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REMITTANCES, INVESTMENT, AND ECONOMIC GROWTH: SUBSTITUTABILITY OR COMPLEMENTARITY?

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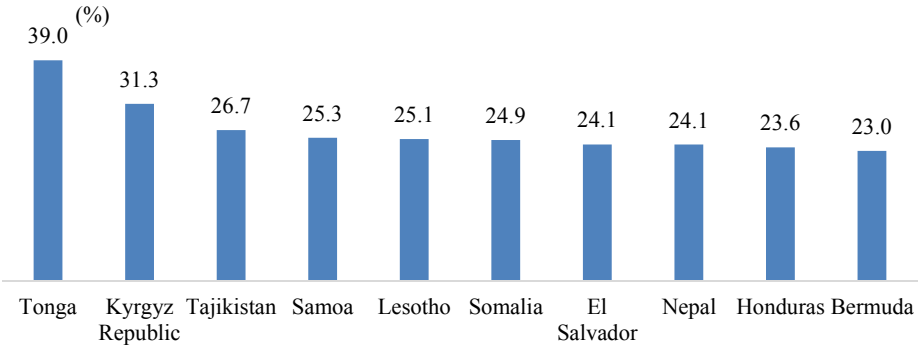
This study analyzes how overseas remittances can affect the economic growth of recipient countries through domestic investment. According to panel data of 162 countries for the period 2000-2020, remittances play a role in increasing economic growth through domestic investment. Additionally, when the sample countries are limited to low-income countries, remittances tend to have a positive effect on economic growth. However, the effect of remittances on economic growth is diminished when the level of domestic investment is low. Therefore, low-income countries should include remittances as a source of increased domestic investment in their implementation policy.

Keywords: Remittances, Economic Growth, Panel Data
JEL Classification: F22, F24, 040

1. INTRODUCTION

According to the World Bank (2022), overseas remittances to low- and middle-income countries (LMICs) were projected to reach $626 billion and global remittances were expected to reach $794 billion by 2022. Generally, workers' remittances to LMICs tend to exceed foreign direct investment (FDI) and official development aid (ODA). For example, for developing countries in the Middle East and North Africa (MENA), remittances provided the largest inflow of foreign capital since 2009 (World Bank, 2022). Remittance inflows from MENA countries were projected to exceed the sum of the FDI and ODA amounts by 2022. Developing countries tend to rely heavily on overseas remittances as a ratio of their gross domestic product (GDP). In Tonga, the Kyrgyz Republic, and Tajikistan, remittances accounted for 39.0%, 31.3%, and 26.7% of GDPs in 2020, respectively (Figure 1). As foreign capital, remittances are stable and play a role similar to that of permanent income (Edwards and Ureta, 2003). Because of these characteristics remittances are regarded as an important source of foreign capital in developing countries.



Note: Remittances are represented as percentages of the GDP of each country as of 2020.

Figure 1. Top 10 Countries that Received Remittances

Although several studies have discussed whether remittances can contribute to economic growth, the results have been mixed. Table 1 presents remittances as the ratio of a country's GDP and economic growth rate based on income level. Remittances as a ratio of a country's GDP tend to be about 2.0–2.4 times lower in low-income countries than in lower- and upper-middle-income countries.

Table 1. Remittances and Growth Rates by Income Levels

	Low-income (n = 276)	Lower-middle income (n = 485)	Upper-middle income (n = 85)
Remittances/GDP (%)	2.77	6.74	5.47
Growth rate (%)	1.27	2.424	2.421

Note: 1) Countries are classified by the income level definition of World Bank.
2) Author's calculation.

Source: World Development Indicators, World Bank.

If the reason for remittances is altruism rather than investment, it is feasible that remittances are underutilized as a source of domestic investment. In particular, when the use of remittances as a source of domestic investment capital is minimal, as in low-income countries, it cannot be directly associated with economic growth, as shown in Table 1.

This study empirically analyzes the level of domestic investment as an indirect route to determine whether the remittances of recipient countries can be utilized to spur economic growth. Therefore, we test the hypotheses that remittances can spur economic growth directly and that, as a source of increased domestic investment, they can help increase economic growth indirectly.

The remainder of this paper is organized as follows. Section 2 reviews the literature regarding the direct and indirect effects of remittances on economic growth. Section 3 discusses the estimation model and the research data. Section 4 presents the empirical results and the implications of this study. Finally, Section 5 presents the summary and conclusions of this research.

2. LITERATURE REVIEW

According to previous research, remittances tend to have a positive effect on poverty reduction, human capital formation, and consumption smoothing in the recipient country, and hence, they contribute to economic growth (Jongwanich, 2007; Yang and Choi, 2007; Nyamongo et al., 2012; Lartey, 2013; Azam, 2015; Eggoh et al., 2019).

Jongwanich (2007) obtained evidence that, in developing countries in Asia and the Pacific, remittances directly affect household income and consumption, thereby reducing poverty. Cooray (2012) found that, from 1970 to 2008, in South Asian countries, such as India, Sri Lanka, Pakistan, Bangladesh, Nepal, and the Maldives, the impact of remittances on economic growth appeared in the form of human capital through education. Moreover, Eggoh et al. (2019) observe that the economic-growth effect of remittances can be achieved above a certain threshold level of investment, consumption, and the development of financial markets. Remittances basically have the insurance function to cope with economic and social disasters by increasing temporary household income and helping with consumption smoothing (Yang and Choi, 2007).

Additionally, remittances are an important source of foreign capital for developing countries, which lack investment resources for economic growth. According to Giuliano and Ruiz-Arranz's (2009) study of 73 developing countries from 1975 to 2002, the effect of economic growth of remittances exists in countries with less developed financial markets. Therefore, in countries with low financial market development, overseas remittances can be used as financial resources for investment by easing credit constraints. Moreover, remittances have a positive effect on economic growth, and this effect is greater in countries where the financial market has been developed for Latin America and the Caribbean countries (Mundaca, 2009). Therefore, developing countries with more developed financial markets can accumulate capital through overseas remittances, thereby exerting a positive effect on the economic growth of the recipient country (Lartey, 2013).

Several studies used microdata. Households receiving remittances tend to engage in riskier entrepreneurial activities, undertake increased investment-related expenditures, and have reduced child labor hours (Yang, 2004). An analysis using data from Peru for the period 2007–2010 showed that households that received remittances sent their children to private schools rather than public schools (Salas, 2014). Therefore, remittances have a positive effect on human capital formation and thus, economic

growth.

Furthermore, previous studies have pointed out that excessive reliance on overseas remittances can negatively impact the economy as a whole. First, when there is an excessive inflow of remittances, households tend to have an incentive to reduce the labor supply and increase consumption. This exerts a negative effect on economic growth, particularly in large remittance-receiving countries. According to Sutradhar (2020), remittances sent far from the home country may be involved in a moral hazard problem, which can reduce the incentive to work in households and decrease the remittances sent from host countries. Moreover, when remittances are sent with an altruistic motive, they may not be used for productive purposes but rather for temporary consumption, such as in the case of non-durable goods. Second, excessive remittances can negatively affect economic growth by causing an appreciation in the real exchange rate. This in turn weakens the competitiveness of the export sector and widens the imbalance between export and non-export sectors (Amuedo-Dorantes and Pozo, 2004; Acosta et al., 2009). This negative effect of real-exchange-rate appreciation on an economy owing to an excessive inflow of foreign-capital-like remittances is known as the Dutch disease. Using data from 190 developing countries for the period 1990–2003, Lartey et al. (2012) find that an inflow of remittances has a statistically significant effect on the appreciation of a country's real exchange rate. This effect is stronger in developing countries with fixed exchange rates. Therefore, Dutch disease can occur in countries that rely excessively on overseas remittances (Lopez et al., 2007; Rabbi et al., 2013).

Another strand of research has found that the effect of remittances on economic growth may differ depending on the institutional quality of recipient countries. Catrinescu et al. (2009) find that remittances have a positive effect on economic growth, and that this marginal effect increases in countries with better institutions. Specifically, the lower the level of ethnic tension, the higher the quality of governance, the better the prevalence of laws and orders, and the greater the economic-growth effect of remittances. Bettin and Zazzaro (2012) find that appropriate market regulations, the absence of corruption in the financial system, and a higher degree of property rights protection have a significant impact on the economic growth generated by remittances. Chitambara (2019) conducted a panel analysis of 26 African countries for the period 1980–2014 and obtained similar results. Therefore, we can postulate that, in low-income countries, which tend to have poor institutional quality or less-developed financial markets, the economic growth generated by remittances may be hindered.

This study analyzes the effects of remittances on economic growth through a domestic investment channel. Current literature suggests that the influence of remittances on economic growth is contingent on the financial development level of nations that receive remittances.[1] However, studies that empirically investigate the

[1] Current literature (Giuliano and Ruiz-Arranz, 2009; Mundaca, 2009; Rao and Hassan, 2011; Bettin and Zazzaro, 2012; Cooray, 2012; Lartey, 2013; Eggoh et al., 2019; Sobiech, 2019) highlights the marginal effect of remittances on economic growth through financial markets.

impact of overseas remittances on economic growth via domestic investment are limited. This study seeks to address these gaps in the literature.[2] To this end, this study strives to identify the association between the remittances of recipient countries and their domestic investment that impacts economic growth.

3. MODEL

To analyze the direct and indirect effects of remittances on economic growth, the estimation model in Equation (1) was established. This model is an extended version of Barro's growth model (1996, 2003).

$$GROWTH_{it} = \beta_0 + \beta_1(INV)_{it} + \beta_2(REMIT)_{it} + \beta_3(INV \times REMIT)_{it} + \beta_4(GOV)_{it} + \beta_5(POP)_{it} + \beta_6(INF)_{it} + c_i + \mu_{it}, \quad (1)$$

where subscript i denotes the individual country and subscript t denotes the year, respectively. The dependent variable on the left-hand side of Equation (1), $GROWTH$, is the growth rate of real per capita GDP of individual country i in year t. INV represents gross fixed capital formation as a percentage of GDP, whereas $REMIT$ represents personal remittances as a percentage of GDP. The interaction term ($INV \times REMIT$), which is multiplied by domestic investment and remittances as a ratio of GDP, is introduced to verify the marginal effect of remittances on economic growth via the investment path. GOV refers to the general government's final consumption expenditure as a percentage of GDP, and POP represents population growth. Finally, INF stands for the level of inflation in each country, c_i represents a country fixed effect, and μ_{it} is an error term.

Previous studies obtained empirically mixed results regarding the direct effect of remittances on economic growth. Therefore, it is difficult to make an a priori prediction for β_2, which shows the direct effect of remittances on economic growth. However, remittances can have a significant impact on economic growth of low-income countries with credit constraints. If we limit the analysis to countries with low-income levels, β_2 is expected to have a positive value. This implies that remittances have a direct positive effect on the economic growth of low-income countries.

In particular, remittances can play a role in resolving the bottleneck of insufficient investment in remittance-receiving countries with severe credit constraints. If an indirect

[2] While Eggoh et al.'s (2019) empirical strategy is similar to that used in this study, they do not consider the income level of remittance-recipient countries. The economic growth effect of remittances via investment may be more evident in low-income countries because they generally suffer from a lack of domestic investment in economic growth.

or marginal effect is observed, then the sign of β_3 is expected to be positive. Moreover, it is possible that there is an indirect diminishing effect due to the low level of domestic investment, and the sign of β_3 may have a negative value.

Regarding the control variables, because the investment variable is expected to have a positive effect on economic growth, the sign of β_1 is expected to be positive. An increase in government consumption implies a high degree of government intervention in the market. Consequently, β_4 is expected to have a negative value. Furthermore, a high population growth rate is expected to have a negative effect on economic growth, and a high inflation level indicates overall macroeconomic instability. Thus, the signs of β_5 and β_6 are both expected to be negative. All variables are based on the World Development Indicators (WDI) of the World Bank. The summary statistics for these variables are listed in Table 2.

Table 2. Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
GROWTH (%)	2,978	1.98	4.73	-79.06	28.54
INV (%)	2,978	23.31	7.25	2.84	81.02
REMIT (%)	2,978	4.11	6.20	0	44.13
GOV (%)	2,978	16.22	7.74	0.95	115.93
POP (%)	2,978	1.32	1.23	-3.85	7.35
INF (%)	2,978	5.38	13.51	-10.07	557.20
Dummy variable					
Low income	2,978	0.11	0.32	0	1
Lower-middle	2,978	0.29	0.45	0	1
Upper-middle	2,978	0.28	0.45	0	1

Source: Author's calculation.

Table 3. Correlation Matrix

	GROWTH	INV	REMIT	GOV	POP	INF
GROWTH	1.000					
INV	0.153*	1.000				
REMIT	0.018	0.005	1.000			
GOV	-0.127*	0.088*	0.007	1.000		
POP	-0.131*	0.016	-0.076*	-0.155*	1.000	
INF	-0.052*	-0.031	0.044*	-0.069*	0.038*	1.000

Note: * indicates significance at the 5% level.

As shown in Table 2, the average values of the real economic growth rate and remittances-to-GDP ratio for the period 2000–2020 are 1.98% and 4.11%, respectively. Tajikistan recorded a maximum remittance-to-GDP ratio of 44.126% in 2008.

The pairwise correlation of variables is presented in Table 3. The real economic growth rate and remittances are positively correlated but are not statistically significant. As expected from Barro's (1996, 2003) growth model, domestic investment is positively correlated with real economic growth at the 5% significance level. Furthermore, government expenditure, the population growth rate, and inflation are negatively correlated with economic growth at the 5% significance level. Because pairwise correlation merely indicates correlation and not causation, it is necessary to estimate the economic growth effect of remittances using Equation (1).

4. EMPIRICAL INVESTIGATIONS

The result of the pooled OLS regression, including the income level dummy variables, is presented in column (1) of Table 4.

The coefficient of the remittance variable is -0.213, which is statistically significant at the 1% level. The coefficient of the interaction term between domestic investment and overseas remittances is 0.007, which is statistically significant at the 5% level. The significantly negative coefficient of remittances shows that the inflow of remittances has a negative impact on economic growth, which is consistent with previous studies. The interaction term shows that there is an investment path that affects economic growth generated by remittances in recipient countries. This result indicates that remittances can be used as a source of funds to spur economic growth through the domestic investment channel.

Column (2) of Table 4 presents the estimation results of the fixed effects with autocorrelation of order 1, and column (3) presents the result of the random effects with autocorrelation of order 1. In columns (2) and (3), the remittance variables also show statistically negative values at the 1% level. The interaction terms are statistically positive at the 5% level in column (2) and at the 1% level in column (3).

By utilizing the fixed effects model by the Hausman test, we can calculate the threshold point of domestic investment to positively impact economic growth based on the result of column (2). Differentiating the economic growth variable from the remittance variable shows the marginal effect (or investment path effect), as expressed by Equation (2) below. Equation (2) shows that the effect of overseas remittances on economic growth depends on the level of domestic investment. The positive impact of overseas remittances on economic growth was calculated when the ratio of domestic investment to GDP exceeds 42.9%.[3]

[3] The threshold point is obtained as $-\hat{\beta}_2/\hat{\beta}_3 = 0$ in Equation (2).

$$\frac{\partial(GROWTH)_{it}}{\partial(REMIT)_{it}} = \hat{\beta}_2 + \hat{\beta}_3 \times (INV)_{it} \quad (\hat{\beta}_2 < 0,\ \hat{\beta}_3 > 0) \tag{2}$$

Table 4. Remittances, Investment, and Economic Growth [a),b)]

	(1) Pooled OLS	(2) [c)] Fixed Effects with AR (1)	(3) [c)] Random Effects with AR (1)	(4) Panel GMM
INV	0.078***	0.070***	0.062***	0.464***
	(0.024)	(0.03)	(0.019)	(0.174)
REMIT	-0.213***	-0.300***	-0.275***	1.277*
	(0.081)	(0.103)	(0.070)	(0.659)
INV× REMIT	0.007**	0.007**	0.009***	-0.053*
	(0.003)	(0.003)	(0.003)	(0.029)
GOV	-0.096***	-0.394***	-0.131***	-0.269***
	(0.018)	(0.037)	(0.016)	(0.067)
POP	-0.828***	-0.296	-0.809***	
	(0.091)	(0.247)	(0.119)	
INF	-0.023***	-0.033***	-0.023***	
	(0.008)	(0.008)	(0.007)	
Income level dummy included [d)]	YES	NO	YES	NO
Constant	2.197***	7.445***	3.062***	
	(0.662)	(0.591)	(0.568)	
No. of countries		161	162	22
AR(1)				0.043
AR(2)				0.219
Sargan				0.232
R^2	0.087	0.058	0.042	
Obs.	2,978	2,816	2,978	376

Notes: a) Robust standard errors in parentheses.

b) *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

c) The Hausmann test is rejected (χ^2 = 84.50).

d) The income level dummy represents low-income, lower-middle-income, and upper-middle-income countries.

The control variables show results that are consistent with expectations. Column (1) to (3) show that the investment variable has a statistically positive coefficient at the 1% level, whereas government expenditure has a statistically negative coefficient at the 1% level. The population growth rate variable shows a statistically negative value at the 1%

level, except for column (2). Additionally, inflation appears statistically negative at the 1% level. These results indicate that the estimation model is appropriate.

Column (4) presents the result obtained from the generalized method of moments (GMM) for panel data by limiting the sample countries to low-income countries. The GMM estimation should pass two tests: a test of overidentification restrictions and a test for second-order serial correlation in the error term. In this study, the Sargan test was used for overidentification restrictions to determine whether the instruments were valid. The second-order serial correlation test, which checks that there is no second-order serial correlation in the error term, was conducted based on Arellano and Bond's (1991) study. The results of the Sargan and autocorrelation tests were satisfactory, and the result of GMM estimation was valid.

Contrary to the previous estimation results that include all countries, as shown in column (4), the remittance variable is statistically positive at the 10% level. Moreover, the interaction term is statistically negative at the 10% level. Although there are weak significance levels for the remittance and interaction term variables, we can calculate the marginal effect of remittances on economic growth depending on the domestic investment level. This is expressed in Equation (3) by the economic growth variable from the remittance variable similar to Equation (2).

$$\frac{\partial (GROWTH)_{it}}{\partial (REMIT)_{it}} = \hat{\beta}_2 + \hat{\beta}_3 \times (INV)_{it} \quad \left(\hat{\beta}_2 > 0,\ \hat{\beta}_3 < 0\right). \tag{3}$$

Equation (3) implies that, for low-income countries, the impact of overseas remittances on economic growth negatively depends on the level of domestic investment ($\hat{\beta}_3 < 0$). The positive effect of remittances ($\hat{\beta}_2 > 0$) on economic growth is realized when domestic investment as a percentage of GDP exceeds 24.1%. Otherwise, the marginal effect of remittances through the domestic investment channel diminishes. These results show that, in low-income countries, remittances can directly increase economic growth. However, below a certain domestic investment level, an indirect diminishing effect is observed.[4] In low-income countries, remittances may not be linked to domestic investment. This finding provides further evidence that remittances are not being used more productively in low-income countries.

5. CONCLUSION

This study analyzed the panel data of 162 countries for the period 2000–2020 and obtained the following results. First, the inflow of overseas remittances has a negative

[4] The GMM estimation results for the lower- and upper-middle-income countries are insignificant. These results show that the indirect diminishing effect of remittances can be identified only when the income level of a country is considered. However, this topic requires further investigation.

impact on economic growth when income levels are not considered. This finding supports the view of previous studies that remittances negatively affect economic growth by reducing the incentive to work, thereby decreasing labor supply and appreciating the real exchange rate-that is, the Dutch disease.

Moreover, this study empirically verifies that the investment path of remittances toward economic growth is indirect. The interaction term between investment and remittances is statistically positive. The negative coefficient of remittances and the positive coefficient of the interaction term imply that, although remittances have a negative impact on economic growth, they have an increasing marginal effect on economic growth via the domestic investment channel.

Interestingly, according to the panel GMM estimation, the direct and indirect effects of remittances on economic growth had opposite signs compared to the previous results. In low-income countries, remittances tend to boost economic growth. However, economic growth may be hindered if a country has a low level of domestic investment relative to its GDP. This shows that low-income countries with insufficient investment as well as credit constraints arising from underdeveloped financial markets are likely to be limited in their ability to utilize remittances to spur economic growth.

Therefore, to strengthen the domestic investment path of remittances that affect economic growth, it is necessary to implement policy measures to raise the level of domestic investment by creating well-functioning financial markets. Furthermore, appropriate policies that lower the cost of remittances, thereby facilitating their use as a source of foreign capital, should be implemented.

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