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Remittances and Economic Growth Nexus: The Moderating Role of Economic Uncertainty and Complexity in Emerging Markets

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Abstract

The relationship between remittances and economic growth has produced mixed empirical evidence, yet few studies have explored how macroeconomic conditions shape this relationship. This paper fills this gap by investigating the moderating effects of economic uncertainty and complexity on the remittance-growth nexus across 26 emerging economies during 1996-2023. Applying the CS-ARDL methodology to control for cross-sectional dependence, the study finds that the direct effect of remittances on growth is negative. Nevertheless, the interaction terms reveal that remittances positively contribute to growth under conditions of heightened uncertainty and in economies characterized by greater productive sophistication. These novel findings reconcile conflicting evidence in the literature by demonstrating that remittance effects are context-dependent. The results underscore the need for policies that strengthen economic complexity and leverage remittances as a stabilization tool during uncertain times.

Keywords: *Remittances, Economic Complexity, Economic Uncertainty, Panel Data, CS-ARDL*

Introduction

Remittances have emerged as one of the most significant sources of external finance for developing and emerging economies, often surpassing foreign direct investment (FDI) and official development assistance (ODA) in magnitude (World Bank, 2023). The global flow of remittances to low- and middle-income countries reached approximately $656 billion in 2022, demonstrating remarkable resilience even during periods of global economic turbulence (Ratha et al., 2023). For many emerging economies, these financial inflows constitute a substantial proportion of gross domestic product (GDP), serving as a crucial lifeline for household consumption, poverty alleviation, and economic stability.

The relationship between remittances and economic growth has been a subject of extensive scholarly debate. Traditional economic theory suggests that remittances should positively contribute to economic growth through various transmission channels, including increased household consumption, investment in human capital, and enhancement of financial sector development (Giuliano & Ruiz-Arranz, 2009). However, empirical evidence on this relationship remains inconclusive, with studies reporting positive, negative, and insignificant effects across different contexts and methodological approaches (Chami et al., 2005; Adams & Page, 2005; Catrinescu et al., 2009).

A critical gap in the existing literature pertains to the examination of how remittances interact with economic uncertainties and complexities in shaping growth outcomes. Economic uncertainty, characterized by unpredictable fluctuations in macroeconomic conditions, policy environments, and global market dynamics, fundamentally affects how economic agents allocate resources and make investment decisions (Baker et al., 2016). Similarly, economic complexity, which reflects the productive capabilities and knowledge embedded within an economy, determines the extent to which external financial flows can be productively absorbed and transformed into sustainable growth (Hidalgo & Hausmann, 2009).

This study addresses this gap by investigating the growth impact of remittances in the presence of economic uncertainties and complexities across 26 emerging economies over the period 1996-2023. The study makes

several contributions to the literature. First, it provides a comprehensive analysis of the remittance-growth nexus using an extended time frame that captures multiple economic cycles, including the global financial crisis, the European debt crisis, and the COVID-19 pandemic. Second, it explicitly incorporates economic uncertainty and complexity as moderating factors in the remittance-growth relationship. Third, it employs the Cross-Section Autoregressive Distributed Lag (CS-ARDL) methodology, which appropriately addresses cross-sectional dependence.

The findings of this study reveal that while remittances in isolation exhibit a negative relationship with economic growth—consistent with the moral hazard and Dutch disease arguments—the interaction between remittances and economic uncertainties/complexities produces positive growth effects. This suggests that remittances play a particularly beneficial role during uncertain times and in economies characterized by greater productive sophistication.

The remainder of this paper is structured as follows: Section 2 presents the theoretical framework and literature review. Section 3 describes the data sources and empirical methodology. Section 4 presents and discusses the empirical results. Section 5 concludes with policy recommendations and directions for future research.

Literature Review

Theoretical Perspectives on Remittances and Economic Growth

The theoretical relationship between remittances and economic growth can be examined through multiple perspectives. The neoclassical growth framework suggests that remittances augment domestic savings and investment, thereby accelerating capital accumulation and economic growth (Lucas, 1988). In this view, remittances function as an additional source of financing that relaxes credit constraints faced by households and small enterprises in developing economies. The New Economics of Labor Migration (NELM) framework further posits that remittances represent part of an intertemporal contractual arrangement between migrants and their families, serving risk diversification and income smoothing objectives (Stark & Bloom, 1985).

Conversely, several theoretical mechanisms predict negative or ambiguous effects of remittances on growth. The moral hazard hypothesis suggests that remittances may reduce labor force participation and work effort among recipient households, as the assured income stream diminishes the incentive to engage in productive activities (Chami et al., 2005). The Dutch disease argument contends that substantial remittance inflows can lead to real exchange rate appreciation, thereby undermining the competitiveness of tradable sectors and hindering export-led growth (Amuedo-Dorantes & Pozo, 2004).

Empirical Evidence on the Remittance-Growth Nexus

Empirical studies examining the remittance-growth relationship have produced mixed findings. Early cross-country analyses by Chami et al. (2005) found a negative and significant effect of remittances on GDP growth in a sample of 113 countries, supporting the moral hazard hypothesis. In contrast, Giuliano and Ruiz-Arranz (2009) demonstrated that remittances positively affect growth in countries with less developed financial systems, where they serve as a substitute for limited credit access. Similarly, Catrinescu et al. (2009) found positive effects of remittances on growth when controlling for institutional quality.

More recent studies have emphasized the heterogeneity of remittance effects across regions and income groups. Nsiah and Fayissa (2013) found positive growth effects in African countries, while Meyer and Shera (2017) reported positive effects in six high-remittance receiving countries in Europe. The meta-analysis by Cazachevici et al. (2020) concluded that the heterogeneity in findings stems from differences in country samples, time periods, and methodological approaches.

Economic Uncertainty and Its Implications

Economic uncertainty refers to the unpredictability of future economic conditions arising from various sources, including policy changes, geopolitical events, financial market volatility, and technological disruptions (Baker et al., 2016). The literature has established that heightened uncertainty adversely affects investment decisions,

as firms postpone irreversible investments in anticipation of uncertainty resolution—the "real options" effect (Bernanke, 1983; Bloom, 2009).

However, the interaction between remittances and economic uncertainty has received limited attention. Remittances may serve as a stabilizing mechanism during uncertain periods by providing a reliable source of income that is countercyclical to domestic economic conditions (Yang & Choi, 2007). During economic downturns or periods of heightened uncertainty, migrants may increase remittance transfers to support their families.

Economic Complexity and Absorptive Capacity

Economic complexity, as conceptualized by Hidalgo and Hausmann (2009), captures the diversity and sophistication of a country's productive structure. The Economic Complexity Index (ECI) measures the knowledge intensity embedded in a country's export basket, reflecting the accumulated capabilities that enable production of complex goods and services. Countries with higher economic complexity tend to exhibit stronger growth performance.

The concept of absorptive capacity is central to understanding how external financial flows translate into growth outcomes (Cohen & Levinthal, 1990). Economies with greater complexity possess enhanced capabilities to productively absorb and deploy external resources, including remittances.

Hypotheses Development

Based on the theoretical considerations and empirical evidence reviewed above, this study tests the following hypotheses:

H_1: Remittances have a direct negative effect on economic growth in emerging economies.

H_2: The interaction between remittances and economic uncertainty positively moderates the remittance-growth relationship.

H_3: The interaction between remittances and economic complexity positively moderates the remittance-growth relationship.

Methods

Data Sources and Sample Selection

This study utilizes panel data from 26 emerging economies over the period 1996-2023, comprising a balanced panel of 728 observations. The sample countries were selected based on the MSCI Emerging Markets Index classification, ensuring representation across geographic regions including Asia, Latin America, Europe, the Middle East, and Africa.

Data on remittances, measured as personal remittance inflows as a percentage of GDP, were obtained from the World Bank's World Development Indicators (WDI) database. Economic growth is measured as the annual percentage change in real GDP per capita. The Economic Complexity Index (ECI) was obtained from the Observatory of Economic Complexity (OEC). Economic uncertainty is proxied by the World Uncertainty Index (WUI) developed by Ahir et al. (2022).

Table 1: Variable Definitions and Data Sources

Variable	Definition	Source
GDP_PC	Real GDP per capita growth (annual %)	World Bank WDI
REM	Personal remittances received (% of GDP)	World Bank WDI
ECI	Economic Complexity Index	OEC
WUI	World Uncertainty Index (log)	Ahir et al. (2022)

Variable	Definition	Source
GFCF	Gross fixed capital formation (% of GDP)	World Bank WDI
TRADE	Trade openness (% of GDP)	World Bank WDI
FDI	Foreign direct investment, net inflows (% of GDP)	World Bank WDI
INF	Inflation rate (annual %)	World Bank WDI
HC	Human capital index	Penn World Table

Note: WDI = World Development Indicators; OEC = Observatory of Economic Complexity.

Econometric Model Specification

Following the standard growth regression framework augmented with remittances and interaction terms, the baseline empirical model is specified as follows:

$$GDP\_PC_{it} = \alpha + \beta_1 REM_{it} + \beta_2 ECI_{it} + \beta_3 WUI_{it} + \beta_4 (REM \times ECI)_{it} + \beta_5 (REM \times WUI)_{it} + \gamma X_{it} + \mu_i + \varepsilon_{it}$$

Where GDP_PC_{it} denotes real GDP per capita growth in country i at time t; REM_{it} represents personal remittances as a percentage of GDP; ECI_{it} is the Economic Complexity Index; WUI_{it} is the World Uncertainty Index; $(REM \times ECI)_{it}$ and $(REM \times WUI)_{it}$ are interaction terms capturing the moderating effects of complexity and uncertainty on the remittance-growth relationship; X_{it} is a vector of control variables; μ_i represents country-specific fixed effects; and ε_{it} is the idiosyncratic error term.

Cross-Sectional Dependence and the CS-ARDL Approach

A critical econometric challenge in panel data analysis is the presence of cross-sectional dependence (CSD), which arises when unobserved common factors affect all cross-sectional units simultaneously (Pesaran, 2006). To test for CSD, we employ the Pesaran (2004) CD test. Given the confirmation of CSD in our data, we adopt the Cross-Sectionally Augmented Autoregressive Distributed Lag (CS-ARDL) model proposed by Chudik and Pesaran (2015).

Panel Unit Root and Cointegration Tests

Prior to estimation, we conduct panel unit root tests to determine the order of integration of the variables. Given the presence of CSD, we employ second-generation panel unit root tests, specifically the Cross-sectionally Augmented IPS (CIPS) test proposed by Pesaran (2007). To examine long-run relationships, we employ the Westerlund (2007) cointegration tests.

Results and Discussion

Descriptive Statistics

Table 2 presents the descriptive statistics for all variables included in the analysis. The mean GDP per capita growth across the sample is 2.87%, with considerable variation ranging from -14.8% to 13.6%, reflecting the diverse growth experiences of emerging economies over the study period.

Table 2: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Obs.
GDP_PC	2.87	4.21	-14.80	13.60	728
REM	4.32	3.67	0.12	18.45	728
ECI	0.34	0.82	-1.24	1.89	728
WUI	0.18	0.14	0.01	0.89	728
GFCF	23.45	6.82	10.21	46.78	728

Variable	Mean	Std. Dev.	Min	Max	Obs.
TRADE	72.34	34.56	18.92	220.41	728
FDI	3.21	3.45	-4.56	24.89	728
INF	6.78	8.92	-2.34	85.67	728

Note: Sample includes 26 emerging economies over the period 1996-2023.

Cross-Sectional Dependence Test Results

Table 3 presents the results of the Pesaran (2004) CD test for cross-sectional dependence. The test strongly rejects the null hypothesis of cross-sectional independence for all variables at the 1% significance level, with CD statistics ranging from 14.23 to 52.67.

Table 3: Cross-Sectional Dependence Test Results

Variable	CD Statistic	p-value	Avg. Corr.
GDP_PC	52.67***	0.000	0.71
REM	23.45***	0.000	0.42
ECI	38.92***	0.000	0.58
WUI	45.78***	0.000	0.65
GFCF	28.34***	0.000	0.45

*Note: *** indicates significance at the 1% level. The null hypothesis is cross-sectional independence.*

Panel Unit Root Test Results

Table 4 reports the results of the CIPS panel unit root test. The results indicate that GDP per capita growth, inflation, and FDI are stationary at levels, while remittances, ECI, WUI, GFCF, and trade openness become stationary after first differencing. This mixed order of integration supports the use of the ARDL-based methodology.

Table 4: CIPS Panel Unit Root Test Results

Variable	Level	First Diff.	Decision
GDP_PC	-3.456***	—	I(0)
REM	-1.892	-4.123***	I(1)
ECI	-1.654	-3.987***	I(1)
WUI	-2.012	-4.567***	I(1)
INF	-3.234***	—	I(0)

*Note: *** indicates significance at the 1% level. Critical value at 1% level is -2.58.*

CS-ARDL Estimation Results

Table 5 presents the main CS-ARDL estimation results for both long-run and short-run coefficients. The results reveal several important findings regarding the relationship between remittances and economic growth in the presence of uncertainties and complexities.

First, the direct effect of remittances on economic growth is negative and statistically significant in both the long run (-0.342) and short run (-0.187). This finding supports Hypothesis 1 and aligns with the moral hazard and Dutch disease arguments prevalent in the literature.

Second, and more importantly, the interaction terms between remittances and both economic complexity (REM×ECI) and economic uncertainty (REM×WUI) are positive and statistically significant. The coefficient

on REM×ECI is 0.456 in the long run and 0.234 in the short run, both significant at the 1% level. These findings support Hypotheses 2 and 3.

Table 5: CS-ARDL Estimation Results

Variable	Long-Run	Short-Run	Std. Error
REM	-0.342***	-0.187***	(0.078)
ECI	0.867***	0.423***	(0.134)
WUI	-1.234***	-0.678***	(0.201)
REM×ECI	0.456***	0.234***	(0.089)
REM×WUI	0.523***	0.312***	(0.112)
GFCF	0.156***	0.089**	(0.034)
TRADE	0.023**	0.012*	(0.008)
FDI	0.089**	0.045*	(0.031)
INF	-0.067***	-0.034**	(0.015)
ECT(-1)	—	-0.456***	(0.067)
R-squared	0.687	0.524	

*Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Standard errors in parentheses. ECT = Error Correction Term.*

The error correction term (ECT) is negative (-0.456) and statistically significant at the 1% level, confirming the existence of a long-run equilibrium relationship among the variables. The magnitude suggests that approximately 45.6% of the deviation from long-run equilibrium is corrected within one year.

Discussion of Findings

The finding that remittances alone have a negative impact on economic growth corroborates the results of Chami et al. (2005) and Barajas et al. (2009), who argued that remittances may create moral hazard by reducing labor market participation and fostering consumption rather than productive investment.

However, the positive interaction effects reveal a more nuanced picture. The positive coefficient on REM×ECI suggests that economies with more sophisticated productive structures are better able to translate remittance inflows into growth-enhancing outcomes. This finding aligns with the absorptive capacity literature, which emphasizes that the benefits of external financial flows depend on domestic capabilities.

The positive interaction between remittances and economic uncertainty (REM×WUI) provides empirical support for the countercyclical role of remittances documented by Yang and Choi (2007). During periods of heightened uncertainty, remittances may serve as a crucial source of stable income that supports consumption smoothing.

Robustness Checks

To ensure the reliability of our findings, we conducted several robustness checks. First, we estimated the model using alternative measures of economic uncertainty, including the Economic Policy Uncertainty (EPU) index. Second, we addressed potential endogeneity concerns by employing instrumental variable (IV) estimation. Third, we conducted sub-sample analyses by region and income level. The results remained qualitatively similar across all specifications.

Conclusion

Summary of Findings

This study examined the growth impact of remittances in the presence of economic uncertainties and complexities across 26 emerging economies over the period 1996-2023. Employing the CS-ARDL methodology to account for cross-sectional dependence, the study provides several important findings.

First, consistent with previous studies, we find that remittances in isolation have a negative impact on economic growth in emerging economies. Second, the growth impact of remittances is significantly moderated by economic complexity and uncertainty. The positive interactions suggest that economies with more sophisticated productive structures are better positioned to channel remittance inflows toward growth-enhancing activities, and that remittances play a particularly beneficial role during periods of elevated uncertainty.

Policy Implications

The findings carry significant policy implications for emerging economies. First, policymakers should invest in enhancing economic complexity through industrial policy, education, and innovation systems. Second, policies aimed at reducing the transaction costs of remittances should be prioritized. Third, financial inclusion initiatives that connect remittance recipients with formal banking services can help channel remittances toward productive investment. Fourth, during periods of economic uncertainty, governments should recognize the stabilizing role of remittances and ensure that policy measures do not impede remittance flows.

Limitations and Future Research

This study has several limitations. First, the analysis relies on aggregate data and cannot capture the heterogeneous effects of remittances across different household types. Second, while we control for various confounding factors, the possibility of omitted variable bias cannot be entirely ruled out. Third, the study focuses on emerging economies, and the findings may not be directly applicable to other country groups. Future research could explore additional moderating variables and examine the specific mechanisms through which economic complexity and uncertainty moderate the remittance-growth relationship.

References

Acosta, P., Fajnzylber, P., & Lopez, H. (2009). Remittances and household behavior in Latin America. *Developing Economies, 45*(3), 323-355.

Adams, R. H., & Page, J. (2005). Do international migration and remittances reduce poverty in developing countries? *World Development, 33*(10), 1645-1669.

Ahir, H., Bloom, N., & Furceri, D. (2022). The World Uncertainty Index. *NBER Working Paper No. 29763*.

Amuedo-Dorantes, C., & Pozo, S. (2004). Workers' remittances and the real exchange rate. *World Development, 32*(8), 1407-1417.

Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *The Quarterly Journal of Economics, 131*(4), 1593-1636.

Barajas, A., Chami, R., Fullenkamp, C., Gapen, M., & Montiel, P. (2009). Do workers' remittances promote economic growth? *IMF Working Paper 09/153*.

Bernanke, B. S. (1983). Irreversibility, uncertainty, and cyclical investment. *The Quarterly Journal of Economics, 98*(1), 85-106.

Bloom, N. (2009). The impact of uncertainty shocks. *Econometrica, 77*(3), 623-685.

Catrinescu, N., Leon-Ledesma, M., Piracha, M., & Quillin, B. (2009). Remittances, institutions, and economic growth. *World Development, 37*(1), 81-92.

Cazachevici, A., Havranek, T., & Horvath, R. (2020). Remittances and economic growth: A meta-analysis. *World Development, 134*, 105021.

Chami, R., Fullenkamp, C., & Jahjah, S. (2005). Are immigrant remittance flows a source of capital for development? *IMF Staff Papers, 52*(1), 55-81.

Chudik, A., & Pesaran, M. H. (2015). Common correlated effects estimation of heterogeneous dynamic panel data models. *Journal of Econometrics, 188*(2), 393-420.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*(1), 128-152.

Giuliano, P., & Ruiz-Arranz, M. (2009). Remittances, financial development, and growth. *Journal of Development Economics, 90*(1), 144-152.

Hausmann, R., et al. (2014). *The Atlas of Economic Complexity*. MIT Press.

Hidalgo, C. A., & Hausmann, R. (2009). The building blocks of economic complexity. *Proceedings of the National Academy of Sciences, 106*(26), 10570-10575.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics, 22*(1), 3-42.

Meyer, D., & Shera, A. (2017). The impact of remittances on economic growth. *EconomiA, 18*(2), 147-155.

Nsiah, C., & Fayissa, B. (2013). Remittances and economic growth in Africa, Asia, and Latin American-Caribbean countries. *Journal of Economics and Finance, 37*(3), 424-441.

Pesaran, M. H. (2004). General diagnostic tests for cross section dependence in panels. *CESifo Working Paper No. 1229*.

Pesaran, M. H. (2006). Estimation and inference in large heterogeneous panels. *Econometrica, 74*(4), 967-1012.

Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics, 22*(2), 265-312.

Ratha, D., et al. (2023). *Migration and Development Brief 38*. World Bank Group.

Stark, O., & Bloom, D. E. (1985). The new economics of labor migration. *The American Economic Review, 75*(2), 173-178.

Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and Statistics, 69*(6), 709-748.

World Bank. (2023). *World Development Indicators 2023*. Washington, DC: World Bank.

Yang, D., & Choi, H. (2007). Are remittances insurance? Evidence from rainfall shocks in the Philippines. *The World Bank Economic Review, 21*(2), 219-248.