

## Do governance indicators have a role in remittances-growth nexus in Egypt?

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### Abstract

**Purpose** — Drawing on annual data from 1996 to 2022, this study aims to examine the effect of Egypt's real GDP growth.

**Methods** — Autoregressive Distributed Lag (ARDL) and Cointegration technique are applied by first examining the stationarity of the series by utilizing the Augmented-Dicky-Fuller (ADF) unit root test. The bound cointegration test is then implemented to evaluate the existence of cointegration among the variables.

**Findings** — The results indicate that the GDP growth rate has a long-run positive relationship with remittance inflows in Egypt. This paper also finds that the average governance indicators in Egypt, which include government effectiveness, political stability, control of corruption and regulatory quality, voice and accountability, and the rule of law, could help facilitate the long-run effect of remittances on GDP growth.

**Implication** — The findings imply that maintaining high levels of governance indicators is essential for helping Egypt benefit from remittances and enhancing its economic growth.

**Originality/value** — The study is a pioneer in including the average governance indicators in the remittance-growth nexus study for Egypt. Its purpose is to assess whether governance quality affects the nexus and whether there exists a threshold for the average governance indicators below which the flow of remittances does not encourage economic growth.

**Keywords** — Remittances, economic growth, ARDL model, governance indicators.

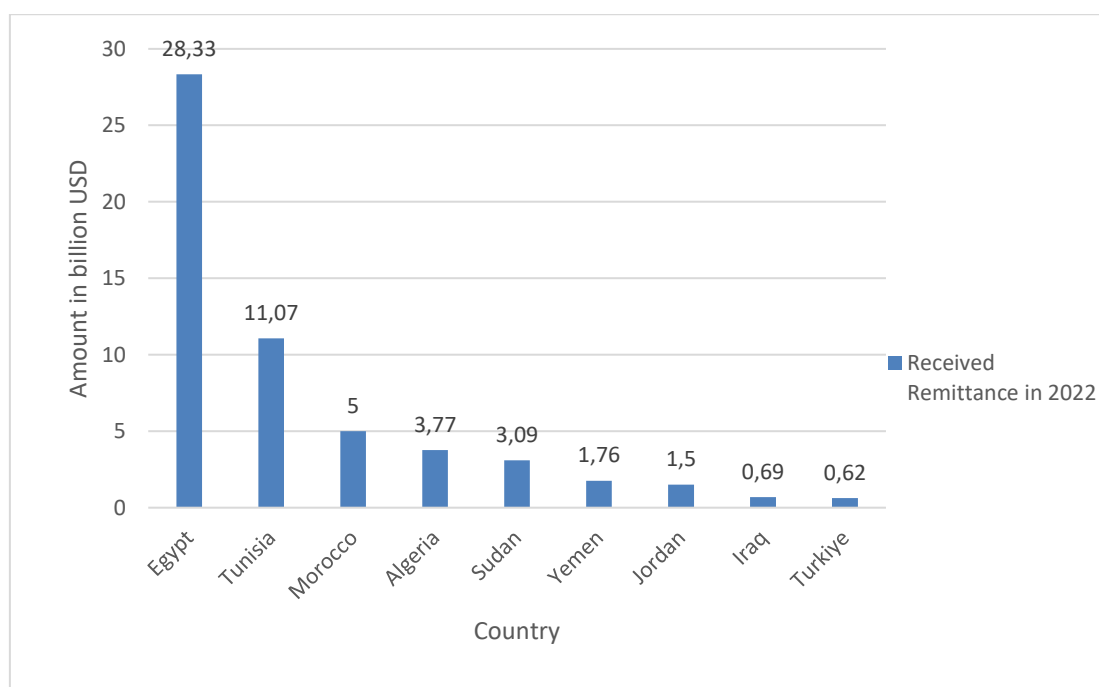
## Introduction

Remittance<sup>1</sup> plays an essential role in economic prosperity by activating the function of sending money from migrant employees to their households. This process will revive growth in remittance flows globally, with approximately an annual average of US\$ 123.7 billion from 1970 to 2000, about US\$418 billion in 2010, and US\$766 billion in 2022. In recent years, remittance flows to developing countries have exceeded the total amount of foreign direct investment and official development assistance, and this difference is growing (World Bank, 2024). According to the DESA (2020) report, remittances go first to lower middle income and with a higher share to the low-income countries. According to the OECD, Egypt is the fifth-highest beneficiary of remittances globally, with USD 28.3 billion in 2022, accounting for about 10% of GDP. The importance of this paper

<sup>1</sup>Workers' or migrant remittances are defined as a portion of earnings in cash or goods that migrants send home to support their families.

lies in the fact that remittances play a more significant role in the inflow of global money for several emerging economies. This is especially the case for Egypt, where remittances show three times the impact compared to foreign direct investment (FDI) and foreign aid. Analyzing the impact of remittances has received much attention since the 1990s (see [Elsadig & Rahim, 2023](#)).

Remittances are drawing more attention due to the enormous volume of outflows into developing countries and their impact on the receiving nations' economies. Egypt is among the top five emerging economies receiving remittances in 2023. Remittances to the MENA region increased by 80.6%, around US \$67 billion, between 2010 and 2022, whereas the growth rate for all low and middle-income countries combined was 95.2%. The top nine MENA countries in terms of remittance recipients in 2022 are Egypt, Morocco, Jordan, Yemen, Tunisia, Algeria, Sudan, Turkey, and Iraq (see Figure 1), with the highest and lowest ranked countries receiving US\$28.33 and US\$0.6 billion, respectively, according to the World Bank ([World Bank, 2024](#)).



**Figure 1.** Top 9 remittance-receiving countries in MENA region.

[Chenery \(1967\)](#) postulates that the theory of the Harrod-Domar growth model has been used to explain how developing countries can close the savings-investment gap by taking advantage of remittances and foreign inflow. As a developing country, Egypt gained quite significantly from remittances brought in by millions of Egyptians working overseas to support their families and communities; remittances are an essential source of income for Egypt. Egypt's economy relies heavily on remittances since they provide a reliable source of foreign currency and maintain the nation's balance of payments. Additionally, remittances support economic expansion and the fight against poverty, enhancing millions of Egyptians' living standards. One of the main advantages of Egypt is that it has a large population of more than 100 million in 2022, and over half of its citizens are young, aged 25. As a result, Egyptians have become highly mobile and established strong communities throughout most Arab states, especially in Libya, Iraq, Jordan, and the Gulf Cooperation Council states ([Sadiq & Tsourapas, 2021](#)). Economic remittances were seen as a significant source of personal income in Egypt.

Despite remittance's growing importance in the overall international financial inflows, the nexus between remittance and economic growth has yet to be extensively explored, especially in Egypt. Also, several empirical literature exploring the relationship between remittance inflow and economic growth are inconclusive. While some studies found remittances to be positively linked with economic growth ([Abdulai, 2023](#); [Yavuz & Bahadir, 2022](#); [Cazachevici et al., 2020](#); [Matuzeviciute & Butkus, 2016](#); [Rehman et al., 2021](#); [Chowdhury, 2016](#)) others found no significant

or negative relationship between economic growth and remittances (Alhassan, 2023; Anetor, 2019; Jushi et al., 2021; Sutradhar, 2020; Ustarz & Issahaku, 2017; Sobiech, 2015). The results of these studies vary due to variations in the data and methodology employed and the conditions of each country under study. The relationship between remittances and economic growth has drawn significant attention in recent years, yet the literature has yet to determine the nature of these relationships. Some literature has indicated that remittances stimulate economic growth by stimulating the consumption function; however, other research has discovered evidence indicating remittances have a negative or no effect on economic growth. Olayungbo and Quadri (2019) examined the association between remittance inflows, financial development, and economic growth from 2000 to 2015 in 20 sub-Saharan African countries. Applying the PMG estimates and vector autoregressive (VAR) techniques, the study revealed a positive long-run and short-run relationship between remittances and human development. Rehman et al. (2021) examined the impact of remittance inflows on private investment in six Western Balkan countries using the GMM methodology from 2000 to 2017. Their finding revealed that remittance inflow positively influenced private investment and improved economic growth for these countries.

Similarly, Islam (2022) examined the association between remittances and economic growth using data for the period 1986-2019 using a panel of some selected Asian economies by applying generalized least squares (GLS) and the fully modified ordinary least squares (FMOLS) techniques technique. The result of this study suggests that remittances are an essential key factor in improving the economic growth of the countries under study. Imai et al. (2014) investigated the impact of remittances on GDP per capita growth for annual panel data for 24 Asia and Pacific countries from 1980 to 2009. By using the same previous technique, Chowdhury (2016) assessed the basic Solow growth model by investigating the relationship between foreign remittance and financial development for 33 top remittance recipient developing countries from 1979 to 2011, and the result indicates that the remittances significantly influenced economic growth. The most recent study by Abdulai (2023) investigated the impact of remittances on GDP growth in Ghana from 1990 to 2020 using the ARDL estimation technique. The results show a long-run relationship between remittances and several macroeconomic indicators, namely population growth rate, FDI, unemployment rate, inflation, and globalization, with economic growth.

While the above literature shows that the inflow of remittances essentially promotes the economic growth of the recipient countries directly or indirectly by improving the financial development indicators, several studies have concluded that remittances are negatively linked or have no effect on economic growth. Using the VAR model, Jushi et al. (2021) examined the relationship among remittances, trade openness, foreign direct investment (FDI), and economic growth in Western Balkan countries. Their result suggested that remittances are insignificant in explaining the variation in economic growth of these countries. Sobiech (2015) examined the effect of remittances on economic growth in a panel of 54 developing countries from 1970 to 2010.

Similarly, Oteng-Abayie et al. (2020) used the ARDL technique to investigate the impact of remittances on economic growth in Ghana's case. Their result revealed that the economic growth of Ghana County is negatively affected by the inflow of remittances in the long run. Tchekoumi and Nya (2023) applied panel smooth threshold regression (PSTR) and Generalized Method of Moments (GMM) methods to analyze the impact of migrant remittances on economic growth for six African countries in the CEMAC zone from 1990 to 2018. The result shows that remittances would affect the economic growth of these countries depending on their trade openness level, political stability, and private investment.

The literature on the impact of remittances on economic growth shows that it not only failed to provide a clear-cut answer on the specific impact of remittances on economic growth but also ignores the role of average governance indicators and their moderating effect with remittance inflows that enhance growth. This study narrows the gap in previous literature by concentrating on the Egyptian country, which needs to be covered by studies, and controlling for the role of governance to capture the quality of institutions in Egypt using the ARDL technique. The current study fills this gap in the literature by employing a more sophisticated econometric technique and including governance quality indicators to evaluate the impact of remittances on economic growth

in Egypt. The remainder of this study is organized as follows. Section 2 outlines the methodology and data employed. Section 3 presents the estimation results and offers a discussion of the results. Section 4 concludes.

## Methods

### Data Source

The study relies on macro-level data from 1996 to 2022, constructed from the [World Bank \(2024\)](#) Database. Firstly, the study applies Unit root tests to justify the stationarity of the series by utilizing the Augmented-Dicky-Fuller (ADF) method ([Dickey & Fuller, 1979](#)). It then employs the bound cointegration test to evaluate the series' cointegration after ensuring no unit roots. The bound F-statistic is used to verify the null hypothesis that there is no level cointegration versus the alternative that there is level cointegration. We reject the null hypothesis and accept the alternative that there is a long cointegration between the variables if the calculated F-statistic is greater than the critical value from the F-statistic of the upper bound. We estimate the conditional ARDL long-run model for long-run association among the series. In determining the responsiveness of growth rate to remittances in functional form, the study follows the empirical model of ([Bucevska, 2022](#); [Abdulai, 2023](#)) with a modification by adding the role of governance indicators as follows:

$$GDP = f(\text{INF, POPGRO, FDI, REMIT, GOV. IND, UNEMP, TRADE, ODAA, GOV. EXP, INVES}) \quad (1)$$

where REMIT is the remittances received, INF is the inflation rate measured by the consumer price index (CPI), GOV.IND is the average of six governance indicators to measure the quality of institutions in Egypt; UNEMP is the unemployment rate. The rest of the variables are defined in Table 1.

**Table 1.** Variables and their Measurements

Variable	Measurement	Symbol	Unit	Source
GDP growth rate	Annual percentage growth rate of GDP at market prices based on constant local currency (2015 prices)	GDP	Percent	World Bank
Inflation rate	Inflation measured by percentage change in consumer price index (CPI).	INF	Percent	World Bank
Population growth rate	Annual population growth rate for year t is the exponential rate of growth of midyear population from year t-1 to t, expressed as a percentage.	POPGRO	Percent	World Bank
Foreign direct investment	Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP	FDI	Percent of GDP	World Bank
Remittances	International migrants' remittances received as a share to GDP.	REMIT	Percent of GDP	World Bank
Quality of institutions	It is the average of six governance indicators that include government effectiveness, political stability, control of corruption and regulatory quality, voice and accountability, and the rule of law to measure the quality institutions in Egypt.	GOV. IND	Estimated	World Bank

Variable	Measurement	Symbol	Unit	Source
Unemployment rate	the share of the labor force that is without work but available for and seeking employment	UNEMP	Percent	World Bank
Trade	Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.	TRADE	Percent of GDP	World Bank
Net official development assistance	Net official development assistance is disbursement flows. Net official development assistance (ODA) consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients.	ODAA	Percent of GDP	World Bank
Government expenses	Cash payments for operating activities of the government in providing goods and services. It includes compensation of employees (such as wages and salaries), interest and subsidies, grants, social benefits, and other expenses such as rent and dividends.	GOV.EXP	Percent of GDP	World Bank

## Model

The linear form of Equation 1 is as follows:

$$GDP_t = a_0 + a_1 INF_t + a_2 POPGRO_t + a_3 FDI_t + a_4 REMIT_t + a_5 GOV.IND_t + a_6 UNEMP_t + a_7 TRADE_t + a_8 ODAA_t + a_9 GOV.EXP_t + \varepsilon_t \quad (2)$$

There are several advantages of using the ARDL approach in this study. Firstly, it is more reliable to deal with series that are integrated of different order to capture the short-run and long-run impact of our interest variables, and secondly, its apparent superiority over the conventional or widely utilized cointegration models of Johansen test (Johansen & Juselius, 1990) and Engle-Granger (Engle & Granger, 1987). More importantly, the advantage is its capacity to hypothesises on the estimated coefficients in the long run and reliability for small samples (Menegaki, 2019) and the way of dealing with endogeneity issues by providing lags into the model (Abdulai, 2023). The ARDL method estimates both short and long-run parameters simultaneously and is specified as follows:

$$\begin{aligned} \Delta GDP_t = & \beta_0 + \beta_1 GDP_{t-1} + \beta_2 INF_{t-1} + \beta_3 POPGRO_{t-1} + \beta_4 FDI_{t-1} + \beta_5 REMIT_{t-1} + \beta_6 \\ & GOV.IND_{t-1} + \beta_7 UNEMP_{t-1} + \beta_8 TRADE_{t-1} + \beta_9 ODAA_{t-1} + \beta_{10} GOV.EXP_{t-1} + \\ & \sum_{r=1}^q \varphi_1 \Delta GDP_{t-r} + \sum_{r=1}^k \varphi_2 \Delta INF_{t-r} + \sum_{r=1}^k \varphi_3 \Delta POPGRO_{t-r} + \\ & \sum_{r=1}^k \varphi_4 \Delta FDI_{t-r} + \sum_{r=1}^k \varphi_5 \Delta REMIT_{t-r} + \sum_{r=1}^q \varphi_6 \Delta GOV.IND_{t-r} + \\ & \sum_{r=1}^k \varphi_7 \Delta UNEMP_{t-r} + \sum_{r=1}^k \varphi_8 \Delta TRADE_{t-r} + \sum_{r=1}^k \varphi_9 \Delta ODAA_{t-r} + \\ & \sum_{r=1}^k \varphi_{10} \Delta GOV.EXP_{t-r} + \mu_t \end{aligned} \quad (3)$$

In equation (3)  $\Delta$  is the difference operator,  $\beta_0$  is the intercept term while  $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9$ , and  $\beta_{10}$  represent the coefficients of the long run relationship between the variables in the model, whereas,  $\varphi_1, \varphi_2, \varphi_3, \varphi_4, \varphi_5, \varphi_6, \varphi_7, \varphi_8, \varphi_9$  and  $\varphi_{10}$  reflect the coefficients of the short run dynamics,  $q$  indicate lags of the regressors, and  $\mu_t$  represent the error residuals. The null hypothesis of the bounds testing for our model is that the coefficients of the lag level variables are zero; hence, there is no cointegration between the included variables.

After revealing a cointegration among variables, both short- and long-run relationships would be specified. Therefore, the short-run coefficients are determined by estimating an error correction model (ECM) as follows:

$$\begin{aligned} \Delta GDP_t = & \sum_{j=1}^p \varphi_1 \Delta GDP_{t-j} + \sum_{j=1}^q \varphi_2 \Delta INF_{t-j} + \sum_{j=1}^q \varphi_3 \Delta POPGRO_{t-j} + \\ & \sum_{j=1}^q \varphi_4 \Delta FDI_{t-j} + \sum_{j=1}^q \varphi_5 \Delta REMIT_{t-j} + \sum_{j=1}^q \varphi_6 \Delta GOV.IND_{t-j} + \\ & \sum_{j=1}^q \varphi_7 \Delta UNEMP_{t-j} + \sum_{j=1}^q \varphi_8 \Delta TRADE_{t-j} + \sum_{j=1}^q \varphi_9 \Delta ODAA_{t-j} + \\ & \sum_{j=1}^q \varphi_{10} \Delta GOV.EXP_{t-j} + \Phi ECM_{t-1} + \mu_t \end{aligned} \quad (4)$$

Where  $\Phi$  measures the speed of adjustment toward the long-run equilibrium level and should be significantly negative. In a structural ECM, the long-run equilibrium level is progressively reached by at least one linear combination of variables at a constant adjustment rate (Abdulai, 2023). Diagnostic tests will ensure the model is stable and free of heteroskedasticity and serial correlation.

## Results and Discussions

### Descriptive Statistics

Table 2 provides a comprehensive descriptive analysis, shedding light on the distribution of the variables. Notably, it reveals that the average value of remittance inflows to Egypt over the study period is 6.39 percent as a share of GDP. Over 25% of Egyptians reside in developed countries (Zohry, 2013).

Over the period under study, gross domestic product has grown on average by 4.429%, indicating that Egypt's growth rate is quite good. On average, Egypt received more official development assistance (ODAA) (21.452 percent growth) than FDI (2.295 percent growth). Egypt relies heavily on ODAA and needs to do more to provide incentives to attract foreign direct investment. Investment recorded the third-highest mean (18.729 as a share of GDP) over the period, suggesting that capital formation and technical progress still account for approximately 19 percent of economic growth. For standard deviation, which measures the variation of the observed variable from its mean, government expenditure (GOV.EXP) and trade openness (TRADE) is revealed to be the most volatile among the variables, and population growth is the most stable. Governance indicators that capture the quality of institutions in Egypt recorded the lowest mean of -3.88 over the studied period. The negative figure may reflect that not much has been done to control corruption, improve transparency, and maintain a high level of political stability and absence of violence.

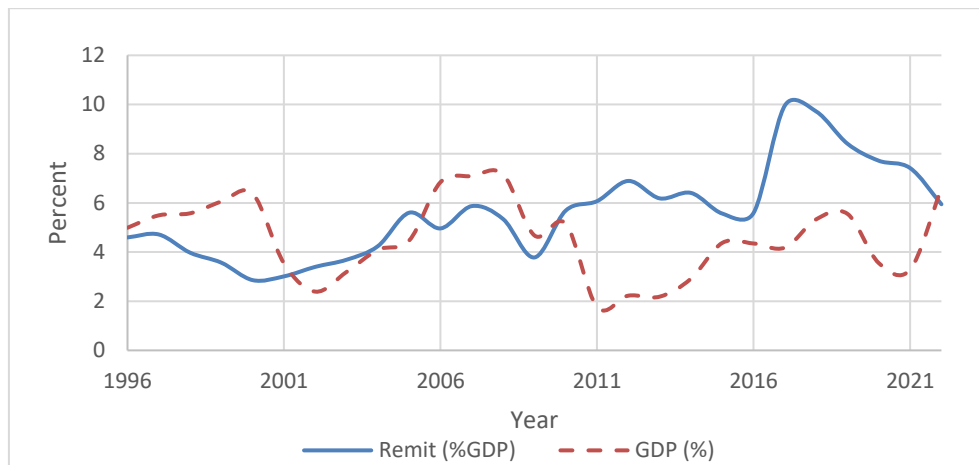
**Table 2.** Descriptive Statistics of the Variables

Variables	Observation	Mean	Std. Dev.	Min	Max
GDP	33	4.429	1.579	1.125	7.156
INF	33	9.989	5.882	2.269	29.506
POPGROTH	33	2.085	.213	1.569	2.564
FDI	33	2.295	2.221	-.204	9.348
REMIT	33	6.397	2.756	2.856	14.583
GOV. IND	32	-.6129	.2002	-.9146	-.3109
UNEMP	33	9.904	1.796	6.591	13.154
TRADE	33	46.956	10.752	29.856	71.680
ODAA	32	21.452	.862	18.755	23.001
GOV.EXP	33	10.761	1.571	7.268	12.755

Note: Source: Authors' calculations.

Data Source: World Bank Development Indicators

Figure 2 assesses the trend of remittances and economic growth over the period. It shows that remittances and GDP remained positive and fluctuated stochastically until 2010. Remittances increased slightly throughout the Egyptian revolution in 2011 despite a significant decrease in GDP. Both remittances and GDP growth fluctuated from 2012 to 2016, and increased afterward. Low production and economic growth occurred during this period due to more violent and unstable government institutions, creating uncertainty. The impact of the COVID-19 pandemic, which has affected psychological well-being and global sustainability, has negatively decreased remittances and economic growth.



**Figure 2.** The Trend of Gross Domestic Product and received remittances as % of GDP

### Stationarity Test

Conducting a stationarity test is crucial when dealing with time series data as it allows for the identification and prevention of spurious regressions in the model. Several studies confirmed that time series are non-stationary series that provide spurious results unsuitable for forecasting, analysis, or policymaking (Nkoro & Uko, 2016). To test the stationarity of the individual series in the regression model and determine the order of integration of the variables, the Augmented Dicky Fuller (ADF) test is applied for this process.

Table 3 shows the unit root test statistics. It indicates that when the model includes an intercept, none of the variables were stationary at levels except inflation and GDP but became stationary after first differencing. The ARDL model can be used since none of the model's variables are integrated of order two or I(2).

**Table 3.** Unit Root Test Result (ADF)

Variable	Level Form ADF		First Differenced ADF	
	Intercept	Prob.	Intercept	Prob.
GDP	-3.154	0.023**	5.981	0.000 ***
INF	-3.482	0.016**	-6.153	0.000 ***
POPGRO	2.322	0.975	-3.842	0.008 ***
FDI	-1.701	0.374	-4.421	0.001 ***
REMIT	-0.572	0.285	-5.924	0.000 ***
GOV.IND	-1.326	0.604	-6.210	0.000***
UNEMP	-2.324	0.180	-2.677	0.091*
REMIT_GOV.IND	-2.173	0.220	-3.937	0.005***
TRADE	-2.085	0.280	-5.013	0.000 ***
ODAA	-1.306	0.695	-6.243	0.000 ***
GOV.EXP	-2.589	0.240	-5.974	0.000 ***

Note: Source: Authors' calculations.

\*, \*\* and \*\*\* denote significance at 10%, 5% and 1% levels respectively.

### Bounds Test for Cointegration

Using the bound cointegration test to determine whether the data-generating process underlying a time series is a trend or first difference, we applied the F statistics to evaluate the significance of the lagged levels of the variables in a univariate equilibrium correction model. The F-statistic value of 13.250, as presented in Table 4, far exceeds the value of the upper bound, I(1), at a 5% significant level. As a result, we accept the alternative hypothesis and conclude that long-run joint cointegration exists.

The ARDL framework was applied to estimate the long-run coefficients after demonstrating a long-run relationship between gross domestic product (GDP) and the covariates using the bound test for cointegration. Table 4 shows that GDP has a long-run relationship with received remittances (REMIT), Inflation (INF), population growth (POPGRO), foreign direct investment (FDI), governance indicators (GOV.IND), unemployment rate (UNEMP), trade (TRADE), official developmental assistance (ODA), government expenditure (GOV.EXP) and the interaction of governance indicators and remittances (REMIT\_GOV.IND). The coefficient associated with remittances is positive and statistically significant at 5%, suggesting that personal remittances positively affect GDP growth in the long run. More precisely, a unit increase in remittance inflows increases growth in GDP by 9.28 units, *ceteris paribus*. The result is expected since a portion of remittance inflows is used for feeding, and the rest is invested in developmental projects, promoting economic growth.

**Table 4.** Bound Test Results

F- bounds Test				
H0: No levels relationship				
Test Statistic	Value	Sig	I(0)	I(1)
F-Stat	13.2501	10%	1.91	3.02
K	8	5%	2.29	3.30
		2.50%	2.45	3.4
		1%	2.72	4.0

Source: Authors' calculations.

This result is consistent with those of (Abdulai, 2023; Islam, 2022; Adnan et al., 2020; Oteng-Abayie et al., 2020). It is, however, at variance with the findings of (Ustarz & Issahaku, 2017; Sutradhar, 2020). Also, foreign direct investment (FDI) is generally considered a driving factor to economic growth, and our result shows that FDI positively relates to economic growth, suggesting that, in the long run, foreign direct investment boosts the economic growth of Egypt. Foreign direct investment (FDI) is generally considered a driving factor to economic growth, and the result in Table 4 indicates that, in the long run, foreign direct investment encourages economic growth in Egypt. This positive sign of FDI is as expected given that FDI inflow is increasing significantly in developing countries, which has a spillover effect in Egypt by transferring technology and human capital skills development. This result is in line with that of (Sarker & Khan, 2020; Elsadig & Rahim, 2023).

**Table 5.** Long-run effect of Remittance on GDP

Levels Equation			
Model: ARDL (1,1,2,0,2,2,1,1)			
Variable	Coefficient	Std. Error	Prob.
INF	-0.143	0.197	0.130
POPGRO	37.251	5.754	0.000
FDI	0.911	0.162	0.000
REMIT	9.285	1.354	0.000
GOV.IND	0.602	0.131	0.000
REMIT_GOV.IND	- 0.819	0.123	0.000
TRADE	0.139	0.021	0.000
ODAA	0.341	0.159	0.051

Source: Authors' calculations.



Table 5 shows that in the long run, trade openness, which proxies' globalization, appears with expected signs and contributes significantly to the economic growth of Egypt. The coefficient associated with trade openness indicated that Egypt's growth rate would go up by 0.139 percentage points for every percentage point increase in trade volume, holding all other variables constant. All things being equal, population growth reveals positive and strongly affects the economic growth of Egypt in the long run. Although there are many studies on these associations, there needs to be more agreement on how population expansion affects economic growth (Arbia et al., 2023). While some studies demonstrate that robust population expansion promotes economic growth Peterson (2017), others find evidence to support the contrary conclusion (Alemu & Zegeye, 2024).

In the long run, official development assistance (ODA) has a positive and high magnitude coefficient, as expected, suggesting that ODA eventually supports the expansion of Egypt's economy. More precisely, its coefficient indicated that Egypt's growth rate would go up by 0.341 for every percentage point increase in official development assistance, holding all other variables constant. The outcome demonstrates that inflation appears with a negative sign when it enters the equation, suggesting that inflation at any level negatively impacts economic growth. It is neither desired nor expected that inflation would improve the economic growth of Egypt since higher inflation never leads to higher levels of income in the medium and long run since it does not enhance economic development (Hadush et al., 2023). The unemployment variable is statically significant in explaining the variation of the GDP.

The governance indicators need to be included in the literature on the remittance-growth nexus. The coefficient of governance indicators is positive and statistically significant at 5%, indicating that average governance indicators positively affect GDP growth in the long run. A one percentage point increase in average governance indicators increases growth in GDP by 0.602 percentage points, holding all other variables constant. This finding is congruent with that of (Acemoglu & Robinson, 2012 and Han et al., 2014). Several studies also argued that remittance varies substantially according to the regulatory environment and across countries (Authers & Leatherby, 2019). We, therefore, included the interaction term to capture the threshold of average governance indicators level that can support remittances to have a beneficial influence on economic growth. The interaction term (REMIT\_GOV.IND) adversely impacted growth in the long run, suggesting that increases in remittance inflows will continue leading to a decline in growth rate if estimated average governance indicators in Egypt remain within a threshold of 20%<sup>2</sup>, holding all other variables constant.

### Short-run Dynamics

The long-run, short-run, and error-correction term (ECT), which measures the rate of adjustment necessary to return equilibrium following disruption, are the three parts of the ARDL. As shown in Table 6, under (CointEq), the ETC is statistically significant at the 1% significance level and exhibits the predicted negative sign. This result supports the bound test's earlier finding that there is a long-term link between the variables. The ETC proposes that GDP growth variations (i.e., growth above or below the equilibrium level) be adjusted at a rate of 1.491 units per year to maintain long-run convergence to equilibrium. According to short-run projections, remittances positively and considerably impact GDP growth. However, the GDP growth is adversely and considerably affected by its one-lag time.

Table 6 indicates that in the short term, trade and foreign direct investment all positively and significantly impact GDP growth. FDI and official development assistance (ODA) positively and significantly impact GDP growth during its one-lag period. The interaction term between remittances and estimated average government indicators has a negative short-term impact on GDP growth. It implies that increased remittance inflows will sustain growth rate increases as long as Egypt's average government indicators stay above a threshold of 8.57%, all other things being equal.

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<sup>2</sup> This figure is calculated by using a threshold model established by (Hansen, 1999) and extended by (Alfada, 2023).

**Table 6.** Short-Run Remittance impact on GDP growth

ARDL Error Correction Regression			
Model: ARDL (1,1,2,0,2,2,1,1)			
Case 3: No Trend with unrestricted Constant			
Variable	Coefficient	Std. Error	Prob.
C	-419.063	24.399	0.000
D(REMIT)	7.842	0.5243	0.000
D(REMIT(-1))	-2.233	0.212	0.001
D(FDI)	0.903	0.084	0.000
D(FDI(-1))	-1.191	0.145	0.000
D(REMIT_GOV.IND)	-1.891	0.061	0.000
D(POPT GROWTH)	120.411	11.545	0.000
D(POP GROW(-1))	-60.221	9.222	0.000
D(TRADE)	0.021	0.007	0.022
D(ODA)	0.815	0.079	0.000
D(INFLATION)	-0.081	0.122	0.013
D(INFLATION(-1))	-0.121	0.010	0.000
D(GOV.EXP)	0.772	0.021	0.000
CointEq(-1)*	-1.491	0.101	0.000
R-squared	0.949		
S.E. of regression	0.580		
Log likelihood	-16.910		
Schwarz criterion	2.680		
F-statistic	42.248		
Prob(F-statistic)	0.000		

Note: Source: Estimation from data.

### Residual and Diagnosis Test

Several diagnosis tests are conducted in this study to check the model's goodness-of-fit and validity of the assumptions. The Jarque-Bera test, the Breusch-Godfrey serial correlation LM test, and the Breusch-Pagan residual test are used to test serial correlation, heteroscedasticity, and normality, respectively, to assess the stability and dependability of the estimated models used in this study. Since the probability value of the F-statistic is greater than the significance level of 5%, the findings in Table 7 show that the data has a normal distribution and that the model does not suffer from the heteroskedasticity issue.

**Table 7.** Results of Residual and Stability Tests

Method	F-Statistic	Prob.
Serial Correlation	29.622	Prob. F(2,6) = 0.001
Heteroscedasticity	11.842	Prob. F(20,8) = 0.446
Normality (Jarque-Bera)	1.390	0.520, Normal

Source: Estimation from data.

In the context of remittances and economic growth in Egypt, this paper has provided valuable insight into the economic influence of flowing remittances on the economic growth from 1996 to 2022. The empirical results of the augmented ARDL bounds testing approach to cointegration suggested a long-run relationship between GDP and remittances received in Egypt. The increasing flow of remittances into Egypt's economy encourages its GDP growth rates in the long and short run. This result is consistent with those of (Abdulai, 2023; Islam 2022; Adnan et al. 2020; Oteng-Abayie et al. 2020; Imai et al. 2014). It is, however, at variance with the findings of (Ustarz & Issahaku 2017; Sutradhar 2020).

Since most emerging economies rely on FDI to fuel economic expansion, the coefficient associated with FDI suggested a significant impact on the GDP growth rate in both runs, as shown in previous results. Globalization, which is proxied by trade openness, plays an important role in

determining the economic growth in Egypt in both the short and long run. These results support the idea that countries are opening to free trade to become more integrated to achieve quicker economic growth through the inflow of technology, goods, and services (Islam, 2022; Alamoudi, 2024). The result demonstrates that inflation enters the equation with a negative sign, indicating that inflation, regardless of magnitude, hurts economic growth. Since rising inflation never raises income levels over the medium and long term and does not promote economic development, it is neither desired nor expected that inflation will accelerate Egypt's economic growth (Mohamed & Abdi, 2024).

The significance finding of this paper is by including the governance indicators on the remittance-growth nexus. The magnitude impact of governance indicators suggesting that on average governance indicators positively affect GDP growth in the long run and the result congruent with that of (Acemoglu & Robinson, 2012 and Han et al. 2014). It is also argued by several studies that remittance substantially varies according to the regulatory environment and across countries (see Authers & Leatherby, 2019). It suggests that a high average of World Governance Indicators (WGIs) is necessary for Egypt to gain from remittances and accelerate its economic growth. Stated differently, Egypt may enhance its economic growth through remittance inflow only to the extent that its government maintains stability in governance metrics. Therefore, the analysis is predicated on the knowledge that, provided Egypt remains over the average governance indicator threshold, the remittance flow might be highly beneficial in promoting rapid economic growth.

This finding underscores the crucial role of effective government indicators in driving economic growth. Countries with more robust governance indicators tend to achieve higher levels of economic growth, a finding that aligns with previous studies emphasizing the importance of governance in development. To further deepen our understanding, we have examined the threshold of average governance indicators level that can support remittances to benefit economic growth. In doing so, we have included the interaction term between remittances and average governance indicators (REMIT\_GOV.IND). The result has indicated that increases in remittance inflows will continue to decline the growth rate if estimated average governance indicators in Egypt remain within a threshold of 20%, holding all other variables constant. This result and several studies consider a nonlinear relationship between a country's institutional quality and economic growth. Dokas et al. (2023) have found a corruption threshold around which corruption's effect on economic growth changes from positive to negative. Also, Alfada (2023) finds that provinces of Indonesia with low corruption levels support their economic growth when the number of corruption cases is below the corruption threshold, however, when it reaches a threshold, it impedes economic progress in provinces with high levels of corruption. Therefore, the impact of remittances and other macroeconomic variables varies according to each country's circumstances of its quality toward the governance indicators.

## Conclusion

This study offers comprehensive insights into the relationship between remittances, governance indicators, trade, foreign direct investment (FDI), and inflation on Egypt's economic growth from 1996 to 2022. The findings reveal the existence of a long-term positive relationship between remittances and GDP growth, with the former acting as a catalyst for both short-term and long-term growth in Egypt. FDI and trade openness increasingly support economic expansion, while inflation consistently hampers growth prospects, indicating that price stability is critical for sustainable development. Importantly, the interaction between remittances and governance quality highlights that effective governance not only strengthens the positive impact of remittances on growth but also mitigates the adverse impact of poor institutional quality. Further, threshold analysis shows that when governance indicators fall below a certain threshold, remittance inflows do not contribute to economic growth, indicating that the impact of governance is nonlinear on economic performance.

The results provide several important policy implications. First, improving governance through strengthening transparency, accountability and controlling corruption is critical to

maximizing the economic benefits of remittances. Improving institutional quality to meet and exceed governance indicator thresholds can create a more conducive environment for economic growth by attracting remittances and ensuring their productive use. Second, policies to stabilize inflation must remain a priority, because inflation always hinders economic growth. Third, encouraging trade openness and maintaining FDI inflows is necessary to encourage technology transfer and support sustainable growth. Finally, policymakers must be aware of the context-specific nature of macroeconomic variables and governance indicators, so as to adapt governance reforms to effectively support remittance inflows. Overall, these strategies can strengthen Egypt's economic resilience and increase remittance flows to achieve long-term prosperity

## References

- Abdulai, A. M. (2023). The impact of remittances on economic growth in Ghana: An ARDL bound test approach. *Cogent Economics & Finance*, 11(2), 2243189. <https://doi.org/10.1080/23322039.2023.2243189>.
- Alamoudi, A. M. (2024). Does Control of Corruption Matter in the Nexus between Trade Openness and Economic Development? The Case of Saudi Arabia. *Global Journal of Economics and Business*, 14(3), 242-250. <https://doi.org/10.31559/GJEB2024.14.3.4>
- Mohamed, A. A., & Abdi, A. H. (2024). Exploring the dynamics of inflation, unemployment, and economic growth in Somalia: a VECM analysis. *Cogent Economics & Finance*, 12(1). <https://doi.org/10.1080/23322039.2024.2385644>
- Acemoglu, D., & Robinson, J. A. (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. New York: Crown Business.
- Adnan, K., Yin, K., Adrian, C. C., Cristina, G. Z., Sun, Q., & Duan, W. (2020). Is the relationship between remittances and economic growth influenced by the governance and development of the financial sector? New evidence from the developing countries. *Romanian Journal of Economic Forecasting*, 23(1), 37–56.
- Authers, J., & Leatherby L. (2019). *As China's Debt Balloons, Other Emerging Markets Fail to Take Of*. <https://www.bloomberg.com/graphics/2019-emerging-markets-debt/>. Accessed 8 Apr 2020.
- Anetor, F. O. (2019). Remittances and Economic Growth Nexus in Nigeria: Does financial sector development play a critical role?. *International Journal of Management, Economics and Social Sciences*, 8(2), 116–135. <https://doi.org/10.32327/IJMESS/8.2.2019.8>
- Alemu, T. A., & Zegeye, M. B. (2024). Empirical investigation on the dynamics effects of population and economic growth in Ethiopia: an application of the VEC model. *Cogent Social Sciences*, 10(1). <https://doi.org/10.1080/23311886.2024.2338861>
- Alhassan, U. (2023) E-government and the impact of remittances on new business creation in developing countries. *Economic Change Restructuring* 56:181–214. <https://doi.org/10.1007/s10644-022-09418-z>.
- Alfada, A. (2023). The destructive effect of corruption on economic growth in Indonesia: A Threshold model, *Heliyon*, 5(10). <https://doi.org/10.1016/j.heliyon.2019.e02649>
- Arbia, A., Sobhi, K., Karim, M., & Eddaou M. (2023). FDI, Information and Communication Technology, and Economic Growth: Empirical Evidence from Morocco. *Advances in Management and Applied Economics*. 13(6), 1-10. <https://doi.org/10.47260/amae/13610>.
- Bucevska, V. (2022). Impact of Remittances on Economic Growth: Empirical Evidence from South-East European Countries. *South East European Journal of Economics and Business*, 17(1), 79-94. <https://doi.org/10.2478/jeb-2022-0006>.
- Chenery, H.B. (1967). Foreign Assistance and Economic Development. In: Adler, J.H. (eds) Capital Movements and Economic Development. *International Economic Association*

- Conference Volumes*. Palgrave Macmillan, London. [https://doi.org/10.1007/978-1-349-15238-4\\_9](https://doi.org/10.1007/978-1-349-15238-4_9)
- Cazachevici, A., Havranek, T., & Horvath, R. (2020). Remittances and economic growth: A meta-analysis. *World Development*, 134, Article 105021. <https://doi.org/10.1016/j.worlddev.2020.105021>
- Chowdhury, M. (2016). Financial Development, Remittances and Economic Growth: Evidence Using a Dynamic Panel Estimation. *Margin: The Journal of Applied Economic Research*, 10(1), 35–54. <https://doi.org/10.1177/0973801015612666>
- Dickey, D. A., & Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, 74(366a), 427–437. <https://doi.org/10.1080/01621459.1979.10482531>
- Dokas, I., Panagiotidis, M., Papadamou, S., & Spyromitros, E. (2023). Does innovation affect the impact of corruption on economic growth? International evidence. *Economic Analysis and Policy*, 77(C), 1030-1054. <https://doi.org/10.1016/j.eap.2022.12.032>
- Engle, R., & Granger, C. (1987). Cointegration and error correction: Representation, estimation and testing. *Econometrica*, 55(2), 251–276. <https://doi.org/10.2307/1913236>
- Elsadig, M., & Rahim, K. (2023). FDI inflows spillover effect implications on the Asian-Pacific labour productivity. *International Journal of Finance & Economics*, 28(1), 575-588. <https://doi.org/10.1002/ijfe.2437>. January
- Nkoro, E., & Uko, A. K. (2016). Autoregressive Distributed Lag (ARDL) Cointegration technique: Application and interpretation. *Journal of Statistical and Econometric Methods*, SCIENPRESS Ltd, 5(4), 1–3.
- Han, X., Khan, H., & Zhuang, J. (2014). Do Governance Indicators Explain Development Performance? A Cross-Country Analysis. *Asian Development Bank Economics Working Paper Series* No. 417. <http://dx.doi.org/10.2139/ssrn.2558894>.
- Hansen, B. E. (1999). Threshold effects in non-dynamic panels: Estimation, testing, and inference. *Journal of Econometrics*, 93(2), 345–368. [https://doi.org/10.1016/S0304-4076\(99\)00025-1](https://doi.org/10.1016/S0304-4076(99)00025-1).
- Islam, M. S. (2022). Do personal remittances influence economic growth in South Asia? A panel analysis. *Review of Development Economics*, 26(1), 242–258. <https://doi.org/10.1111/rode.12842>.
- Imai, K. S., Gaiha, R., Ali, A., & Kaicker, N. (2014). Remittances, growth, and poverty: NEW evidence from Asian countries. *Journal of Policy Modeling*, 36(3), 524-538. <https://doi.org/10.1016/j.jpolmod.2014.01.009>
- Johansen, S., & Juselius, K. (1990). Maximum Likelihood Estimation and Inference on Cointegration—With Applications to The Demand for Money. *Oxford bulletin of economics and statistics*, 52(2), 169–210. <https://doi.org/10.1111/j.1468-0084.1990.mp52002003.x>
- Jushi, E., Hysa, E., Cela, A., Panait, M., & Voica, M. C. (2021). Financing growth through remittances and foreign direct investment: Evidence from Balkan countries. *Journal of Risk and Financial Management*, 14(3), 117. <https://doi.org/10.3390/jrfm14030117>
- Matuzeviciute, K., & Butkus, M. (2016). Remittances, Development Level, and Long-Run Economic Growth. *Economies*, 4(28), 1–20. <https://doi.org/10.3390/economies4040028>.
- Tchekoumi, L. B., & Nya, P. D. (2023) Remittances and economic growth: What lessons for the CEMAC zone?, *Cogent Economics & Finance*, 11(1). <https://doi.org/10.1080/23322039.2023.2191448>.

- Menegaki, A. N. (2019). The ARDL Method in the Energy-Growth Nexus Field; Best Implementation Strategies. *Economies*, 7(4), 105.  
<https://doi.org/10.3390/economies7040105>
- Hadush, M., Gebregziabher, K. G., & Biruk, S. (2023). Determinants of economic growth in East African countries: A dynamic panel model approach. *Cogent Economics & Finance*, 11(2).  
<https://doi.org/10.1080/23322039.2023.2239629>
- Olayungbo, D. O., & Quadri, A. (2019). Remittances, financial development and economic growth in sub-Saharan African countries: evidence from a PMG-ARDL approach. *Financial Innovation*, 5(9). <https://doi.org/10.1186/s40854-019-0122-8>
- Oteng-Abayie, E., Awuni, P. A., & Adjei, T. K. (2020). The Impact of Inward remittances on Economic growth in Ghana. *African Journal of Economic Review*, 8(3), 49–65.  
<https://doi.org/10.22004/ag.econ.308775>.
- Peterson, E. W. F. (2017). The role of population in economic growth. *SAGE Open*, 7(4), 2158244017736094. <https://doi.org/10.1177/2158244017736094>
- Rehman, N. U., Hysa, E., & Poon, W. C. (2021). The effect of financial development and remittances on economic growth. *Cogent Economics & Finance*, 9(1).  
<https://doi.org/10.1080/23322039.2021.1932060>
- Sadiq, K., & Tsourapas, G. (2021). The Postcolonial Migration State, *European Journal of International Relations*, 27(3). <https://doi.org/10.1177/13540661211000114>
- Sutradhar, S. R. (2020). The impact of remittances on economic growth in Bangladesh, India, Pakistan, and Sri Lanka. *International Journal of Economic Policy Studies*, 14, 275–295.  
<https://doi.org/10.1007/s42495-020-00034-1>
- Sarker, B., & Khan, F. (2020). Nexus between foreign direct investment and economic growth in Bangladesh: an augmented autoregressive distributed lag bounds testing approach. *Financial Innovation*, 6(10). <https://doi.org/10.1186/s40854-019-0164-y>
- Sobiech, I. (2015). Remittances, finance and growth: Does financial development foster remittances and their impact on economic growth?. *FIW Working Paper Series*, 158.  
<https://hdl.handle.net/10419/121159>
- DESA, U. N. (2020). The International Migration report (Highlights). *Department of Economic and Social Affairs*.
- Ustarz, Y., & Issahaku, H. (2017). International Migrant Remittance and Productivity Growth in Ghana. *Ghana Journal of Development Studies*, 14(2), 63–82.  
<https://doi.org/10.4314/gjds.v14i2.4>
- Yavuz, R. I., & Bahadir, B. (2022). Remittances, ethnic diversity, and entrepreneurship in developing countries. *Small Business Economics*, 58, 1931–1952.  
<https://doi.org/10.1007/s11187-021-00490-9>
- Zohry, A. (2013). Egypt's International Migration after the Revolution: Is There Any Change?. *Confluences Méditerranée*, 87, 47-54. <https://doi.org/10.3917/come.087.0047>.