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### Remittances, Foreign Direct Investment, and Economic Growth in Pakistan: A Time Series Analysis

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### Abstract

This study determines the remittance inflow and focuses on the economic and institutional determinants of remittance inflows in terms of identifiable factors; whose determinant is gross domestic product per capita, foreign direct investment, trade openness, gross fixed capital formation (GFCF), government stability and political Stability. The Augmented Dickey-Fuller test and ordinary least squares estimation are performed on time-series data from 2000 to 2021. The results obtained from the regression demonstrate that GDP per capita, domestic investment, external trade liberalization and government stability positively influence remittance receipt flows. Trade openness has the largest statistical effect, stressing the relevance of international economic integration, dynamic transmission mechanisms through sound financial systems as well as open

channels for formal transfers. However, gross fixed capital formation and political stability are also positively related with remittances but the results are insignificant. This study finds that remittance inflows respond to household support needs, as well as domestic growth prospects, investment climate conditions and public institutions credibility. In this regard, policymakers should encourage sustainable economic growth; attract high-value foreign direct investment; promote trade; lower remittance-transfer costs; broaden the availability of digital financial services for all; and enhance government effectiveness. Finally, it may be possible to boost the development impact of remittances on the national economy using policies that direct diaspora funding into enterprise creation or infrastructure.

**Keywords:** Remittances; Foreign Direct Investment; Economic Growth; A Time Series Analysis

**JEL Classification Codes:** F24, F21, O47, C22

### Introduction

For decades, Pakistan has been plagued by domestic savings shortfalls, a narrow export base, recurrent balance of payments pressures, and limited productive investment to sustain durable economic growth. In this environment, international economic integration can affect output, employment, productivity, and external-sector stability through important transmission channels: remittances, foreign direct investment (FDI), and trade openness. Understanding their interactions is important because Pakistan relies on the income of overseas workers, foreign direct investment (FDI) to fill a gap in domestic savings, and trade for inputs, technology and larger markets. Such flows also interact with exchange-rate movements, financial markets, industrial development and the government's structural economic transformation agenda.

Indeed, remittances are one of the key sources of foreign exchange for Pakistan. They are typically driven by family responsibilities, in contrast to many private capital flows, and may be more resistant to local economic damage. At the household level remittances can ease liquidity constraints, stimulate consumption, boost education and health spending as well as help cover housing or small business costs. They are also macroeconomic stabilizers, since they strengthen the reserves of foreign exchange and facilitate the payment of imports. Nevertheless, they do not automatically exert a positive growth effect. In the event that remitted income is primarily fungible to consumption, imported merchandise or unproductive assets, the input of labor returns their effect on generating gainful

limit might be confined. Big capital inflows might also raise the real exchange rate and make exports less competitive. Thus, the impact of remittances is conditioned by financial development, investment opportunities and the policy environment (Giuliano & Ruiz-Arranz, 2009; World Bank, 2022).

A fourth possible supply of long-term finance is FDI. Besides increasing the capital stock, foreign investment can also bring new technologies, management practices, production networks and links with global markets. These advantages can increase labor productivity and produce spillovers for domestic firms . However, its input comes from human capital, institutional quality, infrastructure, political stability and linkages between foreign and indigenous firms. Following the premise that FDI generates stronger growth benefits when host economies have a stock of absorptive capacity. Borensztein et.al. (1998) have related this to institutions found at country level. Pakistan may never meet its true developmental potential through foreign investment due to inconsistent policies, energy constraints, security concerns and regulatory uncertainty.

Almost all empirical studies demonstrate that trade openness is an important stimulus for growth through promoting specialization, competition, economies of scale and better diffusion of knowledge and technology. Openness by enabling access to imported machinery and intermediate inputs is likely to enhance domestic productivity, while export expansion can create jobs and earn foreign exchange. The academic literature shows that openness does not always lead to growth. It provides benefits only through export diversification, infrastructure, institutional capability and competitiveness of domestic producers. If this rise in imports is not matched by an increase in exports, the trade deficit will expand and external financing pressures will further aggravate. While Frankel and Romer (1999) also find a positive effect of trade on income, they argue that country specific structural factors dominate in importance.

Closer examination of the interplay among these foreign flows is warranted. While permits remittances entrepreneurship and reinforce the ability of households to trade, FDI helps boost export and transfer technology. On the other hand, weak institutions and insufficient productive capacity could result in remittances being spent primarily on consumption, FDI becoming concentrated in protected sectors, and trade openness causing imports to grow faster than exports. Most of the existing studies have focused on these factors individually so far, and might have missed these interactions in affecting the growth process in Pakistan.

Thus, this study examines the long-run relationships of remittances, FDI, trade openness and economic growth in Pakistan by using a time-series framework. In one model, this approach allows us to then study whether these external-sector variables are complements to each other and their effects across different time horizons. The results will be used to support policies directing remittances into productive investment, attracting FDI with efficiency enhancing characteristics, and strengthening export capacity in order to help Pakistan fully connect with the global economy.

### Literature Review

The neoclassical and endogenous growth theories which inform the relationship between remittances, foreign direct investment<sup>1</sup> (FDI), economic growth. In Solow (1956) examined that capital accumulation and technological progress as the main drivers of long-run growth, while Romer (1986) emphasized knowledge, innovation and increasing returns. Remittances and FDI can complement domestic savings, provide the capital for investment and increase productivity in these frameworks. But their growth effects depend upon the mode of use of external resources and the capacity endowment of borrowers with respect to financial, institutional and human capital.

Remittances stimulate economic growth via consumption, savings and investment, education and healthcare, entrepreneurship, and poverty reduction. In economies limited by capital, they could empower households to make acquisitions they would otherwise not be able to. Giuliano and Ruiz-Arranz (2009) suggested that remittances foster growth especially in regions with shallow financial sectors due to the fact indeed they constitute an alternative source of funding. Similarly, Catrinescu et al. (2009) emphasized that sound institutions and policies are what decides the long-term economic impacts of remittances. Nyamongo et al. (2012) analyzed that remittances benefitted economic growth in African economies, but the impacts were different as a result of varying levels of financial development

Some other studies challenge the positive relationship between remittance and growth. Remittances are not profit-seeking capital flows rather they are compensatory household transfers (Chami, Fullenkamp and Jahjah, 2005). This, in turn, can discourage recipients from working more (in other words reduce their labor supply) and cause moral-hazard problems. Barajas et al. (2009) evidenced from the work of who corrected common measurement and endogeneity problems in their analysis and found that remittances exert only a limited effect on long-run

economic growth. These heterogeneous results suggest the possibility that remittances might enhance household welfare while not indeed changing production at the national level. As a result, when looking at their macroeconomic impact, their effect depends on whether these funds finance investments that will generate output or simply serve to underpin consumption and non-productive assets.

Likely, evidence from the FDI-growth literature also presents a mixed picture. In a study conducted by Borensztein, De Gregorio, and Lee (1998), it was found that FDI serves to spur growth through technology transfer but moreover depends heavily on the human capital in place of the host nation for its overall advantages. An interesting analysis of the economy and financial development is made by Georgios (2004), who illustrated that developed capital markets allow economies to benefit much bigger from foreign investment development is very important issue. In contrast, various other studies (e.g., Carkovic and Levine (2005)) failed to examined any consistent independent link after controlling for endogeneity (the correlation between the growth rate of an economy and its stock of human capital) and country-specific effects. Together, these studies suggested that FDI by itself is not a panacea for growth, since the contribution of FDI varies according to absorptive capacity, domestic investment rates and institutional quality as well as linkages between foreign and local firms.

Pakistan specific evidence remains equally diverse. According to Iqbal and Sattar (2005), workers remittances had a positive impact on economic growth in Pakistan as they fueled consumption and investment. Khan (2007) found that FDI had a positive impact on growth once the level of development of Pakistan domestic financial sector improved sufficiently. Ahmad et al. Using data for 1978 to 2011, Sahoo et al. (2013) found a positive relationship between remittance and FDI and GDP, Saqib, Masnoon and Rafique (2013) therefore found that FDI had a negative impact on the economy of Pakistan while domestic investment was positive. These differences could be due to dissimilar sample periods, variables, specifications and estimation methods.

Tahir, Khan, & Shah (2015) did a joint analysis of remittances, FDI, Imports and growth in Pakistan. The authors conclude from their time series evidence that remittances and FDI promoted growth, while imports exerted a negative impact. Using data from 1966 to 2014, Javaid (2016) employed an ARDL error correction model and discovered short- run and long-run positive effects of FDI that were highly significant. Khan et al. Bedoya (2019) applied ARDL analysis for the period

1976–2016 and showed that in the long run remittances, FDI, and domestic savings had positive roles while inflation and consumption exerted negative effect on growth. Nazir et al. (2020) also confirmed that remittances and trade openness were a part of the long-run growth relationship for Pakistan. Ali et al. (2021) FDI and official development assistance was found to have a positive effect on growth, while the effect of remittances is specification sensitive. Ahmad and Khan (2022) employed the ARDL analysis, established statistically significant long-run relationships between remittances, FDI and growth.

In summary, findings across studies show some heterogeneity. Accelerating investment, foreign exchange enhancements, technology transfer and financial inclusion are the positives. While dependency, declining labor participation, dividend repatriation and weak domestic linkages issues feature on the other side of the ledger. A large number of Pakistan studies look at either remittances and FDI, a different measure of growth, or are based on time periods which have passed. Thus, estimating their short-run and long-run effects together using a more recently updated time series model can yield clearer evidence on whether these foreign inflows act as compliments to each other in Pakistan's growth process.

### Data and Methodology

The present study takes time series data from 2000 to 2021 from World Development Indicators (WDI) for Pakistan. We summarize the definitions and units of measurement of these variables in Table 1. Remittances (REM) is the personal receipt of remittances as % of GDP and GDP per capita growth reflects measuring income performance. Government stability (GS) and political stability (PS) are measured on scales of 0 to 100, with higher scores indicating stronger governance and stability. Foreign direct investment (FDI) is FDI net inflows as a share of GDP. Annual growth of gross fixed capital formation (GFC) and Trade Openness (TOP), this is the sum export and import in GDP.

$$REM = f(GDP, FDI, TOP, GFC, GS, PS) \quad (1)$$

$$REM = \alpha_0 + \alpha_1 GDP + \alpha_2 FDI + \alpha_3 TOP + \alpha_4 GFC + \alpha_5 GS + \alpha_6 PS + \varepsilon_t \quad (2)$$

**Table 1:** *Source and Data Description.*

| Variables | Unit of Measurement                       | Source |
|-----------|-------------------------------------------|--------|
| REM       | Personal remittances received as % of GDP | WDI    |
| GDP       | Annual % growth                           | WDI    |
| GS        | Scaled from 0 to 100                      | WDI    |
| PS        | Scaled from 0 to 100                      | WDI    |

|     |                         |     |
|-----|-------------------------|-----|
| FDI | Net inflows as % of GDP | WDI |
| GFC | Annual % growth         | WDI |
| TOP | % of trade share in GDP | WDI |

Notes: REM= Remittances, GDP=GDP per capita, FDI=Foreign direct investment flow, TOP= Trade openness, GFC=Gross fixed capital formation, GS= Government Stability, PS=Political Stability.

### Advantages of OLS

When all variables are I(1) running Ordinary Least Square (OLS) can be useful because the variables will be non-stationary in levels but stationary. For cointegrated variables, OLS yields consistent estimates of the long-run relationship. The estimated coefficients, therefore, are usually consistent. They converge to their true values faster than whenever a regression includes stationary variables. The OLS is easy to implement and interpret, and one can apply a unit root test on the residuals that results from OLS in order to assess the potential of cointegration. These residuals can then be used as an error-correction model, comprising both a short-run correction mechanism and long-run equilibrium. Nonetheless, these benefits hold only under cointegration of the I(1) variables. Without cointegration OLS may generate a spurious regression with a high R-squared and seemingly significant coefficients despite the lack of any real relationship.

The correlations among the study variables are shown in Table 2. However, remittances (REM) are positively correlated with all GDP per capita (0.32), FDI (0.45), trade openness (0.52), government stability (0.88) and political instability (0.55). Whereas gross fixed capital formation negatively correlates with remittances - 36%. The most positive relationship is found for REM and government stability, indicating that stable governments help attract these remittance flows. Economic variables are strongly positively correlated with GDP per capita: FDI (0.84), government stability (0.75) and political stability (0.78), while they are negatively associated with trade openness (- 0.35) and capital formation (- 0.58). The highest negative correlation (-0.89) is between trade openness and gross fixed capital formation. Capital formation is positively correlated with government stability (0.77), but negatively associated with FDI (-0.70) and trade openness (-0.56). Overall, some correlations are larger than 0.80 (in absolute value) with the strongest being REM-GS, GDP-FDI and TOP-GFC which point out multicollinearity that should be checked prior to regression estimation.

**Table 2:** *Correlation between variables*

|     | REM   | GDP   | FDI   | TOP   | GFC  | GS   | PS |
|-----|-------|-------|-------|-------|------|------|----|
| REM | 1     |       |       |       |      |      |    |
| GDP | 0.32  | 1     |       |       |      |      |    |
| FDI | 0.45  | 0.84  | 1     |       |      |      |    |
| TOP | 0.52  | -0.35 | 0.75  | 1     |      |      |    |
| GFC | -0.36 | -0.58 | -0.39 | -0.89 | 1    |      |    |
| GS  | 0.88  | 0.75  | -0.70 | -0.56 | 0.77 | 1    |    |
| PS  | 0.55  | 0.78  | 0.43  | 0.45  | 0.34 | 0.19 | 1  |

Notes: REM= Remittances, GDP=GDP per capita, FDI=Foreign direct investment flow, TOP= Trade openness, GFC=Gross fixed capital formation, GS= Government Stability, PS=Political Stability.

In Table 3, Augmented Dickey-Fuller (ADF) test results are used to conduct unit root test for the stationarity of the variables. The ADF also has a null and alternative hypothesis, where the null states that a variable has a unit root and is non stationary. The ADF calculated statistics after taking first differences are more negative than the 5% critical values for all variables. As indicated by the statistics on table 3, for instance, REM has an ADF statistic of -4.36 against a critical value of -2.16, and GDP has a statistic of -3.12 against -2.59. The results with respect to FDI, TOP, GFC, GS and PS are similar. So, the unit-root null hypothesis is rejected at 5% significant level after taking the difference of first order. The findings show that all of the variables are stationary at first differencing and as such, they are integrated of order one, I(1). Since this integration order is widespread, it allows for cointegration techniques to investigate the potential long-run relationships between the variables.

**Table 3:** *The Findings of ADF Test*

| Variables | Parameters | ADF<br>Calculated | At<br>5% | Trend/<br>Intercept | Conclusions |
|-----------|------------|-------------------|----------|---------------------|-------------|
| REM       | -0.31      | -4.36             | -2.16    | Trend               | I(1)        |
| GDP       | -0.65      | -3.12             | -2.59    | Trend               | I(1)        |
| FDI       | -0.21      | -5.49             | -3.69    | Intercept           | I(1)        |
| TOP       | -0.39      | -4.34             | -2.19    | Trend               | I(1)        |
| GFC       | -0.53      | -3.69             | -3.16    | Trend               | I(1)        |
| GS        | -0.24      | -4.19             | -2.48    | Intercept           | I(1)        |
| PS        | -0.14      | -5.89             | -3.89    | Trend               | I(1)        |

Note: The Results of the Table 3 are based on author's self-calculations

In Table 4, the OLS estimates of economic and institutional determinants affecting remittance inflows. We used Remittances as dependent variable whilst GDP per capita, foreign direct investment, trade openness, gross fixed capital formation government stability and political stability are the explanatory variables. All the explanatory variables are positively signed meaning remarkable progress in economic growth, international integration, investment and institutions is broadly related to higher volume of remittance. The coefficient for GDP per capita is 0.56 with t-ratio of 2.43. Because its t-ratio exceeds about 1.96, the coefficient is statistically different from zero at the standard 5% level. The higher GDP per capita is expected to increase remittance inflows. An expanding economy can offer stronger financial services, a more dependable transfer mechanism, ameliorated investment options, and improved political orientation. While remittances are expected to rise in poor-receiving economy countries because migrants provide family support in hard times, the positive coefficient suggest investment motives as well. This allows for more migrant remittances through greater fruitful opportunities of the type offered by housing, businesses, education, and financial assets as economic growth occurs.

Foreign direct investment is also indicating a more inviting investment climate (more specifically, better institutions and infrastructure that improve investor return), and greater confidence in the domestic economy. These conditions could incentivize migrants to remit using formal financial systems and make productive investments. FDI can also open up job opportunities, promote technology transfer and develop the financial sector thereby facilitating remittance transfers by reducing associated costs. Consequently, FDI and remittances might appear to be complementary foreign capital rather than substitutes. Both can help to alleviate foreign exchange availability and promote economic development.

The coefficient for trade openness is 0.49, which has a t-ratio of 3.76. But it is based on t-ratio number, the most statistically significant explanatory variable in the model. The results show that integration with international markets is positively correlated with higher remittance inflows. Greater trade openness could enhance economic and financial ties between the home country and foreign countries. It could enhance banking services, lower the costs of cross-border transactions, encourage competition among money-transfer providers, and create better access to formal remittance channels. In an open economy, remittance-receiving households may also set up business in the areas where imports are

located and imported goods are used with international trade. These opportunities might incentivize migrants to remit more funds for investments.

The coefficient corresponding to gross fixed capital formation is 0.64, which indicates that an increase in the gross investment on infrastructure, machinery, buildings or other productive assets may guarantee remittances commensurate to 0.64 units of accountability per year. The migrants may provide capital development opportunities to invest their savings back home. The t-ratio of 1.30 is not statistically significant at the conventional 5% level.

The association with remittance inflows is strongly positive and statistically significant for government stability, which has a coefficient of 0.78 and t-ratio 2.23. Stable governments by reducing economic and policy uncertainty, improving the protection of property, and strengthening confidence in domestic institutions, result in a positive impact on growth. The migrants are more inclined to remit for investment and saving. Government stability might also aid banking regulation and decrease the price and risk of formal transfers. Institutional confidence has a comparatively large positive coefficient, indicating its economic importance for stimulating remittances.

The coefficient for political stability is 0.19, with a t-ratio equal to 1.46, indicating that political stability is not statistically significant at the 5% level. Political risk makes remittances less attractive, while political stability may reduce such risks and increase confidence for investing. However, remittances can also act in a countercyclical manner. When political turmoil threatens the livelihood of families at home, migrants may send more to help them meet basic needs. The seemingly counteracting effects of these motivations can attenuate the predicted relationship. In addition, political stability may intersect with government stability and thus it is often difficult to ascertain the separate effect.

The model's R-square is 0.89 which suggests that these explanatory variables as a total explain about 89% of the variation in remittances observed. The adjusted R-square is well above 0.82 even after controlling for the number of explanatory variables, which suggests strong overall explained power. With a Durbin-Watson statistic of 2.06, our model indexes close to two, which indicates that there is no clear first-order serial correlation in the residuals. In general, GDP, FDI, openness of trade and government stability are major positive determinates of remittances while gross fixed capital formation and political stability are positively but statistically not significant.

Table 4: *Parameter Estimates Using OLS: Decedent variable is Remittances*

| Explanatory Variables   | Coefficients | Standard Error<br>Coefficients | T-Ratio |
|-------------------------|--------------|--------------------------------|---------|
| GDP                     | 0.56         | 0.23                           | 2.43    |
| FDI                     | 0.74         | 0.29                           | 2.55    |
| TOP                     | 0.49         | 0.13                           | 3.76    |
| GFC                     | 0.64         | 0.49                           | 1.30    |
| GS                      | 0.78         | 0.35                           | 2.23    |
| PS                      | 0.19         | 0.13                           | 1.46    |
| Constant                | 8.49         | 2.36                           | 43.59   |
| R-Squared               | 0.89         |                                |         |
| Adjusted R Squared      | 0.82         |                                |         |
| Durbin Wastan Statistic | 2.06         |                                |         |

Note: Results are based on Author's own calculations by using the Microfit

### Conclusion and Policy Implication

Economic performance, international capital flows, trade integration and the quality of institutions are important drivers of remittance inflows based on OLS findings. It shows that GDP per capita has a positive and statistically significant correlation with remittances, which means that improved economic conditions increase the financial systems and investment opportunities as shown to be more likely for migrants to send higher amounts of money back to their home country. Furthermore, foreign direct investment positively impacts remittances, suggesting that an appealing climate for investment stimulates migrant confidence and encourages the transfer of funds. Among them, trade openness stands out as one of the most influential. Increased integration into international trade may increase financial access, decrease transfer costs and provide income-expanding options for remittance receiving households. Government stability also has a strong positive impact, indicating that predictable policies, working institutions and safe economic environment promotes receipts of remittances. Gross fixed capital formation and political stability have, meanwhile, positive but statistically insignificant effects. While they may support remittance inflows, the evidence does not display independent impacts.

Policymakers should address sustainable economic growth by enhancing productivity and employment generation, infrastructure development, educational attainment and financial inclusion. A better-performing local economy would enable migrants to invest remittances rather than only spend them. Investors

should be secure under well-established, transparent and outcome-non-discriminatory regulations with reliable institutions and bureaucratic procedures to minimize red tape, while property rights need to be secured. Trade policies need to remove ineffective barriers, enhance the streamlining of customs administration, and reinforce inclusion in global markets. In governments lowering remittance transfer costs by fostering competition among banks, mobile payment providers and money-transfer operators. It also highlights the need for secure and affordable formal transfer channels, whilst being accessible, especially in rural areas. Lastly, increasing migrant confidence could be achieved by enhancing government effectiveness, policy stability, political accountability and institutional trust. Diaspora bonds, migrant savings accounts, and investment-support programs may be able to channel remittances into businesses, housing, infrastructure, and other means of productive activity.

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