

REMITTANCES VERSUS FOREIGN DIRECT INVESTMENT: A COMPARATIVE ANALYSIS OF THE IMPACT ON ECONOMIC GROWTH IN REMITTANCE-DEPENDENT COUNTRIES (2005–2024)

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Abstract: This article analyzes the comparative impact of remittances and foreign direct investment (FDI) on economic growth in economies highly dependent on external financial inflows. Although both FDI and remittances contribute to development, they operate through distinct mechanisms: remittances primarily enhance household consumption and welfare, while foreign direct investment stimulates productive capacity, innovation, and structural transformation. The study aims to determine whether these financial flows act as substitutes or complements in promoting sustainable growth and how their effects differ across developing economies. The research focuses on the evolution of ten countries with a high remittance to GDP ratio over the period 2005–2024, using World Bank data: Tajikistan, Lebanon, Samoa, Nepal, Gambia, Nicaragua, Honduras, Lesotho, El Salvador, and Haiti. These countries were selected based on the most recent World Bank data on the share of remittances in gross domestic product for the year 2024. To identify the determinants of GDP growth, econometric estimations were performed using three distinct models: Pooled Ordinary Least Squares, Fixed Effects and Random Effects. The dependent variable was GDP growth rate, while the explanatory variables included remittances, foreign direct investment, exports, final consumption expenditure and gross capital formation, each expressed as a proportion of GDP, along with the logarithm of the exchange rate. Interpolation was used to address missing data and the exchange rate variable was log transformed to facilitate coefficient interpretation. Diagnostic tests, including the Breusch–Pagan and Hausman tests, identified the random effects model as the most appropriate specification, combining consistency and efficiency. The results indicate that foreign direct investment, final consumption expenditure, and gross capital formation have significant positive effects on economic growth, while remittances exert a positive but less stable influence. These findings suggest that remittances support short term stability, whereas foreign direct investment promotes long term productivity and transformation. The study concludes that both financial flows are complementary and, when supported by coherent policies, can reinforce each other to foster inclusive and sustainable growth in remittance dependent economies.

Keywords: Economic growth; foreign direct investment; panel data analysis; remittances; structural transformation; sustainable development

JEL Classification: F21, F24, O47, C33

INTRODUCTION

External financial flows, which are intended to supplement domestic resources, have long had a major influence on the economic growth of developing economies. Two of the most important components that contribute to shaping economic growth are remittances and foreign direct investment (Castles, de Haas & Miller, 2014). Remittances are an important source of income for households and, in many cases, for the national economy itself, representing money transfers from migrants to their countries of origin. At the same time, foreign direct investment is an infusion of capital that brings with it productive investment, technology transfer and, last but not least, the creation of new jobs (Prelipcean & Ivan, 2023).

We can say that although they operate through fundamentally different channels, both mechanisms contribute to the development process.

A noteworthy aspect is that the intensification of the interconnection of these financial flows is itself the globalisation of the labour market. External resources have proven to be a fundamental factor for economic stability and the maintenance of a certain level of social welfare, a situation most often encountered in developing economies that are dependent on remittances. It should be noted that, although remittances stabilise consumption and reduce the level of poverty among the population, they cannot be assimilated as long-term foreign investment (International Organization for Migration, 2019). From this perspective, foreign direct investment generates sustained economic growth, but is more volatile, being influenced by external conditions, including global demand, the host country's level of global confidence and, last but not least, internal governance.

The way in which the two financial flows interact and their contribution to economic growth is a decisive factor for both politicians and researchers (Ivan, Prelipcean & Lupan, 2024). We can say that, depending on the situation, the two financial flows are mutually substitutable, with one filling the deficit of the other, but in other cases they act in a complementary manner, with remittances improving the financial inclusion and human capital necessary to attract and absorb foreign direct investment. These aspects are relevant in countries where remittances account for a significant share of gross domestic product, as they influence both the pace and stability of economic growth. (Chami, Jahjah & Fullenkamp, 2003)

The last two decades have been marked by remarkable fluctuations in global economic conditions, from the 2008 financial crisis to the 2020 pandemic shock. This has revealed a number of vulnerabilities in small economies and highlighted the importance of external financial resilience. In the case of remittance-dependent economies, such economic shocks have severely tested the ability of these flows to cushion recessions and sustain household consumption. At the same time, multiple questions have been raised about how to balance short-term stabilisation with long-term structural development based on external capital flows. (Cox & Ureta, 2003)

Through a comparative econometric analysis of ten economies characterised by high remittance dependence, *Tajikistan, Lebanon, Samoa, Nepal, Gambia, Nicaragua, Honduras, Lesotho, El Salvador and Haiti*, over the period 2005-2024 and using panel data techniques, Pooling OLS, Fixed Effects and Random Effects, a study was developed that explores the contributions of remittances and foreign direct investment to economic growth. The objective is to identify which of these flows have a stronger and more consistent impact on GDP growth and whether their combined presence increases resilience or amplifies volatility. Beyond the quantitative results, the analysis also seeks to clarify the implications for development of dependence on remittance-driven consumption or investment-driven expansion.

The study is mainly motivated by the need to establish a knowledge and evidence base for policy-making in emerging and developing economies. In a context marked by financial constraints and structural heterogeneity, understanding the different roles of remittances and foreign investment becomes crucial for formulating sustainable growth strategies. By comparing their effects over time, this research aims to provide a nuanced understanding of how external financial flows can be used to promote inclusive, stable and sustainable economic development.

LITERATURE REVIEW

Remittances are widely recognised as cross-border financial transfers sent by individuals, most often migrant workers, to their families or other individuals in their countries of origin. These transactions take place through formal mechanisms, such as banks and money transfer operators, as well as through informal channels, which remain predominant in many developing economies (World Bank, 2021). In contemporary economic literature, remittances are increasingly conceptualised not only as private financial flows, but also as a macroeconomic force capable of influencing growth, stability and economic development outcomes (World Bank, 2021). Their magnitude and cyclical behaviour are determined by migrants' incomes, exchange rate fluctuations and the political environment in both the countries of origin and destination.

A central distinction in academic debates concerns the dual impact of remittances at both the macroeconomic and microeconomic levels. At the macroeconomic level, remittance flows strengthen balance of payments positions, support foreign exchange reserves and mitigate the impact of external shocks (World Bank, 2021). At the microeconomic level, they influence household welfare through their effects on consumption, savings, and investment in human capital and businesses (World Bank, 2021). This dual structure underlies the recurring question of whether remittances act as a substitute or a complement to domestic investment and development financing.

A substantial body of empirical evidence links remittances to poverty reduction in recipient economies. The regularity of these transfers allows households to maintain stable consumption, mitigate income shocks and accumulate assets, which can reduce vulnerability and the incidence of poverty (World Bank, 2021). In addition, remittances often finance spending on education, health, and housing, thereby promoting long-term improvements in the well-being of the population benefiting from these external flows, beyond short-term consumption (World Bank, 2021).

Another key channel of influence is the impact of remittances on aggregate demand. By increasing disposable income, remittances expand household consumption, which in turn stimulates demand for locally produced goods and services (World Bank, 2021). This demand effect can generate multiplier effects in local economies, stimulating revenues in sectors such as retail, construction, and personal services (World Bank, 2021). The cumulative result is often an improvement in local employment and productive capacity.

Beyond consumption, remittances often serve as a source of investment capital. Households often use these funds to start or expand small businesses, thereby contributing to local entrepreneurship, job creation, and economic linkages between rural and urban areas (World Bank, 2021). These investments are also directed towards education and skills development, which improves human capital and long-term productivity (World Bank, 2021). Thus, remittances play a multidimensional role in supporting both immediate well-being and future growth.

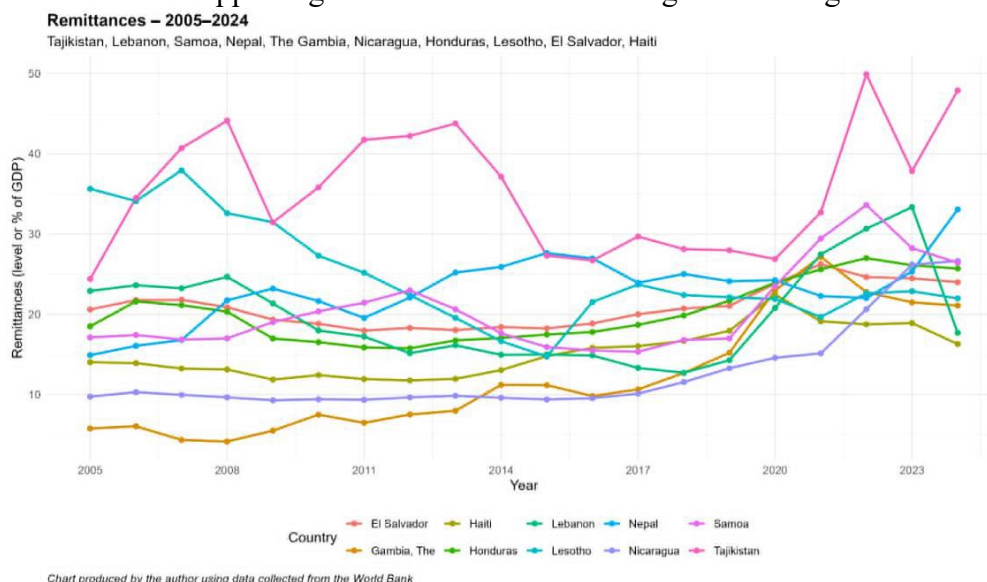


Figure 1 Remittances (% of GDP), 2005–2024

Source: Author's graph based on data from the World Bank.

The longitudinal trend in remittance flows to selected developing economies reveals remarkable persistence and resilience, even in the context of global economic disruptions. Countries such as Samoa and Nepal consistently record a high ratio of remittances to GDP, often exceeding 30%, underscoring their structural dependence on migrant transfers as a source of external revenue (World Bank, 2021). In contrast, economies such as Gambia, Honduras and El Salvador maintain moderate but stable flows, while Haiti and Lesotho experience moderate volatility, reflecting their

internal vulnerabilities. The upward trajectory in most countries after 2019 also coincides with the post-pandemic recovery period, highlighting the countercyclical nature of remittances, which tend to remain stable or even increase when domestic economic conditions worsen (World Bank, 2021).

Visual evidence supports the extensive literature describing remittances as a macroeconomic stabiliser and a buffer of private welfare (World Bank, 2021; Forte & Moura, 2013). Relatively smooth and persistent trends, compared to more volatile financial flows such as FDI, indicate that remittances provide a reliable income stream that supports household consumption and contributes to macroeconomic resilience. Moreover, in economies with limited access to international capital markets, remittances function as an informal but substantial source of external financing, covering the gap between savings and investment. The chart in **Figure 1** thus supports the view that remittance flows, although driven by microeconomic factors, generate macroeconomic stability and support domestic demand in economies characterised by structural constraints.

However, the potential impact of remittances on development is limited by the high cost of transfers. The World Bank (2021) estimates that fees for international remittances average around 6%, reducing the amount available to households. High costs limit the ability of remittances to support development and encourage the use of informal channels, which can reduce transparency and reliability (World Bank, 2021). Reducing transaction costs remains a key policy priority for improving the effectiveness of remittances.

Dependence on remittances is another cause for concern. For some economies, remittance flows constitute a substantial share of GDP, creating vulnerabilities to external labour market conditions, migration trends and global economic fluctuations (World Bank, 2021). Excessive dependence can reduce incentives for domestic investment and complicate fiscal management, hindering long-term structural transformation if not balanced by complementary policies (World Bank, 2021).

Security and regulatory dimensions also feature prominently in remittance policy discussions. The risk of money laundering and illicit financial activities requires strict oversight by regulators, but such measures can increase administrative burdens and transaction costs (World Bank, 2021). Striking an optimal balance between financial security and efficient access to remittance services is therefore a major policy challenge for both sending and receiving countries.

Alongside the role of remittances, foreign direct investment (FDI) is widely regarded as a cornerstone of development, providing capital flows that promote GDP growth, job creation, infrastructure development and technological progress (Forte & Moura, 2013; Das & Sethi, 2019; Kadiatou, 2017). Beyond providing capital, FDI promotes knowledge transfer, access to international markets and managerial efficiency, which together enhance productivity and structural transformation (Forte & Moura, 2013; Das & Sethi, 2019).

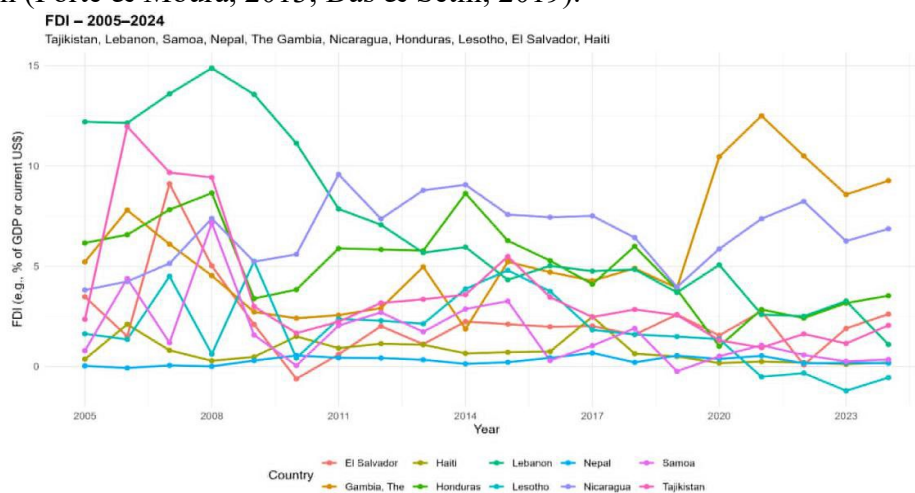


Figure 2. Foreign Direct Investment (% of GDP), 2005–2024

Source: Author's graph based on data from the World Bank.

In **Figure 2**, the temporal evolution of FDI flows reveals significant fluctuations between countries, reflecting both global and domestic economic dynamics. In the mid-2000s, most countries experienced moderate FDI flows, with peaks observed between 2008 and 2010, a period corresponding to the global investment boom before the global crisis (World Bank, 2021). The subsequent decline after the 2008 financial crisis and intermittent volatility in the 2010s are consistent with the general slowdown in international capital mobility. Countries such as Lebanon and Gambia show relatively high variability, suggesting sensitivity to political or institutional instability, while other countries, such as Lesotho and Nepal, show more gradual variations. Data recorded after 2020 reveal a heterogeneous recovery, with some countries experiencing investment inflows while others continue to record modest investment performance, likely reflecting different speeds of recovery and policy effectiveness in the wake of the COVID-19 shock.

This pattern highlights the cyclical and confidence-sensitive nature of FDI worldwide compared to remittances. The heterogeneity across countries visible in the chart underscores the importance of trade policies, governance quality, and the ability to attract and retain foreign investment (Tsaurai, 2023; Nantharath & Kang, 2019). The volatile trajectories suggest that, although FDI can be a catalyst for growth, its benefits depend on structural stability and institutional quality. Countries with an improved regulatory environment and stronger infrastructure, illustrated by moderate but steady flows, demonstrate the ability to transform foreign capital into productive outcomes. In contrast, countries characterised by irregular investment patterns are more likely to experience capital withdrawals driven by political risks or financial system fragilities.

Overall, the chart highlights the theoretical argument that the contribution of FDI to development depends less on the volume of investment flows and more on their consistency and context. The visible divergence between relatively stable and volatile trends reflects the dual nature of FDI: both as an engine of growth and as a potential channel of vulnerability. These findings reinforce the importance of maintaining macroeconomic stability and policy credibility to support long-term investment commitment (Choe, 2003; Zain, 2019).

An illustrative example of the effectiveness of FDI can be seen in Singapore, where strong institutional quality, political stability and world-class infrastructure have made the country a global centre for investment (Lazari, 2024). Singapore's experience demonstrates how sound governance and coherent policy frameworks can transform FDI flows into sustained growth and innovation (Lazari, 2024). This case highlights the central role of trade policies in mediating FDI outcomes.

Empirical research confirms that FDI flows are associated with economic growth in many emerging economies. In Romania, for example, policy reforms and improvements in the business environment have positioned FDI as a major contributor to national economic development (Țoc, 2021; Obradović et al., 2021). However, the extent of the benefits generated by FDI varies from country to country and from sector to sector, indicating that positive outcomes depend on the domestic absorption capacity and structural characteristics of the host country's economy. (Țoc, 2021; Obradović et al., 2021).

A key determinant of the impact of FDI on development is the absorption capacity of the recipient country, particularly the quality of human capital and macroeconomic stability. Studies suggest that without a skilled workforce and strong institutional capacity, potential spillover effects, such as technology transfer or productivity growth, remain unrealised (Tsaurai, 2023; Nantharath & Kang, 2019). Therefore, effective FDI requires parallel investments in education, governance, and institutional integrity (Tsaurai, 2023; Nantharath & Kang, 2019).

Education and skills development are particularly important for maximising the benefits of FDI. Investments in human capital enhance a nation's ability to absorb, adapt and utilise the advanced technologies and management techniques introduced by foreign investors (Khachatryan, 2023). This process strengthens productivity growth and facilitates deeper integration into global value chains (Khachatryan, 2023).

Social and political conditions also play a significant role in attracting FDI. Factors such as religious freedom, transparency and political stability have been shown to encourage higher levels of foreign investment (Abbas, 2022; Akkaya, 2019). A stable and transparent institutional framework thus enhances investor confidence and promotes long-term economic stability (He, 2018).

In terms of trade policy, the development benefits of foreign direct investment are maximised when host countries strengthen their domestic capacities while maintaining investor friendly regulations. Secure private property rights, credible governance and coherent legal frameworks consistently emerge as prerequisites for the sustainable success of foreign direct investment (Choe, 2003; Zain, 2019). These interconnections underscore that the effectiveness of foreign direct investment depends on a broader ecosystem of policy coordination and institutional strength.

Studies comparing remittances and FDI often focus on whether the two act as substitutes or complementary flows. Remittances primarily support household welfare and consumption, while FDI contributes to productive capacity and technology transfer. Evidence increasingly suggests that the two flows can be complementary, with remittances improving human capital and financial inclusion conditions that, in turn, facilitate the productive absorption of FDI (World Bank, 2021; Forte & Moura, 2013).

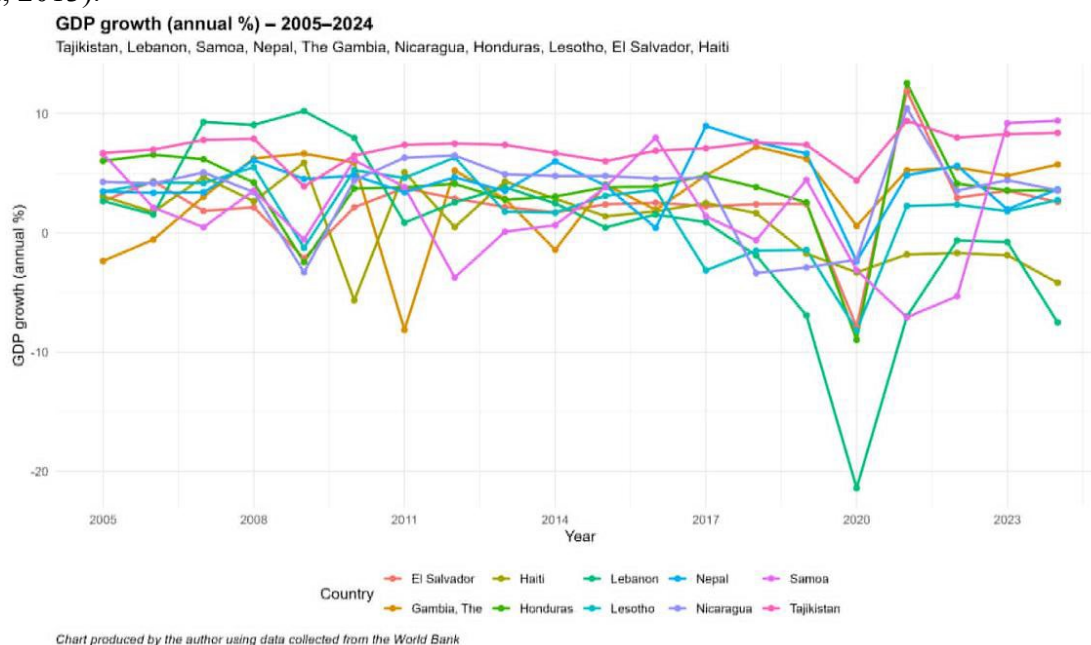


Figure 3. GDP Growth (annual %), 2005–2024

Source: Author's graph based on data from the World Bank.

The GDP growth trajectory of the countries in **Figure 3** shows considerable cyclicality, with noticeable declines in 2008, 2009 and 2020, corresponding to the global financial crisis and the COVID-19 pandemic. Despite these shocks, most countries recovered quickly, reflecting the resilience of domestic demand and, in most cases, the stabilising influence of remittance flows. The sharp contractions in 2020, followed by robust recoveries, suggest that external financial flows, both remittances and FDI, play a countercyclical role in mitigating growth fluctuations (World Bank, 2021). In particular, the economies of countries such as Samoa, Nepal and Nicaragua show relatively moderate volatility, possibly due to sustained remittance flows, while countries with more volatile FDI patterns, such as Lebanon and Gambia, show more pronounced fluctuations in growth rates.

The alignment between periods of growth in remittance flows and improved economic performance provides empirical support for the literature that emphasises the role of remittances in economic development by stabilising consumption and maintaining demand (World Bank, 2021). At the same time, the more volatile influence of FDI flows highlights their dependence on external

confidence and internal institutional quality. The graph also illustrates that the dynamics of economic growth are multidimensional: structural reforms, governance and macroeconomic stability mediate the efficiency with which external capital flows translate into real increases in output (Forte & Moura, 2013; Tsaurai, 2023).

Overall, the graphical evidence reinforces the argument that, although both remittances and FDI influence economic growth, they do so through distinct but potentially complementary mechanisms. Remittances support immediate consumption and welfare stability, while FDI stimulates capital formation and technological progress. The comparative stability of remittance trends and the volatility of FDI flows reflect their impact on GDP growth: steady resilience driven by households versus cyclical expansions driven by investment. This interaction validates the theoretical proposition that a balanced combination of both flows enhances the overall sustainability of economic growth in developing economies (World Bank, 2021; Khachatryan, 2023).

In conclusion, remittances and FDI are distinct but interconnected channels of external financing. Remittances reduce poverty and support consumption, while FDI stimulates structural transformation and technological progress. Their combined development potential depends on coherent policy frameworks that reduce remittance costs, improve access to finance, strengthen governance, and invest in human capital. When properly managed, these flows can work synergistically to promote sustainable economic growth (Tsaurai, 2023; Khachatryan, 2023; World Bank, 2021).

METHODOLOGY

This study uses three econometric models: Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects (FE) and Random Effects (RE), which are necessary to analyse the determinants of GDP growth using panel data in the top 10 countries worldwide most dependent on remittances, namely Tajikistan, Lebanon, Samoa, Nepal, Gambia, Nicaragua, Honduras, Lesotho, El Salvador and Haiti, over a 20-year period, namely 2005-2024. Following the estimation of these models, "observed versus predicted" graphs were generated to assess the degree of correspondence between the predicted and actual values of the dependent variable. In each graph, the red line represents the perfect fit line, and the proximity of the scatter points to this reference line serves as a visual indicator of the accuracy of the model.

The working hypotheses were:

- **H1: Remittances have a positive impact on long-term economic growth in economies heavily dependent on remittances.**
- **H2: Foreign direct investment (FDI) has a positive and significant impact on long-term economic growth.**
- **H3: The effect of FDI on growth is more stable and consistent than that of remittances.**
- The results obtained from the Pooled OLS specification reveal a positive relationship between observed and predicted values of GDP growth. However, the relatively high dispersion of points around the reference line suggests that this approach captures only general associations between variables, without taking into account unobserved heterogeneity across units or over time. This limitation stems from the fundamental assumption of homogeneity implicit in the pooled OLS framework, which treats all observations as identical, ignoring entity-specific effects (Baltagi, 2008). Consequently, although the combined model provides an overview of the data structure, it lacks the ability to isolate the influence of time-invariant characteristics or country-specific dynamics, which is essential in panel data analysis.

The fixed effects model provides a more refined representation of the relationship between variables. The corresponding "Observed versus Predicted" graph shows a visibly tighter grouping of

points around the perfect fit line, indicating improved model accuracy. By introducing entity-specific intercepts, the fixed effects specification effectively controls for time-invariant characteristics unique to each country or observation unit (Wooldridge, 2010). This adjustment improves the model's ability to capture within-country variations, reducing omitted variable errors arising from unobserved heterogeneity. As a result, the fixed effects estimator provides more reliable estimates of coefficients for time-varying variables, reinforcing its suitability for macroeconomic applications with panel data.

In contrast, the random effects model integrates both inter-unit and intra-unit variations, assuming that individual effects are not correlated with the explanatory variables (Greene, 2012). The visual pattern of the Observed versus Forecast graph for the random effects model resembles that of the fixed effects specification, although the dispersion of data points around the perfect fit line is slightly higher. This indicates that, although the RE model retains its explanatory power, its efficiency depends on the validity of its basic assumption of unit effect independence. When this assumption holds, the random effects estimator can produce more efficient results than the fixed effects estimator by exploiting variation both between units and within units (Hausman, 1978; Hsiao, 2014).

The choice between fixed and random effects models is formally assessed using the Hausman test (Hausman, 1978), which determines whether the unique errors (individual effects) are correlated with the regressors. A statistically significant Hausman statistic favours the fixed effects specification, confirming that there is a correlation and that the FE model provides consistent estimates. Conversely, if the test does not reject the null hypothesis, the random effects model is considered appropriate due to its efficiency and unbiasedness under the assumptions of orthogonality.

Overall, the comparative graphical and statistical evaluation of the three models demonstrates clear differences in performance. The combined OLS model provides a simplistic, aggregated representation that is useful for preliminary information but limited in terms of explanatory depth. The fixed effects model substantially improves the fit by taking into account unobserved heterogeneity between entities, while the random effects model offers a balanced approach when cross-sectional and temporal variations coexist under valid exogeneity conditions. The higher concentration of observed values around the perfect fit line in the fixed and random effects graphs indicates that these specifications capture the structural and temporal dimensions of the panel data more effectively than the combined alternative.

Overall, the methodological analysis highlights the importance of model specification in panel data econometrics. The shift from combined models to fixed and random effects models reflects an increased ability to account for structural diversity and variations across units. These improvements ensure that the estimated coefficients more accurately represent the underlying economic relationships that drive GDP growth. Consequently, the combined use of graphical diagnostics and formal specification tests improves both the robustness and interpretability of empirical results.

RESULTS AND DISCUSSION

The econometric evaluation of the three panel data specifications, Pooling OLS, Fixed Effects (FE) and Random Effects (RE), was complemented by graphical analyses designed to assess the predictive accuracy of each model. The Observed vs. Forecast graphs presented in *Figures 4-6* visually illustrate the degree of correspondence between the model's forecast GDP growth values and the actual data observed in the ten countries during the period 2005-2024. In each case, the dotted red line represents the perfect fit line, where the forecasted values are exactly equal to the observed results. The concentration and dispersion of data points around this line serve as an intuitive indicator of model performance and explanatory power.

The econometric model applied is expressed as follows:

$$Y_{it} = c + \beta_2(\text{remit}_{it}) + \beta_3(\text{fdi}_{it}) + \beta_4(\text{exp}_{it}) + \beta_5(\text{fce}_{it}) + \beta_6(\text{gcf}_{it}) + \beta_7(\text{exchr}_{it}) + u_{it}$$

where:

- Y_{it} = GDP growth (annual %), the dependent variable,
- $i = 1 \dots 10$ (countries) and $t = 2005 \dots 2024$ (years),
- c = constant term,
- remit_{it} = personal remittances received (% of GDP),
- fdi_{it} = foreign direct investment net inflows (% of GDP),
- exp_{it} = exports of goods and services (annual % growth, interpolated),
- fce_{it} = final consumption expenditure (annual % growth, interpolated),
- gcf_{it} = gross capital formation (annual % growth, interpolated),
- exchr_{it} = exchange rate (national currency per USD, log-transformed),
- u_{it} = error term.

Interpolation was applied to the variables exports, final consumption and gross capital formation due to missing observations in several countries. For the exchange rate, the natural logarithm was used to normalise extreme values (ranging from 1 to 89,500 local currency units per USD).

Table 1 presents a statistical description of the main variables used in the analysis, including the number of observations, mean, standard deviation, minimum and maximum values. This information provides an overview of the distribution of the data and their variation within the sample.

Table 1: Descriptive statics of variables

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Variable	Observations	Mean	SD	Minimum	Maximum
gdpgrowth	20	2.90	4.31	-21.40	12.57%
remittances	200	20.50	8.32	4.15	49.90
fdi	200	3.51	3.30	-1.21	14.88
exp	200	3.69	21.22	-56.94%	154.34
fce	200	2.96	4.45	-21.84	16.52
gcf	200	4.19	19.26	-95.58%	80.91
log(exchr)	200	3.14	2.06	0.00	11.4

Source: author's calculation

Source: author's calculation

Three panel data models were estimated: Pooling OLS (OLS), fixed effects (FE) and random effects (RE). The analysis aimed to identify the specification that best captures the relationship between remittances, FDI and GDP growth, as well as to test the following hypotheses:

- **H1: Remittances have a positive impact on long-term economic growth in economies heavily dependent on remittances.**
- **H2: Foreign direct investment (FDI) has a positive and significant impact on long-term economic growth.**
- **H3: The effect of FDI on growth is more stable and consistent than that of remittances.**

Table 2: Regression results (OLS / FE/ RE) with Hausman& LM

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	OLS	Fixed-effects	Random-effects
Constant	-0.215 (0.536)		0.949 (0.562)
Remittances	0.057 (0.047)	-0.034 (0.045)	0.011 (0.043)
FDI	0.178 (0.067)	0.219 (0.080)	0.197 (0.072)
Exports	0.062 (0.010)	0.059 (0.010)	0.060 (0.009)
Final consumption (FCE)	0.511 (0.073)	0.497 (0.063)	0.501 (0.069)
Gross capital formation (GCF)	0.065 (0.010)	0.061 (0.008)	0.063 (0.009)
Exchange rate (ln)	-0.220 (0.142)	-0.513 (0.352)	-0.298 (0.156)
Number of countries	10	10	10
Hausman chi2 (df)	8.392 (6)		
Hausman p-value	0.210		
LM Breusch–Pagan chi2 (df)	19.350 (1)		
	OLS	Fixed-effects	Random-effects
LM p-value	0.0000 11		
Observations	200	200	200
R	0.691	0.697	0.689
Adjusted R ²	0.681	0.673	0.679

* p < 0.1, ** p < 0.05, *** p < 0.01

Source: author's calculation

Source: autor's calculation

The analysed dataset comprises ten economies characterised by a high level of remittance dependency in GDP: Tajikistan, Lebanon, Samoa, Nepal, Gambia, Nicaragua, Honduras, Lesotho, El Salvador and Haiti. These countries vary greatly in terms of size, population and economic structure, bringing together Asian economies (Tajikistan, Nepal, Lebanon, Samoa), Latin American and Caribbean economies (Nicaragua, Honduras, El Salvador, Haiti) and African economies (Gambia, Lesotho). This structural diversity lends robustness to the analysis, as it allows common economic relationships to be identified in different institutional and demographic contexts. At the same time, the presence of small economies (e.g. Samoa, Gambia, Lesotho) alongside countries with relatively larger populations (such as Nepal, Tajikistan or Honduras) highlights the relevance of using panel models to capture both the variation between countries and the temporal dynamics within them.

The analysis of the results shows a good fit of the applied econometric models. The values of the coefficient of determination R^2 range between 0.689 and 0.697, indicating that the chosen specifications manage to explain approximately 69%–70% of the variation in the economic growth rate (GDPGROWTH) for the analysed sample. This level of explanatory power is considered high for macroeconomic panel models, where economic growth dynamics are influenced by a multitude of structural and cyclical factors that are difficult to capture in their entirety through a finite set of variables. The similar value of the coefficients of determination in the case of the three models (Pooling OLS, Fixed Effects and Random Effects) suggests that the relationships between the explanatory variables and the dependent variable are robust to different specifications. At the same time, these results confirm that the selected indicators: foreign direct investment (FDI), exports (EXP), final consumption (FCE), gross capital formation (GCF), remittances (REMITTANCES) and the exchange rate (EXCHRATE), are relevant for explaining the variation in the economic growth rate (GDPGROWTH) in the analysed context.

In terms of explanatory variables, foreign direct investment (FDI), exports, final consumption (FCE) and gross capital formation (GCF) have positive and statistically significant coefficients at the 1% level ($p < 0.01$) in all three models (Pooling, Fixed Effects and Random Effects). This result confirms the theoretical hypothesis that these factors contribute significantly to medium- and long-term economic growth in emerging and developing economies.

Furthermore, the significant effect of final consumption expenditure (FCE), reflected by a coefficient of approximately 0.5 p.p., can be explained by the Keynesian law of effective demand, according to which the level of production and employment is mainly determined by aggregate demand. In the economies analysed, where the high share of household consumption in GDP is combined with limited productive capacities, domestic demand plays a central role in generating economic growth, either through domestic income or through external capital inflows or remittances, which stimulate domestic production and national income, generating a multiplier effect in the economy. (World Bank, 2021).

Foreign direct investment (FDI) also has a positive and significant influence (coefficients between 0.178 and 0.219 p.p.), confirming the economic literature that highlights the contribution of foreign investment to technology transfer, job creation and the expansion of productive capacity (Nantharath & Kang, 2019).

Exports have a positive and significant impact on economic growth, with estimated coefficients ranging between 0.059 and 0.062 p.p. This result highlights the essential role of trade openness in the economies analysed, where external demand acts as an important driver of economic activity. By integrating into international markets, these economies can capitalise on the advantages offered by access to larger markets, economies of scale and specialisation, which contribute to increased productivity and diversification of the economic base. International trade also facilitates indirect technology transfer and stimulates domestic competitiveness, thereby strengthening long-term growth potential. (Forte & Moura, 2013; Das & Sethi, 2019; Tsaurai, 2023).

Gross capital formation (GCF) has a positive and significant impact on economic growth, with coefficients estimated between 0.061 and 0.065 p.p., significant at the 1% level ($p < 0.01$) in all model specifications (OLS, FE, RE). This result confirms the importance of domestic investment in supporting long-term economic development. The increase in the share of gross capital formation reflects the intensification of physical and infrastructural capital accumulation processes, which expand productive capacities and enhance growth potential.

Investments in infrastructure, equipment and new technologies generate spillover effects in the economy, stimulating productivity and promoting job creation. (Dine & Metwally, 2019)

On the other hand, remittances (REMITTANCES) do not have a statistically significant impact in any of the model specifications. The estimated coefficients vary slightly: they are positive in OLS (0.057) and in the RE model (0.011), but become slightly negative in the FE model (-0.034), and the p-values exceed 0.1 in all cases. This shows that, for the countries analysed, remittances do not consistently influence economic growth.

This trend is well documented in the literature on migration-dependent economies. Remittances contribute to poverty reduction and income stabilisation, but play a lesser role in stimulating sustainable economic growth. Without public policies that encourage the channelling of part of these flows into investment, through tax incentives, co-financing programmes or the development of financial infrastructure, their impact remains mainly passive: they support consumption but contribute less to capital formation and job creation. (Forte & Moura, 2013; Das & Sethi, 2019; Tsaurai, 2023).

The logarithmic exchange rate (EXCHRATE) has a coefficient of -0.298 in the random effects model, significant at the 10% level ($p < 0.1$). In OLS, the coefficient is -0.220, and in the fixed effects model it reaches -0.513, but in these cases it is not statistically significant. The results show that a depreciation of the local currency is associated, on average, with a decline in economic growth of approximately 0.3 percentage points.

This negative effect is explained by the fact that the economies analysed depend to a considerable extent on imports. When the currency depreciates, the costs of imported goods increase, which fuels inflation and reduces domestic purchasing power. Under these conditions, the potential competitive advantages for exports are largely offset by inflationary pressures. Moreover, in the absence of sufficiently robust export sectors or effective economic adjustment policies, devaluation does not generate real growth benefits but may exacerbate existing imbalances (Tsaurai, 2023; Nantharath & Kang, 2019).

To determine the most appropriate model, two diagnostic tests were performed.

The Lagrange Multiplier Breusch–Pagan test yielded: $\text{chisq} = 19.35$, $\text{df} = 1$, $p\text{-value} = 1.088\text{e-}05$, alternative hypothesis: significant effects, confirming significant individual effects (specific to each country) and justifying the use of panel models instead of Pooling OLS.

The Hausman test yielded: $\text{chisq} = 9.8464$, $\text{df} = 6$, $p\text{-value} = 0.1313$, alternative hypothesis: one model is inconsistent, suggesting that there is no systematic correlation between country-specific effects and regressors. Thus, the null hypothesis was not rejected, and the random effects model was selected as a consistent and efficient specification (Baltagi, 2008; Hausman, 1978; Wooldridge, 2010).

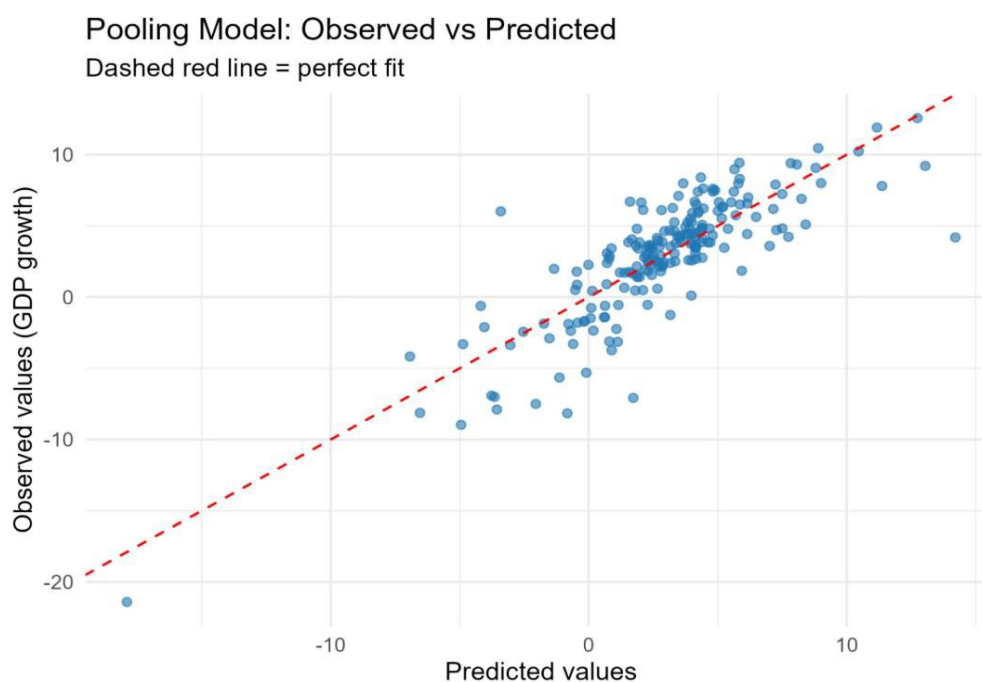


Figure 4. Pooling Model: Observed vs Predicted

Source: Author's graph based on author's calculation

The Pooling OLS model (**Figure 4**) shows a generally positive association between observed and predicted GDP growth values. However, the considerable dispersion of points around the dotted red line (the perfect fit line) indicates limited explanatory power. Since this model assumes complete homogeneity across countries, it does not take into account structural differences, such as economic size, institutional quality or political regimes, that influence growth performance (Baltagi, 2008).

Although the clustering model captures general trends, it oversimplifies the data structure by treating all observations as identical. This approach does not take into account the heterogeneity between countries and temporal variation, which are essential for panel data analysis. The relatively high dispersion of the points shows that the model captures the general directionality but performs poorly in explaining fluctuations within countries over time.

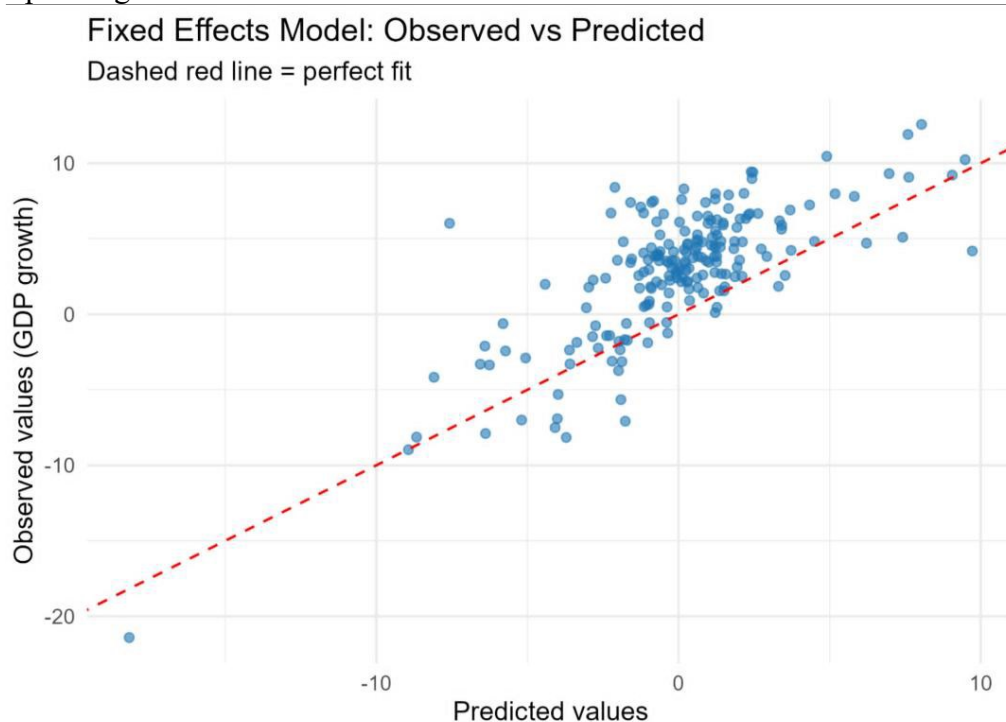


Figure 5. Fixed Effects Model: Observed vs Predicted

Source: Author's graph based on author's calculation

The fixed effects model (**Figure 5**) shows a much tighter grouping of points around the perfect fit line, demonstrating a substantial improvement in predictive accuracy. This model controls for unobserved, time-invariant characteristics specific to each country, such as geography, institutional framework, or long-term development strategies (Greene, 2012; Hsiao, 2014).

By isolating variations within the country, the fixed effects specification provides more accurate and consistent coefficient estimates, reducing systematic errors caused by omitted variables. The visual concentration of points near the reference line indicates that the model effectively captures how internal changes in consumption, investment, or trade affect economic growth in each country. However, as expected, the FE model may lose efficiency when variations between countries contain significant information, as it focuses exclusively on the temporal dynamics within each unit.

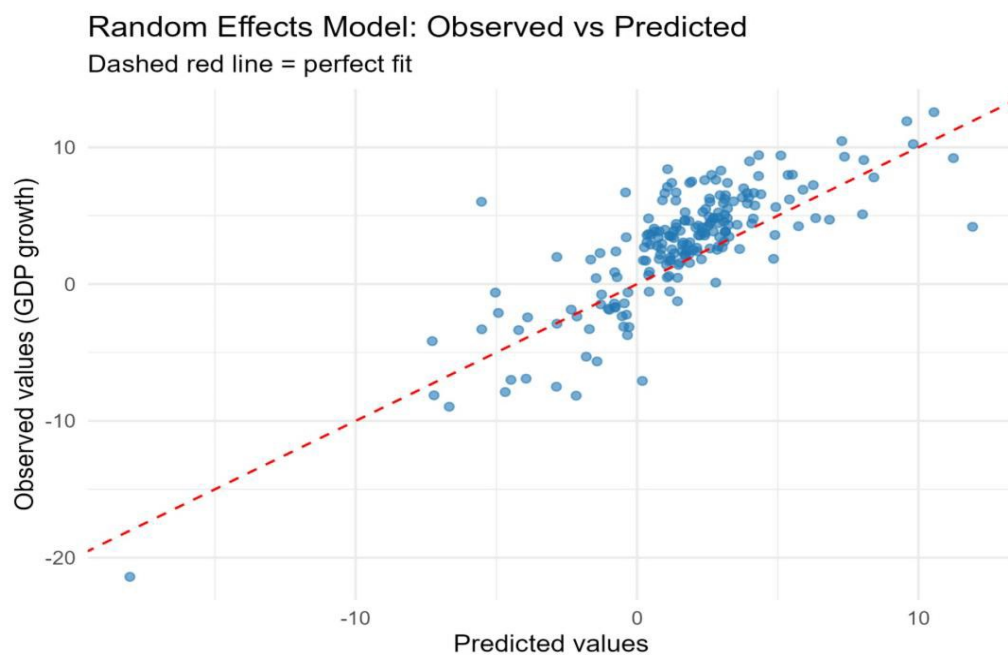


Figure 6. Random Effects Model: Observed vs Predicted

Source: Author's graph based on author's calculation

The random effects model (**Figure 6**) shows a similar fit between observed and predicted GDP growth values, with only slightly higher dispersion than the FE model. This model indicates that the RE estimator successfully captures both intra-country and inter-country variations (Hausman, 1978; Baltagi, 2008). The basic assumption of no correlation between country-specific effects and explanatory variables is consistent with the results of the Hausman test ($p=0.1313$), confirming the validity of the RE specification.

The graphical alignment of the points along the red dotted line demonstrates the robustness of the random effects model in predicting GDP growth while maintaining statistical efficiency. It provides a comprehensive picture of the dataset, leveraging information from both dimensions, time and cross-section, making it particularly suitable for panels with moderate heterogeneity.

A comparison of the three models reveals a clear progression in terms of accuracy and explanatory power. The Pooling OLS model offers the weakest fit, as shown by the scattered distribution of residuals, reflecting its inability to capture country-specific dynamics. The Fixed Effects model significantly improves explanatory performance by taking into account unobserved heterogeneity and isolating within country variations. The Random Effects model achieves a similar level of accuracy while maintaining efficiency due to its dual use of cross-sectional and temporal information.

Both statistically and graphically, the Random Effects specification outperforms the alternatives. The Lagrange Multiplier (Breusch-Pagan) test validates the use of panel models, while the Hausman test supports the consistency of the RE estimator. The close grouping of predicted and observed values in **Figure 6** confirms that the Random Effects model provides the best empirical representation of the data, balancing precision with generalisability.

The choice is logical both from a statistical perspective, as RE is efficient and consistent in the absence of correlation with unobserved effects, and from an economic perspective, as it allows for the simultaneous capture of variation between countries and within each country over time, which is essential for a sample consisting of diverse economies.

The analysed dataset comprises ten economies with a high degree of dependence on remittances: Tajikistan, Lebanon, Samoa, Nepal, Gambia, Nicaragua, Honduras, Lesotho, El Salvador and Haiti. These countries differ significantly in size, population and economic structure,

including Asian, African and Latin American economies. Structural diversity lends robustness to the analysis, as it allows common economic relationships to be captured across varied institutional and demographic contexts.

The results of the random effects model estimation show that the main determinants of economic growth are foreign direct investment (FDI), exports, final consumption expenditure (FCE) and gross capital formation (GCF), all of which have positive and statistically significant effects on the real GDP growth rate.

Foreign direct investment (FDI) has an estimated coefficient of 0.197, statistically significant at the 1% level ($p < 0.01$), indicating the robustness of the estimated relationship.

This suggests that a 1 percentage point increase in the share of FDI in GDP is associated, on average, with economic growth of approximately 0.20 percentage points. This result confirms the literature on the role of foreign investment in stimulating economic growth through technology transfer, job creation and expansion of productive capacities in developing economies. (Forte & Moura, 2013)

Exports (Exp) have an estimated coefficient of 0.06, which is statistically significant at the 1% level ($p < 0.01$), indicating a higher precision of the estimated relationship. This result suggests that a 1 percentage point increase in the share of exports in GDP is associated, on average, with economic growth of approximately 0.06 percentage points. This result highlights the importance of trade openness for small and open economies, where external demand plays a central role in sustaining economic activity. By integrating into international markets, these economies can exploit economies of scale, stimulate productivity growth and benefit from indirect technology transfers, thereby strengthening their long-term growth base.

Final consumption expenditure (FCE) has the highest coefficient, 0.501, which is significant at the 1% level ($p < 0.01$) and significant for the model studied. This means that a 1 p.p. increase in final consumption leads, on average, to economic growth of approximately 0.5 p.p., confirming the dominant role of domestic demand in determining economic growth. This result is in line with the Keynesian law of effective demand, according to which the level of production and employment is mainly determined by the dynamics of aggregate demand. (World Bank, 2021).

Gross capital formation (GCF) has a coefficient of 0.063, significant at the 1% level ($p < 0.01$). Thus, a 1 p.p. increase in the share of domestic investment in GDP leads, on average, to economic growth of 0.063 p.p. This result confirms the importance of domestic investment in infrastructure, physical and technological capital for sustaining long-term economic development.

Remittances are not statistically significant in any of the estimated models, as the coefficient is small (0.011) and insignificant ($p = 0.797$). This result indicates that, in the case of the countries analysed, remittances do not contribute systematically and robustly to real GDP growth, suggesting that these flows are predominantly directed towards current consumption and supporting household living standards rather than productive investment. (Fayissa & Nsiah, 2010)

Therefore, the insignificant result of remittances reflects the structure and destination of these flows rather than their lack of social importance. In the absence of public policies that encourage the channelling of a portion of remittances into productive capital through appropriate financial instruments, tax incentives or co-investment projects, their impact on economic growth remains largely passive.

The logarithmic exchange rate (Exchrte) has a coefficient of -0.298, significant at the 10% level ($p < 0.1$). This suggests that the devaluation of the local currency is associated with a decline in economic growth of approximately 0.3 p.p. The negative effect reflects the fact that, in the economies analysed, which are characterised by a high dependence on imports, currency depreciation leads to higher domestic prices and inflationary pressures, which offset any competitive advantages generated on the export side.

The results of the random effects model show that, while remittances have a positive but statistically weaker contribution to GDP growth, foreign direct investment (FDI) has a constant and

significant impact. This result is consistent with hypothesis H2 and confirms the conclusions of Forte and Moura (2013), who argue that the long-term effects of FDI stem from capital accumulation, technology transfer and managerial spillovers. In contrast, the weaker statistical significance of remittances partially supports hypothesis H1, indicating that although remittances support household consumption and cushion savings during periods of recession, their structural effect on production is less direct. The RE model thus confirms hypothesis H3, which posits that the influence of FDI is more stable and sustainable than that of remittances.

The overall pattern of results suggests that remittances and foreign direct investment (FDI) operate through different but complementary channels. Remittances increase aggregate demand in the short term, supporting the Keynesian mechanism of consumption-based economic growth (World Bank, 2021), while FDI stimulates long-term productive capacity, in line with endogenous growth theory (Nantharath & Kang, 2019). This distinction highlights the importance of policies that can transform remittance flows into productive investments, such as financial inclusion programmes, diaspora investment schemes, and favourable business environments. By strengthening these institutional links, remittance-dependent economies can bridge the gap between short-term stability and sustainable structural growth.

Therefore, the random effects model is adopted as the main specification for interpretation. It captures the structural diversity of remittance-dependent economies while effectively estimating the effects of key determinants of economic growth, remittances, foreign direct investment, exports, final consumption, gross capital formation, and exchange rates. This model confirms that FDI, consumption and capital formation exert strong positive effects on growth, while remittances play a more limited and short-term stabilising role, in line with the theoretical expectations discussed in the literature (Forte & Moura, 2013; Das & Sethi, 2019; Tsaurai, 2023).

LIMITATIONS OF THE RESEARCH AND DIRECTIONS FOR FUTURE STUDIES

The present analysis did not take into account the structural characteristics of the analyzed countries, such as territorial size and population, factors that may influence the degree of sensitivity of economies to external shocks. In future research, it would be useful to integrate these variables into an extended econometric model in order to highlight how the size of the economy and population density can amplify or mitigate the effects of global financial crises on remittance flows and economic growth. Furthermore, alternative analytical models could be explored, capable of more accurately capturing the complex interactions between external shocks, foreign direct investment, and remittances.

CONCLUSIONS

In conclusion, the econometric analysis performed on a sample of ten economies characterised by a high degree of dependence on remittances for the period 2005–2024 revealed a number of significant economic relationships, consistent with economic growth theories and recent literature. The Random Effects model, selected after applying the Breusch–Pagan and Hausman tests, proved to be the most appropriate specification for the structure of the analysed panel, providing consistent and efficient estimates.

The results of the analysis confirm that both remittances and foreign direct investment contribute to economic growth in remittance-dependent economies, but their influence differs in nature and magnitude. Remittances, while positive, have weaker and less stable effects on GDP growth, suggesting that they primarily support consumption and short-term welfare rather than stimulating structural transformation. Their ability to stabilise household incomes and maintain domestic demand remains essential for macroeconomic resilience, particularly during periods of global recession. However, without mechanisms to channel these flows into productive investment, their long-term growth potential remains limited.

Foreign direct investment has a stronger and statistically significant impact on economic performance, providing consistent evidence that it is a key driver of long-term growth. Its effects are closely linked to the expansion of productive capacity, technology transfer and the creation of employment opportunities. This stability reinforces the idea that investment-led growth is more sustainable and less dependent on cyclical fluctuations. Empirical findings indicate that economies able to maintain a stable investment climate and sound macroeconomic policies experience more predictable and robust growth trajectories.

A comparison of the two financial flows highlights their complementary rather than competitive nature. Remittances provide liquidity and stimulate consumption, while foreign direct investment enhances productivity and structural change. When effectively combined, these channels can create a balanced growth mechanism, in which short-term stabilisation supports the conditions necessary for long-term development. Such complementarity is particularly valuable for smaller economies with limited access to international capital markets, as it allows them to mitigate volatility while building domestic productive capacity.

The results also underscore the importance of institutional and policy frameworks in mediating the impact of external financial flows. Economies that strengthen governance, improve transparency, and maintain macroeconomic stability tend to attract more sustainable foreign investment and can more easily transform remittances into savings and entrepreneurial activity. Improving financial inclusion and providing investment incentives to the diaspora community can further amplify these positive effects by linking household income flows to national development objectives.

From a broader perspective, this research shows that external financial dependence does not necessarily imply vulnerability if it is managed within coherent policies. Remittances can play a crucial role in ensuring economic stability and social welfare, while foreign direct investment stimulates innovation, productivity and competitiveness. The main challenge for policymakers is to develop complementary strategies that transform remittance-driven consumption into productive outcomes, ensuring that both forms of external financing are mutually reinforcing rather than substitutive.

Comparative data suggest that the simultaneous presence of substantial remittance flows and foreign direct investment can enhance both resilience and growth potential. By aligning policies on financial inclusion, investment promotion and human capital development, remittance-dependent economies can overcome their dependence on external revenues and evolve towards a more diversified and sustainable development model. Integrating these flows into national strategies offers a path to inclusive and long-term economic progress that can withstand future global shocks. Overall, the findings confirm working hypotheses H2 and H3, showing that the effect of FDI on economic growth is significant and more stable than that of remittances, while hypothesis H1 is not empirically supported for the sample analysed. These results have clear economic policy implications: in order to harness the potential of remittances, it is necessary to channel them into productive investments, while stimulating FDI flows and strengthening external competitiveness through coherent trade and investment policies.

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