy. Remittances are considered to be the primary foreign exchange earner in underdeveloped countries.

Remittances take a unique place in the development process since they are distinct from foreign aid, foreign direct investment and portfolio investment flows. The amount of FDI is typically based on investor confidence; market size, political stability, and investor expectations of returns on investment, whereas the amount of official development assistance is typically based on donor priorities and international policy conditions. Remittances, in contrast, are usually motivated by family obligations, altruism, inheritance motives, repayment of migration costs, and household risk-sharing arrangements (Lucas & Stark, 1985). This household-based character makes remittances relatively stable and sometimes counter-cyclical, particularly when migrants send additional support during economic downturns, natural disasters, health crises, or household emergencies.

While FDI (Foreign Direct Investment) is the first effective source of foreign capital in emerging nations, as remittances believe rank second. Remittances play multiple roles for developing economies as a source of development funding and act as insurance in developing nations, therefore the majority of them rely on them. An estimated \$685 billion would be sent to underdeveloped countries that also consider LMICs in 2024, surpassing the sum FDI and also exceeding official development assistance (ODA). Although this increase varies by region, it is anticipated to occur at a rate of 2.3%. The forecasting of World Bank is that there is vigorous increase in remittances inflow to developing countries by US\$ 685 billion in 2024. The primary purpose of remittances in developing nations is to support family needs, but they can also be used for savings, credit mobilization, and various forms of investment. Food, clothes, housing, healthcare, and education account for 90% of global remittances in underdeveloped nations (IFAD, 2009). The beneficial effects of remittances are primarily observed at the micro level since they involve resource transfers within families or communities. The household budget of the receiving households is directly impacted by these remittances, which they can either save or consume for necessities such as durable and non-durable products (Munir, 2010).

This study is motivated by mixed findings in the literature on remittance-growth. Some research indicates that remittances act as a policy to stimulate growth by easing credit constraints on households, increasing consumption, education and investment. Findings from other studies, however, are weak or insignificant, suggesting that remittances could be saved for consumption or that they might lead to macroeconomic vulnerabilities or dependency (Barajas et al., 2009). The results of these mixed effects indicate that the remittances-growth relationship is conditional and potentially influenced by financial development, human capital and overall macroeconomic conditions at home.

Table 1. Remittances Share in GDP of Selected South Asian Economies

Country	Remittances share in GDP
Nepal	26.3
Pakistan	7.9
Sri Lanka	7.1
Bangladesh	5.21
India	3.4
South Asia	4.1

Source: World Bank Indicator (2024)

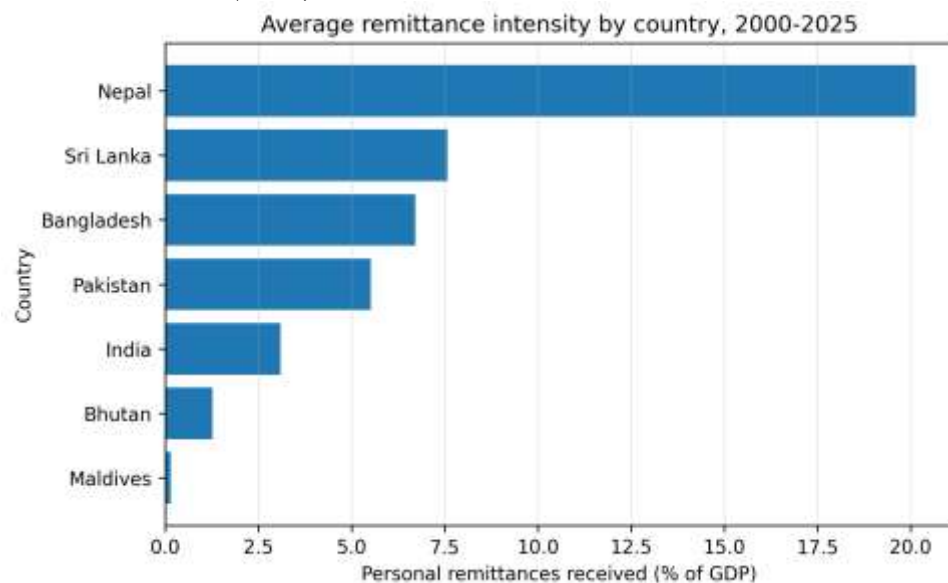


Figure 1. Average Remittance Intensity by Country, 2000-2025

Note. Country averages are calculated over the full sample period. Source: Author's calculation based on the study data set.

Table 2 Average Remittance and Growth Indicators by Country

Country	Remittances (% of GDP)	GDP growth (%)	Financial development	Trade (% of GDP)
Nepal	20.14	4.19	58.16	45.04
Sri Lanka	7.57	3.99	37.67	53.95
Bangladesh	6.70	5.87	35.68	34.82
Pakistan	5.52	3.96	16.76	28.40
India	3.09	6.25	41.94	43.29

Bhutan	1.27	5.93	40.15	86.51
Maldives	0.15	5.61	34.57	182.24

Note. Values are country averages for 2000-2025.

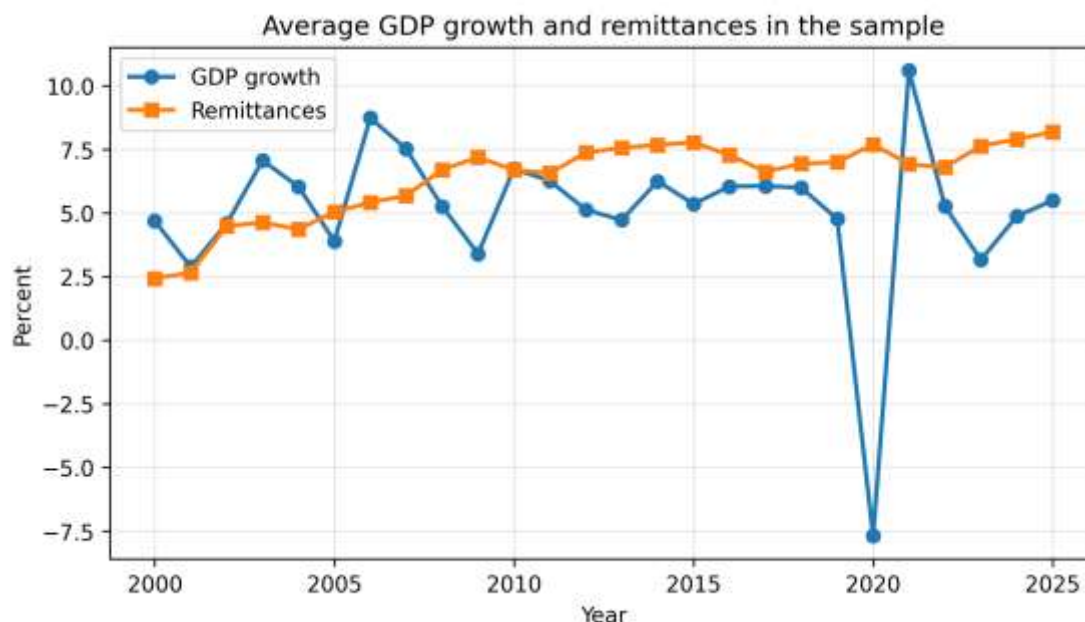


Figure 2 Average GDP Growth and Remittance Inflows in the Sample

Note. GDP growth and remittances are measured in percent. Source: Author's calculation based on the study data set.

Figure 2 presents the average pattern of GDP growth and remittance inflows. The figure is not intended to establish causality; rather, it provides a descriptive background for the empirical model. The econometric analysis later controls for financial development, human capital, investment, inflation, FDI, trade openness, and exchange rate to estimate the conditional relationship more rigorously.

1.5 Objective of the Study

The study aims to examine the impact of remittances on economic growth and to provide relevant guidance for improving allocation and productive use of remittance inflows. The major goal is to investigate how worker remittances and economic growth are related, with an emphasis on figuring out how much remittance inflows support the growth and progress of South Asian economies.

1.6 Research Questions

The main sorted questions which need to be answered by this study are as under:

1. Do the workers' remittances significantly impact the economic growth in the selected south Asian economies?
2. How might government policies strengthen the beneficial effects of remittances on economic expansion in selected South Asian economies?

2. Literature Review

The current study investigates the impact of workers' remittances on economic growth in selected South Asian economies using a mediated moderation approach. Financial development is treated as the mediating channel, while human capital, measured by literacy rate, is treated as the moderator. Workers' remittances have become an increasingly important source of external finance for developing economies, particularly in South Asia, where international labour migration contributes

substantially to household income and foreign-exchange earnings. Although remittances are private financial transfers, their economic consequences extend beyond household welfare and consumption. They can relax liquidity constraints, increase savings and investment, support entrepreneurship, finance education and health expenditures, and stimulate aggregate demand. Through these channels, remittance inflows may contribute positively to economic growth. However, the growth effects of remittances are not necessarily automatic because their economic contribution depends on how recipient households use these resources and how effectively domestic economic and financial institutions convert them into productive activities. Consequently, empirical evidence on the relationship between workers' remittances and economic growth remains mixed.

Recent empirical evidence from South Asia generally supports a positive relationship between remittance inflows and economic performance. Mostafa and Wadud (2024), using panel data for Bangladesh, India, Pakistan, and Sri Lanka, reported a significant long-run relationship between remittances and economic growth and found that remittance inflows contribute positively to GDP in both the short and long run. Their findings indicate that the growth-enhancing potential of remittances becomes particularly important when these inflows are directed toward productive economic activities. Similarly, Mostafiz and Kang (2025), examining Bangladesh, India, Pakistan, and Nepal over the period 1996–2023, found a positive and statistically significant relationship between remittances and GDP per capita. Their results further indicated feedback between remittance inflows and economic activity, suggesting that remittances and economic development may reinforce each other over time. Recent regional evidence also confirms the growth-enhancing potential of remittances. Hamal et al. (2025), examining SAARC economies over the period 2000–2024 through panel cointegration and Fully Modified Ordinary Least Squares, found evidence of a stable long-run relationship and concluded that remittance inflows exert a positive and statistically significant effect on real GDP per capita. Abbas et al. (2025) similarly documented a positive contribution of remittance inflows to economic growth in South Asia after addressing potential endogeneity concerns. Their comparative analysis further suggested that the growth effect of remittances is relatively stronger in South Asian economies than in a broader sample of developing countries. Recent country-specific evidence also supports this argument. Rahman et al. (2026), using evidence from Pakistan, reported that remittances positively affect economic growth in the long run. The empirical literature does not provide an entirely uniform conclusion. Akter et al. (2024), analysing Bangladesh, India, and Pakistan, found that an increase in migrant remittance inflows did not necessarily promote economic growth under their preferred fixed-effects specification. Their findings indicated that an expansion in remittance inflows can fail to generate productive economic outcomes when these resources are concentrated primarily in consumption rather than savings and investment. Shah (2024) further demonstrated that remittance shocks may have asymmetric effects on economic activity in India, suggesting that increases and decreases in remittance inflows do not necessarily produce identical macroeconomic responses. Zaarour et al. (2025), applying a Panel VAR framework, found that remittance inflows generally support economic growth and investment, although the strength and nature of the transmission mechanisms remain dependent on broader economic conditions. These mixed findings indicate that examining only the direct effect of remittances on economic growth may provide an incomplete understanding of the remittance–growth relationship.

One important factor that may explain these heterogeneous findings is the development of the domestic financial system. Financial development provides the institutional mechanism through which remittance inflows can be transformed from household transfers into savings, credit, investment, and productive economic activity. When remittances are transferred through formal financial institutions, they can increase bank deposits, promote financial inclusion, strengthen relationships between

households and financial intermediaries, and expand the pool of funds available for private-sector lending. In this way, remittances may contribute to financial deepening while simultaneously improving the capacity of financial institutions to allocate resources toward productive sectors. In contrast, where financial systems are underdeveloped or remittance flows are predominantly transmitted through informal channels, the ability of remittances to stimulate wider economic activity may remain restricted. Recent evidence supports an important relationship between remittance inflows and financial development. Pal and Mahalik (2024) found that remittances significantly influence financial development in developing regions, although the magnitude and direction of this relationship vary according to institutional and economic conditions. Their findings demonstrate that institutional quality strengthens the contribution of remittances to financial development, indicating that remittance inflows alone are insufficient to guarantee improvements in financial intermediation. Rather, their developmental contribution depends on the ability of domestic institutions to mobilize and allocate these resources efficiently. This argument is particularly relevant to South Asian economies because improvements in formal financial inclusion can transform remittances from short-term household transfers into resources that support savings, credit formation, business investment, and long-term economic development. The relationship between remittances, financial development, and economic growth further suggests that financial development may constitute an important transmission channel. A well-functioning financial system improves the mobilization of savings, reduces transaction costs, facilitates credit allocation, and directs financial resources toward more productive investment opportunities. Remittances may therefore influence economic growth not only directly through household consumption and investment but also indirectly by contributing to financial development, which subsequently facilitates productive capital formation. This argument implies that financial development should not merely be treated as an independent control variable but may represent an intermediate mechanism through which remittance inflows affect economic growth.

Although previous studies have increasingly recognized the importance of financial development, much of the existing literature treats it as an independent explanatory variable or as a moderator of the remittance–growth relationship. Comparatively limited attention has been paid to its potential role as a mediating mechanism. The evidence of Pal and Mahalik (2024) demonstrates that remittances can influence financial development, while Afridi et al. (2024) and Li et al. (2026) establish that financial development significantly shapes economic outcomes associated with remittance inflows. These findings collectively provide a strong theoretical basis for examining whether remittance inflows first contribute to financial development and whether improvements in financial development subsequently promote economic growth. Accordingly, the present study proposes that financial development constitutes an important mediating channel through which workers' remittances influence economic growth in South Asian economies. The extent to which remittance inflows are converted into productive economic activities may also depend on the level of human capital available within recipient economies. Human capital, reflected in education, knowledge, skills, and health, improves individuals' capacity to identify investment opportunities, undertake entrepreneurial activities, adopt new technologies, and use financial resources more efficiently. Therefore, the same amount of remittance inflow may generate different economic outcomes across countries depending on their levels of human capital. Economies with stronger human-capital foundations are likely to utilize remittance resources more productively, whereas economies with weaker educational and skill capacities may experience a greater concentration of remittance income in immediate consumption. Recent empirical evidence provides strong support for this conditional relationship. Azizi et al. (2024), using data from 113 developing economies, found that remittances contribute positively to economic growth in countries characterized by relatively high levels of human capital but fail to generate

comparable growth effects in countries with low levels of human capital. Their findings further indicated that remittance inflows promote physical-capital investment primarily in countries possessing stronger human-capital capacity. This evidence suggests that human capital functions as an absorptive capacity that enables recipient economies to translate remittance inflows into productive investment and long-term growth.

The relevance of human capital is particularly evident in South Asia. Abbas et al. (2025) reported a positive and statistically significant interaction between remittance inflows and human capital in South Asian economies. Their findings indicate that improvements in education, health, skills, and training can enhance the productive utilization of remittance income and strengthen its contribution to economic growth. Dash and Gupta (2024) also found important short- and long-run relationships between remittance inflows and human development in South Asian economies, while Nasrin et al. (2024), analysing seven South Asian countries, reported that personal remittances exert a positive and significant effect on human development. Khan (2025) similarly found that migrant remittances promote economic growth while also contributing to improvements in education and health outcomes across developing economies. These findings suggest a mutually reinforcing relationship in which remittances can support the accumulation of human capital, while a stronger human-capital base improves the ability of recipient economies to transform remittance income into productive investment and sustainable economic expansion.

The existing literature therefore indicates that the growth effects of remittances cannot be fully explained through a simple direct relationship. Three important gaps remain. First, despite extensive research, findings concerning the direct effect of remittances on economic growth continue to vary across countries, periods, and estimation approaches. Second, although financial development has increasingly been identified as an important factor in the remittance–growth relationship, relatively limited attention has been devoted to testing whether it acts specifically as a mediating channel through which remittance inflows are transmitted into economic growth. Third, while recent evidence demonstrates that human capital can strengthen the economic contribution of remittances, relatively few studies integrate this moderating role with the financial-development transmission mechanism within a single empirical framework. The present study addresses these limitations by developing an integrated mediated moderation framework for seven South Asian economies over the period 2000–2025. Rather than examining only whether workers' remittances influence economic growth, the study investigates how this relationship operates through financial development and whether its strength varies according to the level of human capital. By jointly examining the direct effect of remittances, the mediating role of financial development, and the moderating role of human capital, the study provides a more comprehensive explanation of the remittance–growth nexus. This approach is particularly relevant for South Asian economies, where the developmental consequences of substantial remittance inflows may depend not only on their magnitude but also on the ability of domestic financial institutions to mobilize these resources and the capacity of human capital to transform them into productive and sustainable economic outcomes.

3. Data and Methodology

The Data

The data set consists of selected South Asian economies and is annual-panel data from 2000 to 2025. The sample size is comprised of 7 countries and the data is presented in country-year format for studying the effect of workers' remittances on economic growth. The panel data are helpful in this context since they enable the analysis to account for differences between countries as well as differences in time (Baltagi, 2005; Hsiao, 2003).

Table .3 Description and Definition of variables

Variable	Full name	Unit of measurement	Source of Data
GDP	GDP GROWTH	GDP growth (annual %)	WDI
RIM	REMITTANCES	Personal remittances, received (% of GDP)	WDI
FD	DOMESTIC CREDIT TO PRIVATE SECTOR	Domestic credit to private sector (% of GDP)	WDI
HCAP	Human Capital	Literacy rate, adult total (% of people ages 15 and above)	WDI
(RIM×LIT)	INTERACTION TERM	Centered RIM × centered literacy	
GFCF	GROSS FIXED CAPITAL FORMATION	Gross fixed capital formation (annual % growth)	WDI
INF	INFLATION	Inflation, GDP deflator (annual %)	WDI
FDI	FOREIGN DIRECT INVESTMENT	Foreign direct investment, net inflows (% of GDP)	WDI
TRADE	TRADE	Trade (% of GDP)	WDI
ER	EXCHANGE RATE	Official exchange rate (LCU per US\$, period average)	WDI

World Bank. (2026). World Development Indicators. <https://databank.worldbank.org/source/world-development-indicators> (Accessed May 10, 2026).

Estimation Techniques

This section explains the estimation techniques used to examine the impact of workers' remittances on economic growth in selected South Asian economies. Since the study uses country-wise annual panel data, panel data techniques are applied. Panel data analysis is appropriate because it combines both cross-sectional and time-series dimensions and can control for unobserved country-specific heterogeneity (Baltagi, 2005; Hsiao, 2003; Wooldridge, 2010).

The study first applies preliminary diagnostic tests, including descriptive statistics, correlation analysis, panel unit root testing, and multicollinearity testing. After that, fixed effects and random effects models are estimated. The Hausman specification test is then used to select the more appropriate model between fixed effects and random effects (Hausman, 1978; Wooldridge, 2010).

Model Specification

The main objective of this study is to investigate the impact of workers' remittances on economic growth through a mediated moderation framework. The model includes financial development as a mediating variable because financial systems may channel remittances into deposits, credit, and investment (Giuliano & Ruiz-Arranz, 2009; Levine, 1997). Human capital is included as a moderating variable because the productive use of remittances may depend on the knowledge, skills, and education of households and workers (Becker, 1964; Lucas, 1988).

The empirical model of the study is specified as follows:

$$GDP_{it} = \beta_0 + \beta_1 cRIM_{it} + \beta_2 FD_{it} + \beta_3 cLIT_{it} + \beta_4 (cRIM \times cLIT)_{it} + \beta_5 GFCF_{it} + \beta_6 INF_{it} + \beta_7 FDI_{it} + \beta_8 TRADE_{it} + \beta_9 ER_{it} + \mu_i + \varepsilon_{it}$$

Where GDP represents economic growth, cRIM represents centered workers' remittances, FD represents financial development, cLIT represents centered human capital, cRIM x cLIT represents the interaction between workers' remittances and human capital, GFCF represents gross fixed capital formation, INF represents inflation, FDI represents foreign direct investment, TRADE represents trade openness, ER represents exchange rate, μ_i represents country-specific effects and ε_{it} represents the error term. The use of centered variables in interaction models is recommended to reduce non-essential multicollinearity and improve interpretability (Aiken & West, 1991; Cohen et al., 2003).

Random Effects Model

The random effects model is used when individual country-specific effects are assumed to be randomly distributed and uncorrelated with the explanatory variables. The model is suitable for panel data when unobserved country effects are not systematically correlated with the independent variables (Baltagi, 2005; Wooldridge, 2010). Unlike the fixed effects model, the random effects model uses both within-country and between-country variation and can provide efficient estimates when its assumptions are satisfied (Gujarati & Porter, 2009; Hsiao, 2003).

In this study, the random effects model is applied after comparing fixed effects and random effects through the Hausman specification test.

Variance Inflation Factor

The variance inflation factor test is used to detect multicollinearity among explanatory variables. Multicollinearity occurs when independent variables are highly correlated with each other, which can inflate standard errors and make coefficient estimates less reliable (Gujarati & Porter, 2009; O'Brien, 2007). VIF values below 5 are often considered acceptable in applied research, whereas very high values may indicate serious multicollinearity (Hair et al., 2019; O'Brien, 2007).

Because the study includes an interaction term between workers' remittances and human capital, workers' remittances and human capital are mean-centered before constructing the interaction term. Mean-centering is a standard approach in moderation models because it reduces non-essential multicollinearity between the original variables and the interaction term (Aiken & West, 1991; Cohen et al., 2003).

The centered variables are generated as follows:

$$\text{cRIM} = \text{RIM} - \text{mean}(\text{RIM})$$

$$\text{cLIT} = \text{LIT} - \text{mean}(\text{LIT})$$

$$\text{cRIM_LIT} = \text{cRIM} \times \text{cLIT}$$

After generating the centered interaction term, the VIF test is applied again. If VIF values are within the acceptable range, the final model can be interpreted without serious multicollinearity concerns (Gujarati & Porter, 2009; O'Brien, 2007).

Panel Unit Root Test

Panel unit root testing is conducted to examine the stationarity properties of the variables. Stationarity testing is important because non-stationary variables may produce misleading regression results. The study uses Fisher-type panel unit root tests based on augmented Dickey-Fuller procedures. Fisher-type tests combine individual unit root tests across panels and are suitable for panel data applications (Choi, 2001; Maddala & Wu, 1999).

The null hypothesis of the Fisher-type unit root test states that all panels contain unit roots, while the alternative hypothesis suggests that at least one panel is stationary. If the probability value is less than the selected significance level, the null hypothesis is rejected, indicating evidence of stationarity (Choi, 2001; Maddala & Wu, 1999).

Hausman Specification Test

The Hausman specification test is applied to choose between fixed effects and random effects models. The fixed effects model allows country-specific effects to be correlated with explanatory variables, while the random effects model assumes that such country-specific effects are not correlated with the explanatory variables (Baltagi, 2005; Hausman, 1978; Wooldridge, 2010).

The null hypothesis of the Hausman test states that the random effects model is appropriate, while the alternative hypothesis supports the fixed effects model. If the p-value is greater than 0.05, the null hypothesis is not rejected and random effects is preferred. If the p-value is less than 0.05, the null hypothesis is rejected and fixed effects is preferred (Hausman, 1978; Wooldridge, 2010).

In this study, the Hausman test supports the use of the random effects model. Therefore, the random effects estimator is selected as the final estimation technique for analyzing the relationship between workers' remittances and economic growth.

Mediation Equation

Since financial development is used as the mediating variable, a separate mediation equation is estimated to examine whether workers' remittances influence financial development. Mediation analysis examines whether the effect of an independent variable on a dependent variable operates through a third variable or channel (Baron & Kenny, 1986; Preacher & Hayes, 2008). In this study, the theoretical channel is that remittances may enter the formal financial system, increase deposits, improve credit availability, and then support growth-enhancing investment (Giuliano & Ruiz-Arranz, 2009; Levine, 1997).

The mediation equation is specified as follows:

$$FDit = \alpha_0 + \alpha_1 RIMit + \alpha_2 GFCFit + \alpha_3 INFit + \alpha_4 FDIit + \alpha_5 TRADEit + \alpha_6 ERit + \alpha_7 HCApit + \mu_i + \varepsilon_{it}$$

In this study, financial development is measured by domestic credit to the private sector as a percentage of GDP. A positive relationship between remittances and financial development would support the argument that remittance inflows contribute to the development of financial institutions and credit markets (Giuliano & Ruiz-Arranz, 2009; King & Levine, 1993).

Final Estimation Procedure

The estimation procedure follows a systematic approach. First, the data are checked for missing values, panel balance, and variable structure. Second, descriptive statistics and correlation analysis are applied. Third, panel unit root tests are conducted to examine stationarity. Fourth, the variance inflation factor test is used to check multicollinearity. Fifth, fixed effects and random effects models are estimated. Sixth, the Hausman test is applied to select the appropriate model. Finally, the random effects model is used to interpret the main empirical results. This sequence is consistent with standard panel-data econometric practice (Baltagi, 2005; Gujarati & Porter, 2009; Wooldridge, 2010).

4 Results and Discussion

Descriptive Statistics

Table 3 Descriptive Statistics of the Study Variables

Variable	Obs.	Mean	Std. dev.	Minimum	Maximum
GDP growth (gdp)	182	5.115	5.350	-32.909	37.508
Inflation (inf)	182	7.538	7.874	-3.365	68.010
Foreign direct investment (fdi)	182	2.003	3.145	-0.639	16.783
Gross fixed capital formation (gfcf)	182	8.808	18.780	-55.414	91.815
Exchange rate (er)	182	83.879	65.991	11.770	476.081
Workers' remittances (rim)	182	6.350	6.892	0.077	28.162
Human capital/literacy (lit)	182	70.600	16.904	45.408	99.287

Trade openness (trade)	182	67.751	53.104	21.460	259.888
Financial development (fd)	182	37.846	18.036	3.858	103.651

Note. The table reports descriptive statistics for the final variables used in the empirical model. Values are based on 182 country-year observations.

Descriptive statistics give an overview of variables used in analysis as regards distribution and variation. The number of observations, mean, standard deviation, minimum and maximum values are reported in Table. The results indicate that there are 182 country-year data observations in the data set. The mean is 5.115, the minimum is -32.909 and the maximum is 37.508 for GDP growth. This variation shows that the countries chosen in the South Asian region did not only go through a contraction period but also a period of strong economic growth.

The mean value of workers' remittances is 6.350, which indicates that workers' remittances are an important macroeconomic variable in the sample. The mean value of financial development is 37.846 while the mean value of human capital is 70.600 (literacy rate). The standard deviation of trade openness is high, indicating that there were significant variations between countries and years in the degree of openness of the external sector. Exchange rate also varies widely, corresponding to different values of currencies and macroeconomic conditions in the selected countries.

Panel Unit Root Test

Table 4 Fisher-Type ADF Panel Unit Root Test

Variable	Inverse chi-squared statistic	p-value	Decision at 5%
Gdp	87.1335	.0000	Stationary
Rim	22.3573	.0716	Not stationary at 5%; weak at 10%
Fd	11.9327	.6117	Not stationary
Hcap	8.9842	.8321	Not stationary
Gfcf	43.4088	.0001	Stationary
Inf	70.2753	.0000	Stationary
Fdi	26.5587	.0220	Stationary
Trade	37.8389	.0005	Stationary
Er	1.1082	1.0000	Not stationary

Note. H_0 = all panels contain unit roots. A p-value below .05 indicates rejection of the null hypothesis and supports stationarity at level.

Before estimating the panel regression model, stationarity was examined using the Fisher-type augmented Dickey-Fuller panel unit root test. The null hypothesis of this test is that all panels contain unit roots, while the alternative hypothesis is that at least one panel is stationary. Testing for stationarity is important because non-stationary variables may produce misleading regression results if not treated carefully. In panel data analysis, Fisher-type tests combine country-specific ADF test statistics and provide panel-level evidence about stationarity (Baltagi, 2005; Wooldridge, 2010).

The results in Table 4 indicate that GDP growth, gross fixed capital formation, inflation, foreign direct investment, and trade openness are stationary at level. Workers' remittances are weakly stationary at the 10 percent level based on the inverse chi-squared statistic, while financial development, human capital, and exchange rate do not reject the unit root null at level. Therefore, the results suggest mixed stationarity among the variables. Since the main model is estimated using panel data techniques and the dependent variable is GDP growth, the results are interpreted with caution and supported by diagnostic and specification tests.

Multicollinearity Test for the Main Growth Model

Table 5 Variance Inflation Factor Results for the Main Growth Model

Variable	VIF	1/VIF
Trade	4.71	0.212536
Fdi	3.15	0.317399
c_rim	2.91	0.343299
c_hcap	2.41	0.415421
c_rim_lit	2.34	0.427497
Gfcf	2.28	0.438297
Er	1.91	0.523750
Fd	1.80	0.555663
Inf	1.09	0.913552
Mean VIF	2.51	

Note. The interaction term is based on mean-centered remittances and mean-centered human capital. VIF values below 5 indicate that multicollinearity is not a serious issue in the final model.

Multicollinearity was examined using the variance inflation factor (VIF). Multicollinearity occurs when explanatory variables are highly correlated with each other, which may inflate standard errors and make coefficient estimates unstable. Since the study includes an interaction term between workers' remittances and human capital, workers' remittances and human capital were mean-centered before generating the interaction term. Mean-centering is commonly recommended in moderation analysis because it reduces non-essential multicollinearity between the original variables and their interaction term (Gujarati & Porter, 2009; Hair et al., 2010).

The VIF results reported in Table 5.3 show that all values are below 5. The highest VIF is 4.71 for trade openness, while the mean VIF is 2.51. These results indicate that multicollinearity is not a serious problem in the final growth model. Therefore, the estimated coefficients can be interpreted without major concern regarding excessive correlation among the explanatory variables.

Fixed Effects, Random Effects, and Model Selection for the Main Growth Model

Both fixed effects and random effects models were estimated to determine the appropriate panel estimation technique for the main growth model. The fixed effects model controls for unobserved time-invariant country-specific characteristics that may be correlated with the explanatory variables.

Table 6 Model Selection Results for the Main Growth Model

Test	Statistic	p-value	Decision
Hausman test	chi-square(9) = 12.34	.1946	Random effects model preferred
Fixed effects model	F(9, 166) = 5.09	.0000	Model jointly significant
Random effects model	Wald chi-square(9) = 39.15	.0000	Model jointly significant

Note. H0 of the Hausman test = random effects model is appropriate. Since $p > .05$, the random effects model is selected.

The random effects model assumes that country-specific effects are randomly distributed and not correlated with the explanatory variables. Since both approaches are based on different assumptions, the Hausman specification test was applied to choose between them (Hausman, 1978; Wooldridge, 2010). The fixed effects model produced a within R-squared of .2164 and was jointly significant, suggesting that the explanatory variables collectively explain variations in GDP growth within countries over time. However, the Hausman test result reported in Table 5.4 shows a chi-square

statistic of 12.34 with a probability value of .1946. Since the p-value is greater than .05, the null hypothesis that the random effects model is appropriate cannot be rejected. Therefore, the random effects model is selected as the final model for interpretation. This choice is consistent with the logic of panel model selection, where random effects are preferred when coefficient differences between fixed and random effects are not systematic.

Main Random Effects Regression Results

Table 5 reports the final random effects results for the main growth model. The dependent variable is GDP growth. The explanatory variables include centered workers' remittances, financial development, centered human capital, the interaction between centered remittances and centered human capital, gross fixed capital formation, inflation, foreign direct investment, trade openness, and exchange rate. The model is statistically significant at the 1 percent level, as indicated by the Wald chi-square statistic. This suggests that the explanatory variables jointly explain variations in economic growth across the selected South Asian countries.

Table 7 Final Random Effects Regression Results for the Main Growth Model

Variable	B	SE	z	p	95% CI
c_rim	0.0434	0.0912	0.48	.634	[-0.1353, 0.2221]
Fd	-0.0015	0.0274	-0.05	.957	[-0.0552, 0.0522]
c_lit	-0.0129	0.0338	-0.38	.704	[-0.0791, 0.0534]
c_rim_hcap	0.0134**	0.0064	2.10	.036	[0.0009, 0.0258]
Gfcf	0.1508***	0.0296	5.09	< .001	[0.0928, 0.2088]
Inf	-0.0743	0.0489	-1.52	.129	[-0.1702, 0.0216]
Fdi	0.6154***	0.2078	2.96	.003	[0.2081, 1.0227]
Trade	-0.0401***	0.0150	-2.67	.008	[-0.0696, -0.0107]
Er	-0.0094	0.0077	-1.22	.224	[-0.0245, 0.0057]
Constant	6.9472***	1.7238	4.03	< .001	[3.5685, 10.3259]

Note. Dependent variable = GDP growth. c_rim = centered workers' remittances; c_lit = centered human capital; c_rim_lit = centered remittances multiplied by centered human capital. ** p < .05. *** p < .01.

Discussion of Main Empirical Results

The results show that the interaction between remittances and human capital has a positive and statistically significant effect on GDP growth. This finding suggests that the effect of remittances on economic growth becomes stronger when the level of human capital increases. Gross fixed capital formation and foreign direct investment are positive and significant, indicating that investment and foreign capital inflows contribute positively to growth. Trade openness is negative and significant, suggesting that trade may have reduced growth during the sample period, possibly due to import dependence, trade deficits, or weak export competitiveness. Inflation and exchange rate have negative signs but are statistically insignificant in the final random effects model.

Workers' remittances have a positive impact on economic growth. The positive impact suggest the role remittances play in economic growth through raising household income, consumption, saving, investment and financial services. Remittances can boost growth and development in developing economies by easing household budget constraints and freeing up resources to invest in education, health, and small scale business activities (Adams & Page, 2005; Ratha, 2003).

But the fact that the coefficient is negligible indicates that, when other macroeconomic variables are accounted for, the direct impact of remittances on GDP growth is not high in the selected South Asian countries. This result accords with Barajas et al. (2009) who have suggested that the direct linkage

between remittances and economic growth is not always statistically significant, and is frequently weak. In the same way, Chami et al. (2005) had indicated that remittances may be more like compensation income than productive investment if remittance-receiving households do not invest in remittance but rather use it for consumption.

The negligible direct effect on the economy may be due to the fact that remittances are spent on household consumption, housing, education, and repayment of debts in the context of South Asia. This is not to say that remittances are not significant. Instead, it has been found to indicate their growth effect on the mediums in which they are employed. Hence, the positive and significant interaction term in this study is significant as it reveals that the impact of remittances is larger when the human capital is higher.

Impact of Financial development on economic growth but not statistically significant. As the coefficient is not significant, this should not be taken as conclusive proof that financial development is capable of dampening economic growth. Instead, the effect of financial development on GDP growth was not statistically significant. This can happen as a result of the lack of effective translation into productive credit, business investment, and inclusive financial access.

In theory, financial development is supposed to aid economic growth by enhancing the mobilization of savings, the allocation of credit, the reduction of transaction costs and the facilitation of investment (Levine, 2005). But the empirical literature also indicates that the finance-growth linkage is not always linear and uniformly positive. However, Arcand et al. (2015) suggested that financial deepening can be less or even inversely related with growth beyond a certain level. Likewise, Demetriades and Hussein (1996) discovered that the finance-growth link varies in sign and magnitude among countries. The trivial coefficient could be a symptom of financial systems' structural inefficiencies across South Asian countries, access differences in credit, financial inclusion, non-performing loans, or credit use for consumption and not investment. Thus, the importance of a country's financial development is still a topic of interest, but its direct impact on growth is related to the efficiency, stability and inclusiveness of the financial system.

The coefficient of human capital (literacy rate) is negative but statistically insignificant. This is not statistically significant, so there is not strong evidence that human capital is a negative factor in growth. Unlike with the literacy rate, the unexpected sign could be because of measurement limitations, as literacy rate measures only basic reading and writing skills, and may not adequately measure the quality of education, technical skills, labour productivity, or employability. Economic theory predicts that an increase in human capital will lead to an increase in economic growth, because well-educated people are more productive, more innovative, able to adopt new technologies, and so on. The augmented Solow model also shows that human capital accumulation plays an important role in understanding the cross-country variations in growth (Mankiw et al., 1992). Pritchett (2001) however found that indicators of education do not necessarily lead to high growth, particularly when education quality is low, and/or the labour market is not able to absorb educated workers effectively. Measurement issues could also reduce the observed link between education and economic growth (Krueger and Lindahl, 2001). The miniscule coefficient of human capital is justifiable in the case of South Asian countries. The ability of remittances to boost productivity may be indirect, and will take time, quality education, labour market opportunities and complementary institutions to make the direct impact on aggregate GDP growth. The positive and significant remittances-human capital interaction supports this interpretation.

The interaction between the centered workers' remittances and the centered human capital is positive and statistically significant at the 5 percent level. This is one of the most significant results of the research. The positive sign means that people's capital enhances the link between remittances and

economic growth. That is, the economic growth promoting effect of remittances is more likely to occur with an increase in the literacy of the population and the human capital.

This finding is consistent with the mediated moderation hypothesis of the study. While, in some cases, remittances will not produce any significant growth effect, in others it will have a more productive impact when households and economies have the ability to make good use of the inflows. The economic returns for literate households are likely to be higher for remittances to be invested in skills, small businesses, savings, and productive assets. They may also be more likely to be connected to formal sources of finance and to invest their remittance money in improving their economic situation in the long run. This result is in line with the wider absorptive-capacity literature. Borensztein et al. (1998) suggested that the growth impact of foreign capital is shaped by the host countries' human capital. Likewise, Giuliano and Ruiz-Arranz (2009) demonstrated that remittances can boost growth under specific conditions of the financial sector. The significant interaction implies that human capital is a condition with respect to which remittances are more growth-enhancing.

The coefficient of gross fixed capital formation is positive and statistically significant at 1 percent level of significance. This outcome is well in line with the theory of the economy. It suggests a positive effect of capital formation on the GDP growth of the selected South Asian economies. Capital involved in capital formation is the investment which is made in the machines, equipment, infrastructure, buildings, etc., which increases the productive capacity.

Neoclassical growth theory is based on the positive correlation between capital accumulation and growth. Solow (1956) stressed that capital accumulation is one of the main sources of output growth and Mankiw et al. (1992) demonstrated that cross-country growth differences can be explained by differences in physical and human capital. Infrastructure and productive capital investment is particularly crucial in developing economies, as it helps to lower production expenses, increase industrial capacity and generate jobs. It is observed in this study that gross fixed capital formation has a high importance score, indicating that domestic investments are one of the important factors of growth in South Asian region. The result also reinforces the proposal that remittances can make a greater impact on growth if they are directed toward productive investment as opposed to consumption only. Hence, policies that can shift remittance inflows towards saving and investment, as well as into entrepreneurship, can enhance remittance growth's effect on growth.

Impact of inflation on economic growth is negative. The negative sign corresponds with the economic theory: when inflation is high, the purchasing power is lowered, uncertainty is raised, and investment is lowered and economic performance is weakened. This rise in the inflation rate can also impact the purchasing power of the population and the cost of credit, potentially influencing investment and consumption decisions.

The negative link between inflation and growth can be supported with Fischer (1993) who stated that macroeconomic instability such as high inflation has negative impact on the growth performance. Also, Barro (1995) discovered a negative correlation between inflation and economic growth in the longer term. In developing countries inflation can have a particularly adverse impact as its impact on poor households is greater, and as it makes trade, investment and exchange rate markets uncertain.

Foreign direct investment positively and significantly affects GDP growth. This finding suggests that FDI inflows have positive effect on the economic growth in the economies of the selected South Asian countries. FDI can contribute to growth in a variety of ways including capital inflows, technology transfer, employment effects, human resource management skills, export expansion and productivity enhancement.

This outcome is in line with Borensztein et al. (1998), who believe that FDI can boost the growth of a host country economy by providing technology and productivity gains, especially when the host

economy is absorptive. Alfaro et al. (2004) further argued that the growth impact of FDI is also related to local financial markets, as financial markets if developed enable allocation of foreign capital to productive activities. In the context of South Asia, FDI can contribute to growth by enhancing the industrial capacity, infrastructure and external competitiveness of the countries. This study has resulted in a positive and significant coefficient; this implies that foreign investment is complementary in the growth process. The long-term effects of FDI are however dependent on whether it is channeled into productive sectors or speculative/low value-added sectors. Thus, policy should be oriented to the attraction of quality FDI for industrial development and technology transfer and job creation.

Trade openness is negatively related to the dependent variable and significant. This is a finding that goes against the conventional theory of trade-driven growth which posits that openness of trade facilitates growth through specialization, competition, technology transfer and access to larger markets. But in the case of developing and import-dependent economies, the negative sign may be economically acceptable.

In South Asian countries, trade openness can hurt growth when imports are growing more rapidly than exports; when domestic industries in the country are underdeveloped; and when reliance on intermediate and capital goods imports is high. As a result, the more open the economy, the more trade deficits, foreign exchange pressures, and susceptibility to external shocks can result. Kim et al. (2011) revealed that a nonlinear relation between trade openness and development may exist; that is, trade does not always pay off at every level of development. Additionally, trade openness can influence in different ways as a result of the level of economic development and structural capacity, as found by Zahanogo (2016).

Thus, it is not correct to say that the negative trade coefficient indicates in all cases the harmful nature of trade. Instead, it implies the gains from openness relies on export competitiveness, domestic productive capacity, industrial policy, and the composition of trade. Trade openness could help the growth of South Asian economies, but only as long as there is export diversification, value addition, and an improvement in domestic industries.

The coefficient for 'exchange rate' is negative but not statistically significant in the final random effects model. The coefficient is not statistically significant, but the negative sign has economic significance (and is consistent with the macroeconomic structure of many developing economies). Exchange rate fluctuations affect economic growth in various ways, such as the prices of imports and inflation, competitiveness in export markets, external debt burden, remittance value, and investor confidence.

In an economy that uses the exchange rate in terms of domestic currency per unit of U.S. currency, a rise in the exchange rate typically is a fall in the value of the domestic currency. In theory, in an export oriented economy, the depreciation of currency can improve the competitiveness of export products, while in an import dependent economy, the effect can be to make the imported fuel, machinery, raw materials, food, and intermediate products more costly. If production relies heavily on imported inputs, depreciation can raise production costs and can even decrease the growth of production. This channel is especially significant for the economies of South Asia, where external financing requirements, industrial inputs, and energy imports are significant determinants of economic performance.

The inflation channel is another way to interpret the negative exchange rate coefficient. If depreciation increases the cost of imported goods, it could cause cost-push inflation and raise the cost of these imports. Faster inflation erodes the purchasing power of households and causes investors uncertainty. When firms start to encounter increasing prices and higher import costs, they may decrease investment, postpone production decisions, or push up prices to consumers. This reduces the growth process. Fisher (1993) and Barro (1995) demonstrated that the state of macroeconomic instability,

such as the inflationary pressure, can adversely influence the economic growth. There is an economic rationale for a negative exchange rate-growth relationship because a depreciation of the exchange rate may inflate the economy.

Outside debt and balance-of-payments pressures are another very important channel. It is a well-known fact that many developing economies borrow in foreign currencies. When the domestic currency depreciates, the local currency value of foreign debt payments increases. This puts strain on the foreign exchange reserves as well as the government's budget. Ability to service debt can help to lower investment in infrastructure, education and development programmes, which can have a negative effect on long-term growth. Instability in exchange rates can also deter foreign investors as it can lead to the risk of uncertain returns. Aghion et al. (2009) have shown that currency volatility may inhibit productivity gains, particularly in less developed financial markets. In this study, the insignificant p-value indicates that the negative exchange rate effect is not statistically significant after controlling for remittances, financial development, human capital, investment, inflation, FDI and trade openness. This can be due to indirect transmission via channels of inflation, trade and investment. It could also be due to the different exchange rate policies, import dependency, export composition and reaction to monetary policy adopted in different countries. Thus, it should be mentioned in the final model that the result is statistically insignificant but still economically relevant.

The empirical indicators of the final model of the random effects and their relationship with economic theory and the previous empirical studies. This table is intended to illustrate both the theoretical consistency of the estimated coefficients and the justification of unexpected signs. Overall, the findings are in line with economic theory. The interaction term gross fixed capital formation and foreign direct investment are positive and significant while the signs of inflation and exchange rate are negative. The negative and significant coefficient of trade openness is warranted by importance of imports and export competitiveness in developing economies.

The main growth results provide partial support for the theoretical framework of the study. The direct effect of workers' remittances on GDP growth is positive but insignificant, suggesting that remittances alone do not generate a strong direct growth effect in the selected South Asian economies. However, the interaction between remittances and human capital is positive and significant, indicating that human capital strengthens the remittance-growth relationship. This finding supports the moderated relationship proposed in the study.

The control variables also provide important insights. Gross fixed capital formation and foreign direct investment are positive and significant, confirming the importance of domestic investment and foreign capital inflows in economic growth. Inflation and exchange rate have negative signs, which are consistent with macroeconomic theory, although they are statistically insignificant. Trade openness is negative and significant; suggesting that trade openness may not automatically promote growth unless supported by export capacity and productive competitiveness.

5. Mediation Equation Results

This section presents the results of the mediation equation used to examine whether workers' remittances influence financial development in selected South Asian economies. In the mediated moderation framework of the study, financial development is treated as the mediating channel through which remittance inflows may affect economic growth. Therefore, before interpreting the complete remittance-growth relationship, it is necessary to test whether remittances significantly affect financial development. This follows the logic of mediation analysis, which requires evidence that the independent variable has a meaningful effect on the proposed mediator before the indirect pathway can be discussed (Baron & Kenny, 1986; Hayes, 2018).

The mediation equation uses financial development as the dependent variable. Workers' remittances are the main explanatory variable, while gross fixed capital formation, inflation, foreign direct investment, trade openness, exchange rate, and literacy are included as control variables. The purpose of this equation is not to estimate economic growth directly; rather, it examines whether remittance inflows contribute to the development of financial institutions and credit markets. This distinction is important because GDP is used as the dependent variable in the main growth model, whereas financial development is used as the dependent variable in the mediation equation.

Multicollinearity Diagnostic for the Mediation Equation

Before estimating the mediation equation, the variance inflation factor test was applied to examine whether multicollinearity existed among the explanatory variables.

Table 8 Variance Inflation Factor Results for the Mediation Equation

Variable	VIF	1/VIF
Trade openness	4.43	0.2257
Foreign direct investment	2.61	0.3828
Literacy	2.17	0.4609
Gross fixed capital formation	2.13	0.4686
Exchange rate	1.84	0.5424
Workers' remittances	1.28	0.7792
Inflation	1.06	0.9408
Mean VIF	2.22	

Note. VIF = variance inflation factor. Values below 5 indicate that serious multicollinearity is not present in the mediation equation.

The results show that all VIF values are below the commonly accepted threshold of 5. The highest VIF value is 4.43 for trade openness, while the mean VIF is 2.22. These results indicate that multicollinearity is not a serious problem in the mediation equation. Therefore, the explanatory variables can be included in the model without concern for severe multicollinearity. This strengthens the reliability of the estimated coefficients in the financial development equation (Gujarati & Porter, 2009; Hair et al., 2010).

Hausman Specification Test for the Mediation Equation

After confirming that multicollinearity was not a serious issue, the Hausman specification test was applied to select the appropriate panel estimation technique for the mediation equation.

Table 9 Hausman Test Results for the Mediation Equation

Test statistic	Result
Chi-square statistic	17.38
Degrees of freedom	7
Probability value	.0151
Decision	Fixed effects model selected

Note. The null hypothesis states that the random effects model is appropriate. Since $p = .0151$, the null hypothesis is rejected and fixed effects is preferred.

The Hausman test compares fixed effects and random effects estimators. The null hypothesis states that the random effects model is appropriate, whereas the alternative hypothesis supports the fixed effects model. If the probability value is below .05, the null hypothesis is rejected and the fixed effects model is preferred (Hausman, 1978; Wooldridge, 2010).

The Hausman test results in Table 5.9 show a chi-square value of 17.38 with a probability value of .0151. Since the probability value is less than .05, the null hypothesis is rejected. Therefore, the fixed

effects model is considered more appropriate than the random effects model for estimating the mediation equation. This result implies that unobserved country-specific factors are systematically related to the explanatory variables in the financial development equation. Consequently, the interpretation of the mediation equation is based on the fixed effects results.

Fixed Effects Results for the Mediation Equation

Table 10 Fixed Effects Results for the Mediation Equation

Variable	B	SE	t	p	95% CI
Workers' remittances	1.608	0.299	5.39	< .001	[1.019, 2.198]
Gross fixed capital formation	-0.085	0.077	-1.09	.276	[-0.238, 0.068]
Inflation	-0.011	0.111	-0.10	.921	[-0.230, 0.208]
Foreign direct investment	0.963	0.650	1.48	.140	[-0.320, 2.247]
Trade openness	0.019	0.072	0.26	.793	[-0.124, 0.162]
Exchange rate	0.010	0.019	0.52	.602	[-0.027, 0.047]
Literacy	0.766	0.128	5.96	< .001	[0.512, 1.019]
Constant	-29.633	10.055	-2.95	.004	[-49.483, -9.782]

Note. Dependent variable = financial development. Number of observations = 182. Number of groups = 7. Within $R^2 = .4373$. $F(7, 168) = 18.65$, $p < .001$. The fixed effects model was selected based on the Hausman specification test.

Interpretation of the Mediation Equation

The fixed effects model was estimated to examine the effect of workers' remittances on financial development. The model is statistically significant overall, as shown by the F-statistic of 18.65 and probability value of .0000. This indicates that the explanatory variables jointly explain significant variation in financial development. The within R-square value is .4373, which means that approximately 43.73% of the within-country variation in financial development is explained by the model. The coefficient of workers' remittances is positive and statistically significant at the 1 percent level ($B = 1.608$, $p < .001$). This result indicates that an increase in workers' remittances is associated with an increase in financial development, holding other variables constant. The positive coefficient supports the argument that remittance inflows may contribute to the development of financial institutions and credit markets by increasing bank deposits, savings, liquidity, and the use of formal financial services. This finding is consistent with the remittance-finance literature, which suggests that remittances can strengthen financial development when they are transferred through formal financial channels and absorbed by the banking system (Giuliano & Ruiz-Arranz, 2009). It is also consistent with the broader finance-growth view that financial systems support development by mobilizing savings, allocating credit, and improving the efficiency of investment (King & Levine, 1993; Levine, 2005).

The positive and significant coefficient of workers' remittances confirms the first stage of the mediation mechanism. In other words, the result provides empirical support for the pathway from workers' remittances to financial development. This means that remittance inflows do not only function as household income; they may also contribute to the formal financial system when recipients use banks, savings accounts, credit markets, and other financial services. In the context of South Asian economies, where remittances represent an important external source of finance, this result is particularly meaningful because it shows that remittances can help deepen the financial sector.

The coefficient of literacy is also positive and statistically significant at the 1 percent level ($B = 0.766$, $p < .001$). This result indicates that higher literacy is associated with higher financial development. The finding suggests that human capital is important for improving the use of financial services

because literate individuals are more likely to understand financial information, access banking services, save formally, and make better investment decisions. This result is consistent with human capital theory, which argues that education, knowledge, and skills improve productivity and economic decision-making (Becker, 1964; Lucas, 1988). Therefore, literacy strengthens the economic environment in which remittances can be used more productively.

Gross fixed capital formation has a negative but statistically insignificant coefficient ($B = -0.085$, $p = .276$). This means that, in the mediation equation, capital formation does not have a statistically strong effect on financial development. Although investment is theoretically expected to increase demand for financial services, the insignificant result suggests that the effect is not strong enough in this sample after controlling for country-specific effects and other macroeconomic variables.

Inflation also has a negative and statistically insignificant coefficient ($B = -0.011$, $p = .921$). The negative sign is consistent with the expectation that inflation may weaken financial development by reducing purchasing power, discouraging savings, and creating uncertainty. However, the insignificant p-value shows that inflation does not have a statistically meaningful effect on financial development in this fixed effects mediation model.

Foreign direct investment has a positive but statistically insignificant coefficient ($B = 0.963$, $p = .140$). The positive sign suggests that FDI may be associated with improvements in financial development through capital inflows, business expansion, and demand for financial services. However, the insignificant result indicates that the effect is not statistically confirmed in the current mediation equation. Similarly, trade openness has a positive but statistically insignificant coefficient ($B = 0.019$, $p = .793$), suggesting that trade integration does not have a strong direct association with financial development in this model.

The exchange rate coefficient is positive but statistically insignificant ($B = 0.010$, $p = .602$). This indicates that exchange rate movements do not have a statistically significant effect on financial development in the mediation equation. Although exchange rate changes may influence the domestic value of remittance inflows, import costs, and financial confidence, the results do not provide sufficient evidence that exchange rate variations directly explain financial development in the selected South Asian economies.

Overall, the mediation equation provides strong evidence that workers' remittances have a positive and significant effect on financial development. This supports the first path of the mediation framework, namely the relationship between remittances and the mediating variable. The result suggests that remittance inflows can contribute to financial-sector development by increasing financial activity, encouraging the use of formal banking channels, and improving the availability of funds in the financial system.

However, this result should be interpreted carefully. The mediation equation confirms only the first stage of mediation. To establish complete mediation, the main growth equation must also show whether financial development has a significant effect on economic growth after controlling for workers' remittances and other macroeconomic variables (Baron & Kenny, 1986; Hayes, 2018). In the main growth model, financial development has a negative but statistically insignificant coefficient. Therefore, the evidence supports the remittances-to-financial-development pathway, but it does not provide strong evidence that financial development fully transmits the effect of remittances to GDP growth in the selected South Asian economies.

This finding is important for the thesis because it shows that remittances can improve financial development, but the financial sector may not yet be sufficiently efficient, inclusive, or productive to convert this improvement into higher GDP growth. In other words, the first stage of mediation is supported, while the full mediating role of financial development is not strongly supported by the main

growth equation. The stronger empirical evidence in this study is found for the moderating role of human capital, as the interaction between remittances and literacy is positive and significant in the main growth model.

Integrated Discussion of Main and Mediation Results

The combined interpretation of the main growth equation and the mediation equation provides a clearer understanding of the remittance-growth relationship in South Asia. The main random effects model shows that workers' remittances have a positive but insignificant direct effect on GDP growth. This suggests that remittances alone may not be sufficient to generate strong aggregate growth effects. However, the mediation equation shows that workers' remittances have a positive and significant effect on financial development. This means that remittances contribute to the financial system, even if the financial development variable does not show a statistically significant direct effect on GDP growth in the final growth equation.

The results therefore provide partial support for the mediated moderation framework. The first stage of mediation is supported because remittances significantly improve financial development. However, complete mediation through financial development is not strongly supported because financial development is insignificant in the GDP growth equation. This implies that the financial system in the selected South Asian economies may receive benefits from remittance inflows, but these benefits may not automatically translate into higher growth unless financial institutions allocate remittance-based liquidity toward productive credit, entrepreneurship, and investment.

The strongest evidence is related to the moderating role of human capital. The interaction between workers' remittances and literacy is positive and significant, indicating that human capital strengthens the growth effect of remittances. At the same time, the mediation equation shows that literacy also has a positive and significant effect on financial development. Taken together, these findings suggest that education and literacy improve both the productive use of remittances and participation in formal financial systems. Therefore, human capital is a key condition that allows remittances to become more growth-enhancing.

From a policy perspective, the findings indicate that South Asian economies should not depend only on the volume of remittance inflows. Instead, policies should focus on improving the channels through which remittances are used. This includes strengthening formal banking channels, improving financial inclusion, expanding access to credit for small businesses, and increasing literacy and financial awareness among remittance-receiving households. If remittances are used mainly for consumption, their direct growth effect may remain weak. However, if they are combined with human capital development and efficient financial intermediation, their contribution to long-run economic growth can become stronger.

6. CONCLUSION AND POLICY RECOMMENDATIONS

The purpose of this study was to study the mediated moderation impact of workers remittances on economic growth in selected South Asian Economies. This analysis was undertaken on the basis of the panel data of seven countries of South Asia for a period of 26 years from 2000 to 2025. The main growth model was run with economic growth as the dependent variable and workers' remittances as the main explanatory variable. Financial development was tested as the mediator between the other variables, and human capital (measured in the form of the literacy rate) was tested as the moderator between the other variables. To reflect the wider macroeconomic environment, gross fixed capital formation, inflation, foreign direct investment, trade openness and exchange rate were used as control variables.

It was found that there were significant differences across the selected South Asian countries regarding economic growth, remittances receipts, financial development, literacy, trade openness, FDI inflows,

inflation, exchange rate and capital formation. This variation is an additional evidence of the appropriateness of using panel data analysis as the data includes both country and time variations. The unit root test was mixed stationary among the variables and variance inflation factor test did not reveal serious multicollinearity between variables in the final growth model after mean centering workers' remittances and literacy before forming the interaction term. The Hausman specification test for the primary growth model confirmed that the random effects model is the right estimation method. The final random effects results showed that workers' remittances had a positive but statistically insignificant direct effect on GDP growth. This suggests that remittances can have a positive impact on economic growth, but in the absence of other macroeconomic controls, the direct impact of remittances was not statistically significant. This clearly implies that remittances do not necessarily translate into economic growth without making them productive and accessible to the finance, investment opportunities, and human capital development.

In the primary model, the impact of financial development on economic growth was negative, but not statistically significant. The results are not statistically significant and so cannot be taken as convincing evidence that financial development has a negative effect on growth. Instead, the study period saw no clear and reliable positive relationship between financial development and economic growth in the economies of the selected South Asian countries. This could be because of financial sector weaknesses, credit access inequities, financial resources allocation inefficiencies, lack of financial inclusion and/or credit usage for consumption instead of productive investments. The literacy rate was also a negative but not statistically significant direct effect on GDP growth; that is, human capital was not measured. This finding does not impugn the significance of human capital, since literacy is a basic measure that could not necessarily represent education quality, technical skills, labor productivity or employment absorption. Thus, the negligible direct impact of literacy could be due to measurement and structural constraints in the South Asian labour market. The role of human capital in growth may be stronger in combination with other economic determinants like remittances, financial development, entrepreneurship and productive investment.

The most important finding of the main growth model was the positive and statistically significant interaction between workers' remittances and human capital. This finding is in line with the moderating effect of human capital in remittance-growth relationship. It suggests that higher education and human capital levels have a positive relationship with remittances' contribution to economic growth. In terms of the actual use of remittances, remittance-receiving households with higher education and awareness are more likely to save, invest, educate, start a business, and otherwise use their remittances for productive purposes. Hence, human capital boosts the capacity of remittance-receiving economies to channel the remittance inflows into growth-enhancing activities.

The analysis also demonstrated that Gross fixed capital formation has a positive and significant impact on GDP growth. This reflects the significance of domestic investments and accumulation of capital in the process of economic development. Investment in productive assets such as machinery, infrastructure, equipment, buildings and productive assets increases the productive capacity of the economy and plays a supporting role in employment generation. As in the case of GDP growth, foreign direct investment was also found to have a positive and statistically significant influence on economic growth, indicating that foreign capital inflows can positively impact economic growth by fostering technology transfer, managerial skills, job creation and enhancement of productivity.

Economic growth was negatively and significantly related to trade openness. While trade openness is generally believed to foster growth via market access, competition, specialization and technology transfer, it is possible to understand the negative result in the light of the nature of the South Asian economies. Increased trade openness can lead to trade deficits, dependence on foreign trade, and

foreign exchange pressure if imports are greater than exports or if domestic industries are relatively weak and less competitive. Hence, the gains to be reaped from trade openness are reliant on export competitiveness, value addition, industrial capacity and trade policy effectiveness.

There was a negative but statistically-unimportant effect of inflation and exchange rate on GDP growth. All the minus signs suggest that macroeconomic instability can affect growth by reducing the purchasing power, so avoiding investment, raising production costs and causing uncertainty. The study does not however make any strong assertion of the independent impact of inflation or exchange rate on the growth of GDP, as both these variables were statistically insignificant. Rather, these variables are still relevant controls since they are indicators of the macroeconomic stability and external-sector conditions of the remittance-growth nexus.

The financial development equation was estimated separately with financial development as the dependent variable. The Hausman test performed for mediation equation agreed with the fixed effects model. The fixed effects results showed that workers' remittances had a positive and statistically significant effect on financial development. This is the first step to the mediation mechanism, which is confirmed by this finding. It suggests that remittance inflows have a positive effect upon financial development, reflected in the financialization of certain activities, such as saving, bank deposits, liquidity, and credit market operations. The positive and statistically significant impact of literacy on financial development indicated that human capital contributes to financial awareness, and thereby enhances the use of banking and financial services.

The overall findings support partially the mediated moderation model. The direct effect of workers' remittances on economic growth was positive although not statistically significant, but the remittance-human capital interaction was positive and significant. In the mediation model, remittances have significant positive effects on financial development, while the latter did not have any significant direct effect on GDP growth. Based on this study, it can be concluded that the growth of remittances has implications for South Asian economies, but those implications rely on complementary factors like human capital development, productive investment, effective financial intermediation and macroeconomic stability.

The study's final finding is that the remittances of workers should not be solely considered as sources of income or consumption for households. They should be viewed as a possible developmental resource that, with proper policies, can facilitate growth of the financial sector, investments, entrepreneurship and long-term growth of the sector. South Asian economies could benefit more from remittances by enhancing human capital, increasing financial inclusion, lowering the cost of remittance transfer, encouraging savings and investment products for migrants, and directing remittance inflows towards productive sectors.

Policymakers in South Asian economies should promote the productive utilization of remittance inflows by strengthening efficient financial intermediation and improving access to formal financial services. At the same time, greater investment in human capital, particularly education and skill development, can enhance the capacity of recipient economies to transform remittances into productive investment and sustainable economic growth.

References

- Acosta, P. A., Lartey, E. K. K., & Mandelman, F. S. (2009). Remittances and the Dutch disease. *Journal of International Economics*, 79(1), 102-116. <https://doi.org/10.1016/j.jinteco.2009.06.007>
- Adams, R. H., Jr., & Page, J. (2005). Do international migration and remittances reduce poverty in developing countries? *World Development*, 33(10), 1645-1669. <https://doi.org/10.1016/j.worlddev.2005.05.004>
- Aggarwal, R., Demirguc-Kunt, A., & Martinez Peria, M. S. (2011). Do remittances promote financial development? *Journal of Development Economics*, 96(2), 255-264. <https://doi.org/10.1016/j.jdeveco.2010.10.005>
- Aghion, P., Bacchetta, P., Ranciere, R., & Rogoff, K. (2009). Exchange rate volatility and productivity growth: The role of financial development. *Journal of Monetary Economics*, 56(4), 494-513. <https://doi.org/10.1016/j.jmoneco.2009.03.015>
- Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and economic growth: The role of local financial markets. *Journal of International Economics*, 64(1), 89-112. [https://doi.org/10.1016/S0022-1996\(03\)00081-3](https://doi.org/10.1016/S0022-1996(03)00081-3)
- Arcand, J. L., Berkes, E., & Panizza, U. (2015). Too much finance? *Journal of Economic Growth*, 20(2), 105-148. <https://doi.org/10.1007/s10887-015-9115-2>
- Baltagi, B. H. (2005). *Econometric analysis of panel data* (3rd ed.). John Wiley & Sons.
- Barajas, A., Chami, R., Fullenkamp, C., Gapen, M., & Montiel, P. (2009). Do workers' remittances promote economic growth? IMF Working Paper No. 09/153. International Monetary Fund.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173-1182. <https://doi.org/10.1037/0022-3514.51.6.1173>
- Barro, R. J. (1991). Economic growth in a cross section of countries. *The Quarterly Journal of Economics*, 106(2), 407-443. <https://doi.org/10.2307/2937943>
- Barro, R. J. (1995). Inflation and economic growth. *Bank of England Quarterly Bulletin*, 35(2), 166-176.
- Beck, T., Levine, R., & Loayza, N. (2000). Finance and the sources of growth. *Journal of Financial Economics*, 58(1-2), 261-300. [https://doi.org/10.1016/S0304-405X\(00\)00072-6](https://doi.org/10.1016/S0304-405X(00)00072-6)
- Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press.
- Benhabib, J., & Spiegel, M. M. (1994). The role of human capital in economic development: Evidence from aggregate cross-country data. *Journal of Monetary Economics*, 34(2), 143-173. [https://doi.org/10.1016/0304-3932\(94\)90047-7](https://doi.org/10.1016/0304-3932(94)90047-7)
- Bettin, G., & Zazzaro, A. (2012). Remittances and financial development: Substitutes or complements in economic growth? *Bulletin of Economic Research*, 64(4), 509-536. <https://doi.org/10.1111/j.1467-8586.2011.00398.x>
- Borensztein, E., De Gregorio, J., & Lee, J. W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics*, 45(1), 115-135. [https://doi.org/10.1016/S0022-1996\(97\)00033-0](https://doi.org/10.1016/S0022-1996(97)00033-0)
- Brambor, T., Clark, W. R., & Golder, M. (2006). Understanding interaction models: Improving empirical analyses. *Political Analysis*, 14(1), 63-82. <https://doi.org/10.1093/pan/mpi014>

- Brida, J. G., Cortes-Jimenez, I., & Pulina, M. (2013). The role of physical and human capital in tourism and economic growth: A dynamic model. *Tourism Economics*, 19(5), 1021-1039. <https://doi.org/10.5367/te.2013.0237>
- Catrinescu, N., Leon-Ledesma, M., Piracha, M., & Quillin, B. (2009). Remittances, institutions, and economic growth. *World Development*, 37(1), 81-92. <https://doi.org/10.1016/j.worlddev.2008.02.004>
- Chami, R., Fullenkamp, C., & Jahjah, S. (2005). Are immigrant remittance flows a source of capital for development? *IMF Staff Papers*, 52(1), 55-81.
- Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance*, 20(2), 249-272. [https://doi.org/10.1016/S0261-5606\(00\)00048-6](https://doi.org/10.1016/S0261-5606(00)00048-6)
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Lawrence Erlbaum Associates.
- Cooray, A. (2012). Migrant remittances, financial sector development and the government ownership of banks: Evidence from a group of non-OECD economies. *Journal of International Financial Markets, Institutions and Money*, 22(4), 936-957. <https://doi.org/10.1016/j.intfin.2012.05.006>
- Demetriades, P. O., & Hussein, K. A. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of Development Economics*, 51(2), 387-411. [https://doi.org/10.1016/S0304-3878\(96\)00421-X](https://doi.org/10.1016/S0304-3878(96)00421-X)
- Dollar, D., & Kraay, A. (2004). Trade, growth, and poverty. *The Economic Journal*, 114(493), F22-F49. <https://doi.org/10.1111/j.0013-0133.2004.00186.x>
- Fayissa, B., & Nsiah, C. (2010). The impact of remittances on economic growth and development in Africa. *The American Economist*, 55(2), 92-103. <https://doi.org/10.1177/056943451005500210>
- Fischer, S. (1993). The role of macroeconomic factors in growth. *Journal of Monetary Economics*, 32(3), 485-512. [https://doi.org/10.1016/0304-3932\(93\)90027-D](https://doi.org/10.1016/0304-3932(93)90027-D)
- Frankel, J. A., & Romer, D. H. (1999). Does trade cause growth? *American Economic Review*, 89(3), 379-399. <https://doi.org/10.1257/aer.89.3.379>
- Giuliano, P., & Ruiz-Arranz, M. (2009). Remittances, financial development, and growth. *Journal of Development Economics*, 90(1), 144-152. <https://doi.org/10.1016/j.jdeveco.2008.10.005>
- Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.). McGraw-Hill.
- Guo, Q., Chen, J., Xiao, H., & Mouneer, S. (2022). Foreign inflows, commercial law, and dutch disease: Evidence from developing economies. *Frontiers in Environmental Science*, 10, Article 945453. <https://doi.org/10.3389/fenvs.2022.945453> (Retracted article)
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Pearson.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage.
- Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica*, 46(6), 1251-1271. <https://doi.org/10.2307/1913827>
- Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). Guilford Press.
- Hien, N. P., Hong Vinh, C. T., Phuong Mai, V. T., & Kim Xuyen, L. T. (2020). Remittances, real exchange rate and the Dutch disease in Asian developing countries. *The Quarterly Review of Economics and Finance*, 77, 131-143. <https://doi.org/10.1016/j.qref.2019.10.006>

- Hsiao, C. (2003). *Analysis of panel data* (2nd ed.). Cambridge University Press.
- Islam, S. B., & Mondal, L. (2023). An empirical analysis on remittances and financial development in Latin American countries. *arXiv*. <https://arxiv.org/abs/2309.08855>
- Jawaid, S. T., & Raza, S. A. (2012). Workers' remittances and economic growth in China and Korea: An empirical analysis. *Journal of Chinese Economic and Foreign Trade Studies*, 5(3), 185-193. <https://doi.org/10.1108/17544401211263946>
- Jongwanich, J. (2007). Workers' remittances, economic growth and poverty in developing Asia and the Pacific countries. United Nations Economic and Social Commission for Asia and the Pacific Working Paper WP/07/01.
- Kim, D. H., Lin, S. C., & Suen, Y. B. (2011). Nonlinearity between trade openness and economic development. *Review of Development Economics*, 15(2), 279-292. <https://doi.org/10.1111/j.1467-9361.2011.00608.x>
- King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, 108(3), 717-737. <https://doi.org/10.2307/2118406>
- Krueger, A. B., & Lindahl, M. (2001). Education for growth: Why and for whom? *Journal of Economic Literature*, 39(4), 1101-1136. <https://doi.org/10.1257/jel.39.4.1101>
- Lartey, E. K. K., Mandelman, F. S., & Acosta, P. A. (2012). Remittances, exchange rate regimes and the Dutch disease: A panel data analysis. *Review of International Economics*, 20(2), 377-395. <https://doi.org/10.1111/j.1467-9396.2012.01028.x>
- Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature*, 35(2), 688-726.
- Levine, R. (2005). Finance and growth: Theory and evidence. In P. Aghion & S. N. Durlauf (Eds.), *Handbook of economic growth* (Vol. 1A, pp. 865-934). Elsevier. [https://doi.org/10.1016/S1574-0684\(05\)01012-9](https://doi.org/10.1016/S1574-0684(05)01012-9)
- Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, 46(1), 31-77. [https://doi.org/10.1016/S0304-3932\(00\)00017-9](https://doi.org/10.1016/S0304-3932(00)00017-9)
- Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3-42. [https://doi.org/10.1016/0304-3932\(88\)90168-7](https://doi.org/10.1016/0304-3932(88)90168-7)
- Maddala, G. S., & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics*, 61(S1), 631-652. <https://doi.org/10.1111/1468-0084.0610s1631>
- Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics*, 107(2), 407-437. <https://doi.org/10.2307/2118477>
- Meyer, D., & Shera, A. (2017). The impact of remittances on economic growth: An econometric model. *EconomiA*, 18(2), 147-155. <https://doi.org/10.1016/j.econ.2016.06.001>
- Mundaca, B. G. (2009). Remittances, financial market development, and economic growth: The case of Latin America and the Caribbean. *Review of Development Economics*, 13(2), 288-303. <https://doi.org/10.1111/j.1467-9361.2008.00487.x>
- O'Brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. *Quality & Quantity*, 41(5), 673-690. <https://doi.org/10.1007/s11135-006-9018-6>
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879-891. <https://doi.org/10.3758/BRM.40.3.879>
- Pritchett, L. (2001). Where has all the education gone? *The World Bank Economic Review*, 15(3), 367-391. <https://doi.org/10.1093/wber/15.3.367>

- Rajan, R. G., & Subramanian, A. (2011). Aid, Dutch disease, and manufacturing growth. *Journal of Development Economics*, 94(1), 106-118. <https://doi.org/10.1016/j.jdevco.2009.12.004>
- Rao, B. B., & Hassan, G. M. (2011). A panel data analysis of the growth effects of remittances. *Economic Modelling*, 28(1-2), 701-709. <https://doi.org/10.1016/j.econmod.2010.05.011>
- Ratha, D. (2003). Workers' remittances: An important and stable source of external development finance. In *Global development finance 2003* (pp. 157-175). World Bank.
- Rodrik, D. (2008). The real exchange rate and economic growth. *Brookings Papers on Economic Activity*, 2008(2), 365-412. <https://doi.org/10.1353/eca.0.0020>
- Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy*, 98(5, Part 2), S71-S102. <https://doi.org/10.1086/261725>
- Schumpeter, J. A. (1934). *The theory of economic development*. Harvard University Press.
- Siddique, A., Selvanathan, E. A., & Selvanathan, S. (2012). Remittances and economic growth: Empirical evidence from Bangladesh, India and Sri Lanka. *Journal of Development Studies*, 48(8), 1045-1062. <https://doi.org/10.1080/00220388.2012.663904>
- Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, 70(1), 65-94. <https://doi.org/10.2307/1884513>
- Stark, O., & Bloom, D. E. (1985). The new economics of labor migration. *The American Economic Review*, 75(2), 173-178.
- Su, Y., & Liu, Z. (2016). The impact of foreign direct investment and human capital on economic growth: Evidence from Chinese cities. *China Economic Review*, 37, 97-109. <https://doi.org/10.1016/j.chieco.2015.12.007>
- Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data* (2nd ed.). MIT Press.
- World Bank. (2026). *World Development Indicators*. World Bank DataBank. Retrieved May 10, 2026, from <https://databank.worldbank.org/source/world-development-indicators>
- Xu, Y., & Li, A. (2020). The relationship between innovative human capital and interprovincial economic growth based on panel data model and spatial econometrics. *Journal of Computational and Applied Mathematics*, 365, Article 112381. <https://doi.org/10.1016/j.cam.2019.112381>
- Zahonogo, P. (2016). Trade and economic growth in developing countries: Evidence from sub-Saharan Africa. *Journal of African Trade*, 3(1-2), 41-56. <https://doi.org/10.1016/j.joat.2017.02.001>