Asian Economic and Financial Review
ISSN(e): 2222-6737
ISSN(p): 2305-2147
DOI: 10.55493/5002.v16i2.5904
Vol. 16, No. 2, 38-55.

URL: www.aessweb.com

How does cost of remitting influence bilateral remittances from GCC to South and Southeast Asia?

Hajer Kratou[1+]
Gyanendra Singh Sisodia[2]
Hemant Kumar Sah[3]
Alberto Ibanez[4]

[1,2]*College of Business Administration, Ajman University, Ajman, United Arab Emirates.*
[1]*Email: h.kratou@ajman.ac.ae*
[2]*Email: singh_gis@yahoo.co.in*
[3]*Alliance School of Economics, Alliance University, Bengaluru, India.*
[3]*Email: hemantsah752@gmail.com*
[4]*College of Business Administration, Universidad Ecotec, Km. 13.5, Samborondon, EC092302, Samborondon, Ecuador.*
[4]*Email: albertoif@yahoo.es*


(+ Corresponding author)

Article History
Received: 17 October 2025
Revised: 12 January 2026
Accepted: 28 January 2026
Published: 26 February 2026

Keywords
Fixed effect model
Instrumental variable technique
Remittances
South and South East Asia countries
Sustainable development program
Transfer cost.

JEL Classification:
F24; O10; D60.

ABSTRACT

The United Nations (UN) development program sets a target to minimize the fees of sending money home to a level of 3% of the remitted amount. This study investigates the determinants of bilateral remittances from GCC to South and East Asia, with an emphasis on the cost of remitting. We use thirteen years of data covering 2010 to 2022. We applied panel data techniques such as the fixed effect model. We further cope with endogeneity using the instrumental variable (IV) technique. We use World Bank data for the variables of interest (bilateral remittances and the price of remittances). The findings show that a decrease in remittance costs by 10% significantly improves bilateral remittances in the studied corridors. It implies that cost is a key factor influencing the remittance amount for a country. This study shows that local currency depreciation against the US dollar results in higher transactions of remittances in local currency. Important and practical implications for policymakers suggest that cost reduction policies help to remit higher amounts for destination countries and increase the role of banks in the market. The novelty of this study lies in the significance of remittance flows in the GCC-South and East Asia corridors.

Contribution/ Originality: The contribution of this study to the existing literature sheds light on the determinants of bilateral remittances from GCC states to South and East Asian economies. It offers new insights into the role that the cost of remitting plays in increasing the volume of remittance flows in the studied corridors and raises policymakers' attention to this development policy.

1. INTRODUCTION

Remittance is generally known as a fund sent by migrants in order to sustain their families residing at home (Mack et al., 2023). Inward remittances significantly contribute to the country's economic growth, mainly through immigrants working abroad (Meyer & Shera, 2017). The key determinants of migrants are skill composition. In this vein, Adams (2009) argues that countries that export a high proportion of low-skilled workers compared to high-skilled ones receive a relatively high amount of remittances. Remittances could substitute for credit and help fund investment in less financially developed countries (Giuliano & Ruiz-Arranz, 2009) and can alleviate credit constraints. There are incentives for migration decisions, such as a lack of security, safety, and political freedom. Migration enables individuals to obtain a better and safer life. Furthermore, migrants transfer part of their earnings to their families in the origin country (Yoshino, Taghizadeh-Hesary, & Otsuka, 2020). Additionally, the source country's (home country)

macroeconomic, financial, and political factors have key impacts on the flow of remittances (Abbas, Masood, & Sakhawat, 2017). Moreover, relative stability, counter-cyclicality, and lower risk make it unique in terms of the size and importance of remitted amounts (Ratha & Kang, 2020).

1.1. Causes/Factor of Remittances

As remittance inflows are a key resource for developing and middle-income countries, they depend on multiple factors. Lower economic levels attract large amounts of remittance inflows to support economic growth (Yoshino et al., 2020). The motives behind remittances are altruism (care about families' well-being at home) and self-interest (Lim & Morshed, 2015). The economic factors can be classified into three categories: self-altruism, self-interest, and enlightened self-interest (Chami et al., 2008; Lucas & Stark, 1985; Ratha & Kang, 2020). Economic conditions in host and home countries, demographic characteristics, and investment opportunities also influence money inflow. Factors such as income, financial conditions, and domestic institutions determine migrants' remittances (Tabit & Moussir, 2016). Wealthier countries generate more remittances for the host country. In this situation, well-functioning domestic institutions may have the capacity to utilize remittances to accelerate economic development. Host countries are primarily labor-exporting nations that receive regular remittances and can further utilize these funds to create an investment-friendly environment.

Inflation, income per capita, and exchange rate are key macroeconomic determinants of remittances in receiving countries (Panda & Trivedi, 2015). Additionally, inflation control mechanisms further seem to smooth remittance inflows through exchange markets. Moreover, flow assists in financing trade deficits. "Remittances constitute the second-largest source of external funding behind foreign direct investment for developing countries (Buch & Kuckulenz, 2010). Unlike traditional macroeconomic variables, the magnitude of remittances represents private and official capital flows driven by market factors and social decisions to remit.

1.2. Role of Remittances

The vitality of remittances can be seen in the improvement of democratic institutions through investment in education and poverty reduction measures (Williams, 2017). The uses of remittances depend on how households perceive them. Remittances are considered transitory and compensatory income (Narayan, Narayan, & Mishra, 2011; Randazzo & Piracha, 2019). Transitory income spent on investment purposes, such as the promotion of capital (human and physical), influences long-term growth and development. Moreover, compensatory income spent on consumption purposes helps accelerate domestic production and indirectly affects inflation. Remittances are considered another source of income, apart from being indifferent in household expenditure behavior. In the short run, remittances improve the financial sector in developing countries. Further, they are used to access formal financial services primarily for transactions and payments in the long run (induced financial literacy hypothesis) (Fromentin, 2017). Taghavi (2012) claims "remittances generate several positive contributions to economic development of the recipient countries by reducing poverty, as well as increasing aggregate investment and promoting growth". In addition, remittance carries with the prospects to reduce income inequality and poverty substantially (Bang, Mitra, & Wunnava, 2016). Spending on education rather than saving and creating human capital further boosts the incentive to invest in the economy, and finally, it helps to add capital to the economy (Benhamou & Cassin, 2021). The flow of remittances differs in the world. The major share (around 90%) comes from five regions of the world, where North America (35%) and Western Europe (31%) account for higher amounts (Orozco & Ellis, 2014). Additionally, African countries receive mostly from Western Europe, and Latin America receives mostly from North America (primarily the United States), respectively.

The gap this study fills is related to (first) the shortage of multi-country research emphasizing bilateral remittances in the corridor of the GCC to South and Southeast Asia. Most existing studies explore single studies, such as Tumbe (2012) on bilateral remittances from the EU to India. Jiménez-Gómez and Flores-Márquez (2023) on

bilateral remittances from the US to Mexico. Kakhkharov, Akimov, and Rohde (2017) explore the bilateral remittances from Russia to post-Soviet economies. Mallela, Singh, and Srivastava (2020) studied the group of top-five remittances receivers using bilateral remittances data. Second, we further emphasize the particular cost of remitting by exploring the World Bank's "Remittances Price Worldwide" database, which is a relatively novel resource that calculates the cost of remitting for each corridor, specifically, one GCC state as the sender to one South or Southeast Asian receiver. Third, another novelty of this study is that remittances represent a significant portion for South and Southeast Asian countries, which has led to increased migration toward the GCC in recent years. The remitted amount acts as a catalyst for economic prosperity, further developing the financial sector and human capital both within and outside the economy.

The structure of our paper follows the plan: Section 2 highlights relevant literature; Section 3 focuses on the research methodology, including data and econometric models. Instrumental Variable (IV) estimation techniques are explored to address potential endogeneity issues such as measurement error of remittances, reverse causality between remittances and the cost of remitting, and omitted variable bias. Section 4 presents results and discussion, while section 5 provides the conclusion and key recommendations.

2. LITERATURE REVIEW

To address the research question, a variety of theories and literature are navigated. First, several studies focus on micro and macro literature that investigate the influence of remittances on both sending and receiving economies. Here, we emphasize the macroeconomic effect of remittances on recipient economies. On one side, few literatures have contributed to revealing the positive effect of remittances. For example, many literatures align with the hypothesis that remittances are a stimulus for economic growth, although some recognize that there are two opposite effects, depending on the time frame and conditioned by financial and institutional conditions.

While others argue that there is no definitive consensus on that matter among empirical studies (Cazachevici, Havranek, & Horvath, 2020). The positive impact that emerges from the literature aligns with the hypothesis that remittances serve as a prospective source of income and financing of expansion activities at home. In this regard, many studies claim the countercyclical behavior of remittances. Umair and Waheed (2017) and Kratou and Yogo (2023) explore that remittances behave in a countercyclical way and work as a protective shield during economic downturn and financial crisis to protect families who were left behind. This strand of literature is connected with the altruistic theory, which was first identified by Lucas and Stark (1985). Study highlights that remittances are an altruistic transfer of money to help family members back home. In the same vein, Ajzen (1991) latter, develop a model of "planned behaviour" which classifies two behaviours, one expectation and the other as a "normative reaction of others". Both explain the altruistic behaviour of the remitters.

On the other hand, there is also a strand of literature that potentially explores the jeopardizing effect of remittances on recipient economies. One of these effects is related to financing war and terrorist events. In this regard, Mascarenhas and Sandler (2014), in their panel study covering 142 countries' data set, advocate that remittances work as a catalyst for terror incidents. The finding highlighted that remittances affect terrorist attacks positively and significantly terrorist attacks (Eloohi Nazari, Amiri, & Biniaz, 2022). In line with this, Elu and Price (2012) study on Sub-Saharan Africa argue that the linkage of terror incidents with remittances accounts for every $250,000 to 1 million to the remitting family's country. Additionally, Crisman-Cox and Park (2023) in their study argue that an increase in remittances of 100 USD/ person leads to a domestic terrorist attack (approximately 2.5). To go ahead with the literature, Acosta, Lartey, and Mandelman (2009) highlight the "Dutch disease" effect along with the reduction of labour supply and damage to the reputation of external competitiveness.

In another literature and theory debate, there are emerging studies that emphasize the cost of remitting to address determinants of remittances and explore the reverse causality as a source of endogeneity between remittances and the cost of remitting. Here, we refer to behavioral theory that explains the changes in remitting cost and

remittance behavior within a framework. For a more detailed discussion on this, Ajzen (1991) established the planned behaviour model, which examines the factors that act as facilitators or barriers. This may explain changes in remitter behaviour due to cost variations. In this context, we can proceed with studies that analyze the elasticity of remittance costs. Freund and Spatafora (2008) is among the first studies covering a sample of 104 countries. Their findings reveal two facts: first, higher transaction costs discourage migrants from remitting amounts. Second, migrants choose informal channels to send remittances, as their transaction costs are lower than those of official channels. A study covering 1,680 migrants in the Netherlands (Kosse & Vermeulen, 2014) shows that remittance costs are a significant driver. Ahmed and Martínez-Zarzoso (2016) claim that Pakistani migrants avoid expensive remitting means and might use informal channels to remit money. In the case of Russia and post-Soviet countries, Kakhkharov et al. (2017) in their study explored that transaction costs and currency depreciation of host countries are key determinants influencing the increase in remittance amounts. The formal remittance amount is significantly predicted by transaction costs, which are crucial for remittance-receiving countries. The level of transaction costs serves as an important factor in formal remittance transfers. Ferriani and Oddo (2019) reveal that lower remittance costs motivate migrants to use formal channels over informal ones in Italy.

The above literature highlights that remittance has a visible impact on economic, social, and financial grounds. Although the effect of remittances is conditional, it is determined by a country's financial institutions, which play a key role in remitting the amount. Moreover, the use of remittances is detrimental to humanity and promotes illegal and terrorist activities, as highlighted in some studies, but it also has positive impacts that support banking services. Additionally, cost criteria are a key consideration in remitting the amount, along with involved time. Consequently, cost considerations in remittance behavior (with reference to the planned behavior theory by Ajzen (1991)) and transfer become key to this study.

Nevertheless, most existing studies have emphasized single aspects, with less attention given to regional studies. In this paper, we explore the determinants of bilateral remittances from GCC states to South and Southeast Asian countries, focusing specifically on the role of remittance costs.

3. RESEARCH METHODOLOGY

3.1. Overview of Remittances within South and Southeast Asia

Our analysis uses bilateral data on remittances that determine the flow of remittance amounts from GCC countries to South and Southeast Asian countries. Few countries are among the world's leaders with higher remittances to GDP ratios (Kakhkharov et al., 2017), and Nepal is among the top recipients, with an average of 27% of GDP.

Regrouping two groups of regions in this analysis is justified by the fact that these countries have somewhat similar migration trajectories to the GCC. First, this strongly depends on the workforce coming from the two sub-regions. Consequently, the determining factors and patterns of remittances in South and South-East Asia could be hypothesized to differ slightly. Second, GCC countries still serve as the key source of remittance flows for these countries (Table A). More precisely, GCC regions are the primary source of remittances for Bangladesh (US$9,338 million); India (US$50,299 million); Indonesia (US$5,924 million); Nepal (US$3,632 million); Pakistan (US$15,000 million); and Sri Lanka (US$3,521 million). A quick review of World Bank (2019) (https://www.worldbank.org/en/topic/migration/brief/remittances-knomad) data on bilateral remittances reveals that the proportion of remittances from GCC significantly outstripping 45% of total remittances inflows received by these countries.

Table A. Proportion of remittances from GCC countries and relative to GDP for the South and South-East Asia in 2019.

Country	Total remittances (US$ million)	Remittances from GCC (US$ million)	Proportion of remittances from GCC (%)	Remittances to GDP ratio (%)
Bangladesh	18,348	9,338	51	6.0
India	83,131	50,299	61	2.8
Indonesia	11,667	5,924	51	1.04
Nepal	8,127	3,632	45	26.52
Pakistan	22,506	15,004	67	8.08
Philippines	35,167	9,911	28	9.33
Sri Lanka	6,747	3,521	52	8.0

Source: World Bank (2019) remittances (total and bilateral from GCC countries).

However, for the Philippines, the United States is considered the principal sender, with US $13,654 million, and GCC countries are the second in terms of remittance provision.

Figure 1 illustrates that Remittances flow from GCC to South and South-East Asia are sensitive to variations in economic conditions in the GCC region. While the sharpest decline in oil prices (by about 48 percent) in 2017 impacted GCC GDP growth, the effect was channeled to South and East Asia. Consequently, a significant decline was observed in remittance inflows, albeit temporarily, in South and East Asia, but they bounced back despite the slowdown in GCC economies. A projection shows that during the COVID-19 pandemic and the decline in oil prices, global remittances experienced a sharp decrease of 20 percent, and the decline in global oil demand led to a reduction of about 4 percent in remittance inflows in South and East Asia (Knomad and World Bank, 2019). Flows to Bangladesh and Pakistan increased during COVID-19 compared to the pre-COVID period. This is due to policy measures taken by these governments to reduce remittance costs. For instance, the cost of remitting to Bangladesh dropped by 12% and 18% for amounts equivalent to US$200 and US$500 during the pandemic.

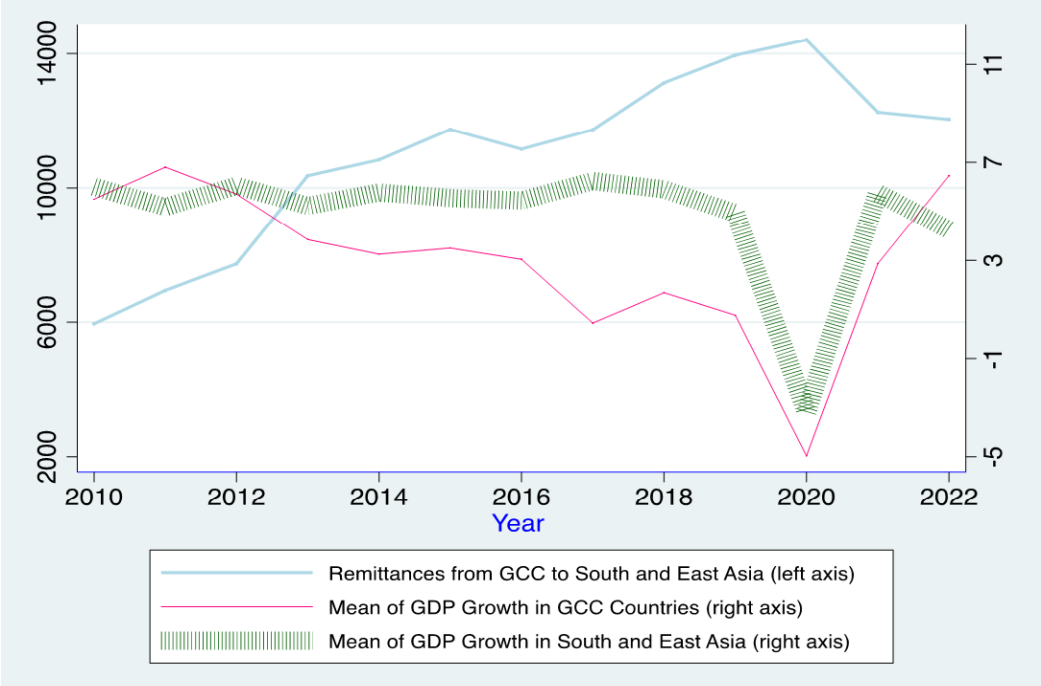

Figure 1. Remittances from GCC, GDP growth in GCC, and GDP growth in South and East Asia 2010-2022.

There is also some exclusivity in remittance service providers from GCC to South and Southeast Asia. Banks and Money Transfer Operators (MTOs) are the providers of this service. Unlike other international corridors, post offices are excluded from these corridors. Fig.3 shows that remittance services from GCC to Indonesia are exclusively carried out by MTOs, which explains the high cost of remitting in this country. A high demand for these service providers

is the main reason for relatively more expensive service fees in Indonesia compared to other countries in the region. Similar observations were found for the Post-Soviet economies and show that demand for transfer through MTOs results in higher fees (Kakhkharov et al., 2017). Further, the cost of remitting by bank tends to be relatively higher than MTOs to other countries in our sample, except Sri Lanka, as claimed by the literature (Beck, Janfils, & Kpodar, 2022; Kpodar & Imam, 2024) that service related to clients remit amounts are the most considerable factor than the higher regulatory cost of banks and remittances service.

Figure 2 exhibits a negative correlation between the cost of remitting an amount equivalent to 200 USD and the amount of remittances. A 1% increase in remittance cost results in a 16.93% decrease in the average remitted amount, as shown in Figure 2. It can be inferred that an increase in remittance costs reduces the amount received in the home country. For low-income countries like those in the study, remitters continue to remit, but rising costs lead to smaller remittance amounts, as seen in Indonesia (IDN). This aligns with Kratou and Khlass (2023). Remittances serve as a critical lifeline support during the crisis for extremely low-income people (World Bank Press Release, 12 May 2021, 1)[1]. Altogether, the above findings lead to relevant predictions and support the theoretical framework. However, the association between remittance and the cost of remitting will be more supportive if we use other determining factors of income inequality with an empirical data set.

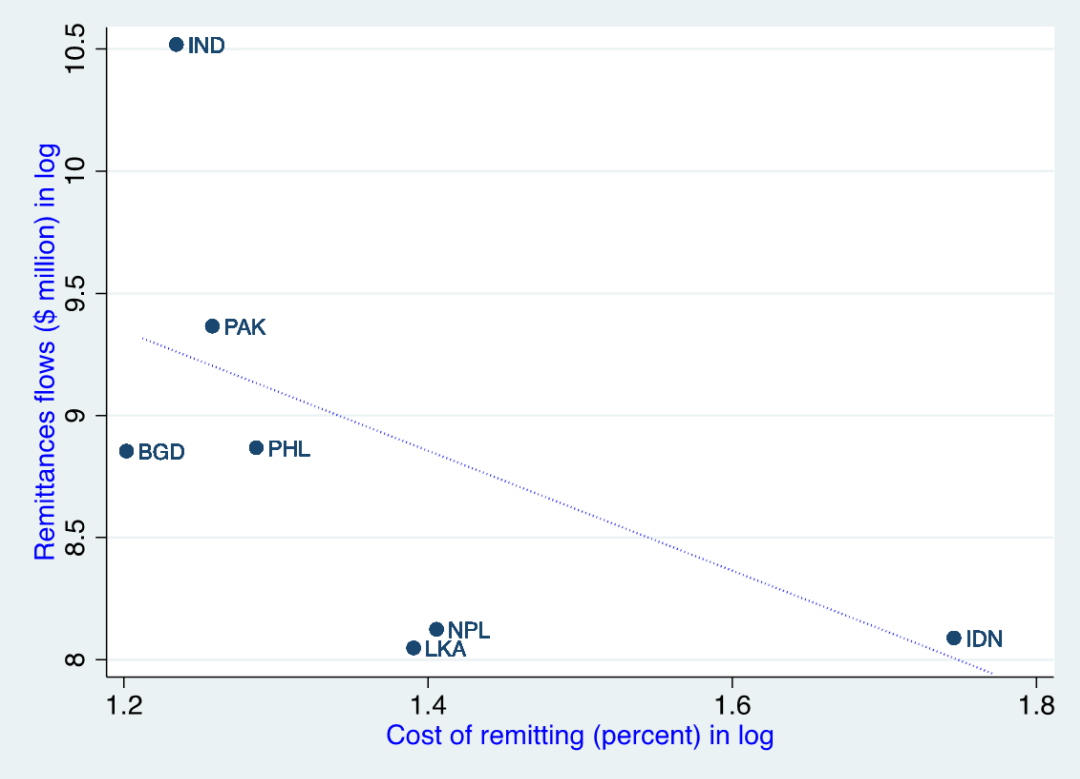

Figure 2. Average bilateral remittances flows and average cost of remitting of 200 $US.

3.2. Data

To investigate the determinants of remittances, this paper uses a panel data analysis covering 7 countries (refer Table 4 in Appendix 1) from the South and South -East Asia regions over 13 years period from 2010 to 2022. The remittances series explored in this study uses bilateral data and is provided by the World Bank and KNOMAD (The

[1] World Bank Press Release, 12 May 2021, 1), https://www.worldbank.org/en/news/press-release/2021/05/12/defying-predictions-remittance-flows-remain-strong-during-covid-19-crisis

Global Knowledge Partnership on Migration and Development) (https://www.knomad.org/). For this study, for a given remittance-receiving country, the number of remittances is calculated as the sum of the six amounts of remittance flows from the six GCC countries (refer Table 4 in Appendix 1). As reported in the literature (Freund & Spatafora, 2008; Mallela et al., 2020), data on bilateral remittances show a problem of scarcity in developing countries because of a lack of formal channels to remit money. Consequently, most central banks report inaccurate data on bilateral remittances. The database used in this paper recognizes this problem: "There are gaps in the data and concerns about its quality".

Data on the cost of remitting were extracted from Remittance Prices Worldwide (RPW) (https://remittanceprices.worldbank.org/) data source. Data are the percentage fees for remitting amounts equal to US $200 and US $500. This data is only provided every quarter. We then calculate the yearly average for each corridor, and lastly, for a given remittance-receiving country, the cost of remitting is calculated as the mean of the cost of remitting from the six GCC countries. This database covers corridors (367 countries) and includes remittance senders (48 countries) and receivers (105 countries), respectively.

However, this database only covers formal remittance transfers through money transfer operators, post offices, and banks, and ignores informal financial channels, i.e., the Hundi network. The latter operates through a large network of money brokers that are relatively less expensive (less than 2% of the remitted amount) than formal channels (Raza, 2020). Furthermore, it ensures money transfer for developing countries, including South and Southeast Asia. However, in this study, we are unable to use this database because the financial system operates in a traditional way, where transaction amounts and transfer fees are not tracked. While this study focuses on remittances and their fees to test the hypothesis that emphasizes using recorded data, we also recognize the problem of measurement error and the accuracy of bilateral remittances, which could be a potential source of endogeneity, as discussed in detail in the next section. We address this by using the instrumental variable technique.

We control for a set of economic and demographic variables in both remittance-sending and receiving countries of the migrant, which serve as vital determinants of bilateral remittances. We initially control for the development level, captured by both income (gauged by GDP per capita) in the home and host countries of the migrants. For a given remittance-receiving country, the per capita income of the remittance-sending country is calculated as the average of the income per capita of the six GCC economies. We also control for the business environment in the host country using the real interest rate. Additionally, we account for macroeconomic instability in the remittance-sending and receiving countries by using the foreign exchange rate in the home (measured as local currency units relative to the U.S. dollar) and controlling for inflation (using the GDP deflator) in the host country. Literature reports that the depreciation of the domestic currency encourages remitting funds (Kakhkharov et al., 2017). Following Kpodar and Imam (2024), we control the number of migrants originating from remittance-accepting countries. We also control for the total population size, as it gauges the relative volume of remittances in the beneficiary economies. We control for demographic variables, such as age dependency (used by Buch and Kuckulenz (2010)). Further, the sample period witnessed several shocks. For instance, the recent pandemic had a negative consequence on business activities in the GCC economies, which in turn decimated migrants' earnings. We therefore control for the economic cycle, such as the COVID-19 pandemic. The latter has similar effects to an economic crisis and, as a force majeure, is likely to affect migration and remittances. These data are obtained from the World Development Bank (The World Bank). The definition of each variable and source is presented in Table A (appendix). Also, descriptive statistics and correlation analysis are shown in Table 1 and Table 2, respectively.

Table 1. Descriptive statistics.

Variables	Mean	Standard deviation	Minimum	Maximum
Bilateral Remittance Volumes	8.83	0.94	6.74	10.82
Remittances (%GDP)	1.73	0.96	-0.28	3.31
Remittances per Migrant	0.97	0.66	0.00	2.00
Cost of remitting the equivalent of US$200 (log)	1.36	0.23	0.911	2.14
Cost of remitting the equivalent of US$500 (log)	0.86	0.24	0.057	1.55
GDP per Capita Home	8.73	0.45	7.89	9.52
GDP per Capita Host	10.97	0.03	10.90	11.00
Interest rate Host	2.63	13.14	-14.90	31.48
Foreign ER Home	1858	4422	42.22	14849
Migrant Population	9.44	2.86	6.49	15.09
Age – Dependency	4.01	0.125	3.85	4.27
Total Population	18.70	1.30	16.84	21.07
Economic Crisis	0.07	0.26	0	1
Inflation (Host)	2.45	0.44	1.57	2.88

Table 2. Correlation analysis.

Variables	1	2	3	4	5	6	7	8	9	10	11	12
Bilateral Remittance Volumes	1.00											
Cost of remitting the equivalent of US$200 (log).	-0.52*	1.00										
Cost of remitting the equivalent of US$500 (log).	-0.46*	0.91*	1.00									
GDP per Capita Home	-0.17	0.27*	0.13	1.00								
GDP per Capita Host	-0.18	0.17	0.23*	-0.17	1.00							
Interest rate Host	0.13	0.02	0.01	-0.01	-0.10	1.00						
Foreign ER Home	-0.27*	0.57*	0.37*	0.47*	-0.04	0.01	1.00					
Migrant Population	0.25*	-0.25*	-0.27*	0.06	-0.46*	-0.20	0.01	1.00				
Age – Dependency	-0.02	-0.21*	-0.16	-0.59*	0.17	0.01	-0.42*	-0.13	1.00			
Total Population	0.73*	-0.11	-0.12	-0.08	-0.01	-0.00	0.20	0.18	-0.19	1.00		
Economic Crisis	0.09	-0.03	-0.06	0.06	-0.66*	0.39*	0.02	0.51*	-0.06	0.01	1.00	
Inflation (Host)	0.01	-0.16	-0.18	0.07	-0.21	-0.87*	0.02	0.55*	-0.08	0.01	0.01	1.00

Note: (*) indicates the statistical significance.

3.3. Econometric Model

The model equation consists of regressing remittances inflows on a set of macroeconomic and demographic variables.

$$Bilateral\ Remittances_{it} = \beta_1 Cost\_Remitting_{it} + \beta_2 \text{Controls}_{it} + \alpha_i + \gamma_t + \varepsilon_{it} \quad (1)$$

$Remittances$ represents the total bilateral remittances received annually by country i (from the six GCC countries) during the period t in current US dollars, per migrant, and as a percentage of its GDP. $Cost\_Remitting$ represents the cost of remitting, the equivalent of US $200 and US $500 to each of the country i of the sample over period t. X is a vector of the explanatory variables, i.e., the economic/demographic weights, for country i at Time t. α_i and γ_t reflects the country and Time fixed effects, and $\mathcal{E}$ is the error term.

To estimate Eq.1, we apply a two-way Fixed Effect (FE) procedure in panel data to explore and adjust unobserved disturbances for country-specific and time-specific factors simultaneously. This technique helps examine effects over time within countries and controls for variation between countries (Imai & Kim, 2019).

In the second stage of our analysis, we follow Ajefu and Ogebe (2021) to address potential endogeneity, specifically reverse causality, using the instrumental variable (IV) technique. There are three roots of this econometric problem: reverse causality, measurement error, and omitted variables. On one side, the literature has documented the

"altruism effect" of remittances, with Ajzen (1991) developing a model of "planned behaviour". This examines the involved factors that play a crucial role either as a facilitator or impeder. This significantly explains the change in remitter behavior due to a change in remitting cost. A higher transaction cost discourages migrants from sending money home or choosing another channel to remit (mostly unrecorded channels through friends). On the other hand, an increase in bilateral remittances tends to minimize the cost of remitting in this corridor. For instance, the cost of sending the equivalent of 500 US$ is less than that of the equivalent of 200 US$ (according to data from the Remittances Worldwide data source). A second potential source of endogeneity is related to measurement errors in real remittances data. We recognize in this study that there are other channels of remitting money classified as unrecorded, for which statistics are not available. A third source of endogeneity stems from our model, which doesn't capture all potential shocks that might influence the studied relationship.

We refer to empirical literature on remittances and explore two external instrumental variables to mitigate reverse causality between remittances and remitting costs, as well as measurement errors of remittances, largely discussed in the literature.

The use of instrumental variables signifies that it should have a correlation with the endogenous explanatory variable and act only on the dependent variable (i.e., remittances). In the context of this study, we follow Altonji and Card (2018), Card (2001), and Ahmed, Mughal, and Martínez-Zarzoso (2021) in the instrumentation choice. One of the instruments is the number of money transfer suppliers. In our sample and according to remittance prices worldwide, there are two types of suppliers (firms) located in the GCC states and supplying money transfer services to South and East Asian states (covered in our sample), namely banks and Money Transfer Operators (MTOs). On one side, in the remittance transfer market, MTOs' service points reflect the competition level between MTOs, providing a suitable estimation instrument (Kakhkharov et al., 2017). They also argue that the expected positive correlation between MTO and remittances does not always hold and refer to Orozco and Ellis (2014) study on Latin America. On the other hand, Kakhkharov et al. (2017) claim that most of the bank branches focus on convenience for labor migrant families (principal beneficiaries) and later increase demand for transfers through MTOs, which possibly results in fee hikes. The second potential instrument used in this study reflects the speed of the financial transfer. This is a vital factor migrants consider when choosing a remitting channel. Ferriani and Oddo (2019) claim that if the transaction process is long, migrants would attempt to use alternative channels to remit money home. Ahmed et al. (2021) state that remittance channels depend on accessibility and speed, and mention that the latter is often positively correlated with transfer fees. According to the Remittances Price Worldwide platform, transfer speed has been categorized into six broad categories: less than one hour, same-day, next day, two days, three to five days, and six days or more. For this study, a high (low) score is assigned to the speediest (slowest) service.

The three suggested instruments do not risk violating the exclusion restriction by capturing common shocks. The validity was assessed using tests, including the Kleibergen-Paap under-identification test, where the null hypothesis states that the instruments have insufficient explanatory power to predict the endogenous variable(s) for parameter identification (Windmeijer, 2024). Additionally, the Weak identification test (Cragg-Donald Wald F statistic) was used, and the Hansen (1982)to test the overidentification. The null hypothesis states that no correlation exists between the instrument and the error term.

4. RESULT AND DISCUSSION

The estimated results of the two-way FE technique are presented in Table 1 (Appendix 1), examining three variables: (a) bilateral remittance in current US dollars; (b) remittances to GDP ratios; and (c) remittances per migrant. The interpretation of the coefficients is consistent, indicating that the remittance variables are statistically significant and persistent across different specifications, regardless of the remittance measure used. A 10 percent reduction in the cost of remitting results in an increase of 4.6 to 5.9 percent in the value of bilateral remittances sent from GCC states to South and Southeast Asia. It also leads to a 2.7 percent increase in remittances as a percentage of

GDP and an 11.6 percent rise in remittances sent by migrants (columns 1 to 10). This elasticity is halved when using remittances to GDP as the dependent variable (column 9). Conversely, the elasticity doubles when considering remittances per migrant as the dependent variable (column 10), most likely reflecting that rising remittance costs reduce the remitted amount more than the number of remittances from GCC states to the seven South and East Asian countries covered in this study. This result aligns with Kratou and Khlass' (2023) findings that remitters continue to remit at a certain level, and it became less when remitting costs increase in low-income countries. Results obtained from estimating regression using a transaction cost of US$500 (instead of US$200) show that the coefficients are slightly different. A 10 percent reduction in the cost of remitting the equivalent of US$500 leads to an increase in the value of remitting by 3.5 percent (less sizeable compared to previous results). This result has been previously tested by Ahmed et al. (2021), claiming that remitters of small amounts (assumed to be the equivalent of US$200) are highly sensitive to changes in the cost of remitting compared to those remitting relatively higher amounts (US$500).

Results from controls reveal that a 10 percent increase in the income per capita variable in the migrant home country leads to a 30 percent increase in bilateral remittances per migrant from the GCC states to South and Southeast Asia. This finding corroborates with Kpodar and Imam (2024) and Ahmed et al. (2021), arguing that remittances are driven by investment incentives. However, it contradicts the hypothesis that remittances compensate for negative income shocks and serve as consumption smoothing, as was the case in Turkey during 1964-1993 (Aydas, Metin-Ozcan, & Neyapti, 2005).

As expected, the exchange rate coefficient in the beneficiary country is positive and statistically significant with remittances, reflecting that a 10 percent depreciation of the home (local) currency against the US dollar tends to a 14.9 percent increase in remittances (as a percent of GDP). This support with Mandelman and Vilán (2020) observation that a strengthening of the US dollar motivates Mexican migrants to remit more money home. However, coefficients associated with total population and migrant population (the supply side of remittances) are, as expected, positive but lack statistical significance. This aligns with Ismail's (2020) findings, revealing that the migrants' network effect does not significantly impact remittances. Intuitively, an economic crisis is associated with a negative and significant coefficient. Economic slack in GCC states, due to the COVID-19 pandemic, is a force majeure circumstance negatively affecting migrants and their ability to remit. This result aligns with those of Kakhkharov et al. (2017). The coefficient associated with inflation in the migrant's host country is negative and significant. A high price level may reflect a high cost of living, which reduces the migrant's capacity to remit. This aligns with Katseli and Glytsos (1989), who argue that migrants remit later to avoid the inflationary effect.

Next, we estimate the relationship using the instrumental variable technique in order to control for the endogeneity issue. We present results in Tables 2 and 3 (first and second stage results, respectively) (Appendix 1). Since the study uses bilateral remittances rather than remittances to GDP or remittances per migrant, the IV would emphasize the bilateral value of remittances. The first-stage result in Table 2 shows that the two external instruments are positive and statistically significant at 1 and 5 percent for predicting the cost of remitting, making them appropriate for application in the second-stage model (Table 3).

One would expect that the increase in money transfer suppliers (banks and MTOs) would reflect a more efficient and competitive financial system. This should be concretized with a negative correlation between money transfer suppliers and the cost of remitting. However, our results show the opposite. The money transfer supplier is associated with a coefficient that is positive and highly significant, reflecting a positive correlation with the cost of remitting. To explain this result, we first refer to our sample data, which reveals that banks, as money transfer suppliers, charge relatively higher fees than other suppliers (Figure 3). Second, we refer to Kakhkharov et al. (2017), who argue about the role of bank branches and MTOs in remittance transfer activities.

As expected, results from the second instrument show that a 10 percent increase in transaction speed leads to a 51.4 percent increase in the cost of remitting, with significance at 5 percent. The speed of transaction reflects a prestation service and puts upward pressure on the service's cost. This aligns with previous empirical studies that

used this instrument. "Speed is often positively associated with transfer charges" Ahmed et al., 2021. Results related to the internal instrument (cost of remitting lagged by one year) show a significant and positive coefficient, indicating that past cost of remitting data strongly predict current costs, especially if the cost is relatively high in some corridors.

The validity of these instruments was confirmed using a set of tests, including first-stage statistics such as the F-statistic, which reveal (as shown in Table 2) a value above the rule of thumb (equal to 10). The Kleibergen-Paap under-identification test rejects the null hypothesis that the model is under-identified in all model specifications. The Hansen test of over-identifying restrictions cannot reject the null in different specifications. This further suggests that these instruments can influence the endogenous variable (cost of remitting) without necessarily being correlated with the unobserved factors affecting the dependent variable.

On the whole, results from the first-stage regression show that instruments are appropriate and could be applied in the second stage. Results associated with the second stage reveal that the coefficient related to the cost of remitting (the equivalent of US$200) is negative and statistically significant at 1 and 10 percent. The magnitude of the coefficient has increased compared to the previous one obtained by the fixed effects technique. A 10 percent decrease in the cost of remitting leads to an approximately 14 percent improvement in bilateral remittance volume (columns 1, Table 2). The elasticity of transaction cost has nearly tripled relative to the estimate from the FE technique, indicating that the previous method underestimated the coefficients. This result is obtained when addressing the endogeneity of the remittance cost using two external instruments: transfer speed and money transfer providers. Tests for weak and under-identification show that the instruments are not weak. Additionally, the exclusion restriction test confirms that the instruments are valid. Results from using the cost of remitting of a US$ 500 (Column 5, Table 2) reveal a negative coefficient. Nevertheless, the coefficient is weak at the 10 percent significance level. On one side, the negative coefficient reflects the fact that the cost of remitting remains a constraint for migrant workers who are relatively sensitive to changes in the cost of remitting and are used to sending a relatively small amount (the equivalent of US$200). On the other hand, the loss of significance indicates that migrants who send a relatively large amount (the equivalent of US$500) are less sensitive to the cost of remitting. This finding could be explained by the fact that these transfers (relatively large) are infrequent and carried out by non-temporary migrants or for investment purposes, which explains why these transfers are less sensitive to changes in the cost of remitting. Contrary to temporary migrants, non-temporary migrants are more sensitive to any increase in the cost of remitting because they remit smaller amounts and do so more frequently compared to better-paid ones. This aligns with Kratou and Khlass' (2023) findings, which argue that the low -income countries' remitters are temporary immigrants who send small amount for money primarily for altruistic purposes. Our results corroborate with Ahmed et al. (2021) study, who argue that the cost of remitting seems not to be a constraint for large amounts and explain that exorbitant bank transfer fees may be burdensome for low-income migrant workers.

Results of the control variables align with the previous estimation technique and reveal that the coefficient associated with per capita income in the migrant host country is negative and highly significant, while it is around zero, contradicting the findings of Kpodar and Imam (2024) on a sample covering 71 countries. The coefficient associated with age dependency reveals that a 10 percent increase induces an increase of 0.28 percent in remittance value.

This corroborates with Adams (2009), who claims that a large number of non- working population depends on household income, and this behaviour incentivized the remittances transfer. The total population in the migrants' home country and remittance is positively and significantly associated. The different specifications study aligns with Kpodar and Imam (2024), who argue that this variable reflects the demand side of remittances. The other control results are in coherence with the previous results.

Both techniques reveal similar results, except that the IV technique shows a more sizeable coefficient of the variable of interest, "cost of remitting."

5. CONCLUSION

To the best of our knowledge, this is among the very few studies that endeavor to test bilateral remittances from GCC states to a sample including South and South-East Asia. We apply panel data techniques over 13 years from 2010 to 2022. The findings from the fixed effect model highlight that variables are significant. There is an improvement in the bilateral remittance volume when costs decrease. Migrants are more incentivized when the costs are down, resulting in higher disposable income for recipient families, which further supports their financial needs. It implies that cost is an important factor in remittance transfer in the studied corridors. Our findings align with the "planned behavior theory" by Ajzen (1991), claiming that remitters renounce remitting through official channels if the cost of remitting increases.

Other outcomes from our findings show that it can be argued that financial markets and institutions are considered key players both in the host and destination countries. In the host countries, banks are supposed to be fully equipped with transaction details and have a negligible impact from any bureaucracy (primarily in the money market). Additionally, the cost reduction of remitting may be influenced by several factors such as time and speed of transaction, the distance between home and host migrants' countries, the money market situation, and economic conditions.

Further, exchange rate determination could be a key consideration in currency exchange that widely affects the world currency position and its influence on the global market. The appreciation and depreciation largely depend on the demand and supply of the currency in the world market. Our findings show that the exchange rate coefficient in the home country is positive and statistically significant with remittance inflows. This indicates that a depreciation of the recipient country's currency against the US dollar leads to a higher amount of remittance in local currency.

The IV technique reveals that banks play a crucial role in the transfer of remittances, which is widely dependent on how the banking system or money market operates in a country. In this vein, one recommendation could be that banks be developed to be directly involved in money transactions and promote ease of doing business to attract more banks to operate. Additionally, encouraging a higher amount of transactions by charging low costs may be an incentive to increase remitted transfers. Further, it is recommended to digitalize banking services and implement shorter processing times, resulting in lower costs of remitting.

A crucial policy implication from this study is to minimize remitting costs, a significant policy that likely enhances remitters' behavior to remit through formal channels (planned behavior theory, Ajzen,1991) and benefits the formal economy, boosts financial inclusion, and improves the net income of recipient households (Ahmed et al., 2021). Future studies might include additional variables along with different country cases and emphasize other regions and corridors highly dependent on remittances. The rising migration and remittance amounts could focus on financial market and governance contributions, highlighting the common influences of these markets on remittance transactions. Moreover, the influences of capital markets, especially the stock market, on remittance industries also provide avenues to explore in this study.

Funding: This study received no specific financial support.
Institutional Review Board Statement: Not applicable.
Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
Data Availability Statement: Upon a reasonable request, the supporting data of this study can be provided by the corresponding author.
Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

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Appendix 1.

Table 1. Cost of remitting and remittances: Fixed Effects panel technique.

Dependent variable: Bilateral Remittances	Bilateral Remittance Volumes	Bilateral Remittance Volumes	Bilateral Remittance Volumes	Bilateral Remittance Volumes	Bilateral Remittance Volumes	Bilateral Remittance Volumes	Bilateral Remittance Volumes	Bilateral Remittance Volumes	Remittances (%GDP)	Remittances per Migrant	Bilateral Remittance Volumes
	1	2	3	4	5	6	7	8	9	10	11
Cost of remitting the equivalent of US$200 (log)	-0.494**	-0.460**	-0.516**	-0.581**	-0.488**	-0.460**	-0.460**	-0.598**	-0.272*	-1.166***	
	(-2.105)	(-2.005)	(-2.187)	(-2.460)	(-2.147)	(-2.005)	(-2.005)	(-2.553)	(-1.837)	(-3.731)	
Cost of remitting the equivalent of US$500 (log)											-0.357**
											(-2.022)
GDP (income) per Capita Home	1.147	1.832**	2.015**	10.542*	1.898**	1.832**	1.832**	1.624*	0.0551	3.079***	1.511*
	-1.421	-2.16	-2.325	-1.811	-2.264	-2.16	-2.16	-1.922	-0.103	-2.733	-1.764
GDP (income) per Capita Host	-0.000*	-0.000	-0.000	-0.000	-0.000*	-0.000	-0.000	0.000	0.000	0.001***	0.001
	(-1.810)	(-1.071)	(-1.420)	(-1.468)	(-1.855)	(-1.071)	(-0.365)	-0.76	-1.453	-10.93	-0.657
Interest rate Host	-0.0387										
	(-0.842)										
Foreign ER Home		0.889**	0.837**	1.111**	1.002**	0.889**	0.889**	1.198***	1.490***	0.94	1.294***
		-2.165	-2.022	-2.62	-2.436	-2.165	-2.165	-2.829	-5.571	-1.664	-2.974
Migrant Population			0.116								
			-1.013								
Age – Dependency				-1.659*				-1.54	-0.624	-2.477*	-1.279
				(-1.757)				(-1.641)	(-1.053)	(-1.979)	(-1.363)
Total Population					3.662			3.366	0.933	5.502*	3.522
					-1.659			-1.539	-0.675	-1.886	-1.578
Economic Crisis						-1.112		-14.18*	-15.15***	-117.0***	-13.54*
						(-0.768)		(-1.843)	(-3.119)	(-11.41)	(-1.716)
Inflation (Host)							-0.177	-0.528*	-0.560***	-4.362***	-0.504*
							(-0.756)	(-1.839)	(-3.088)	(-11.38)	(-1.709)
Constant	4.774	8.144	34.65	23.46*	-41.42	8.144	-5.31	-63.35	-16.71	-147.3**	-67.07
	-0.614	-0.794	-1.233	-1.758	(-1.313)	-0.794	(-0.582)	(-1.438)	(-0.600)	(-2.506)	(-1.490)
Number of Observations	91	91	91	91	91	91	91	91	91	91	91
R squared	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.93	0.97	0.98	0.93

Note: ***, **, and * denote significance at, respectively, the 1, 5, and 10% levels. Robust-t-statistics are in parentheses.

Table 2. Cost of remitting and remittances: instrumental variables technique.

Dependent variable: Bilateral Remittances	Bilateral remittance volumes	Bilateral remittance volumes	Bilateral remittance volumes	Bilateral remittance volumes	Bilateral remittance volumes
	1	2	3	4	5
Cost of remitting the equivalent of US$200 (log)	-1.345**	-1.365**	-1.403***	-1.348**	
	(-2.564)	(-2.534)	(-3.118)	(-2.475)	
Cost of remitting the equivalent of US$500 (log)					-1.268*
					(-1.867)
GDP (Income) per Capita Home	-0.0217		-0.0116	-0.197	-0.0722
	(-0.163)		(-0.0889)	(-1.527)	(-0.489)
GDP (Income) per Capita Host		-0.000***	-0.000***	-0.000***	-0.000***
	(-4.436)	(-4.444)	(-4.494)	(-3.187)	(-3.431)
Foreign ER Home	0.000	-0.001		-0.018	-0.036
	(0.00257)	(-0.0333)		(-0.413)	(-0.834)
Age – Dependency	0.028***	0.028***	0.028***		0.023**
	(3.098)	(3.427)	(3.183)		(2.211)
Total Population	1.680***	1.680***	1.680***	1.510***	1.660***
	(18.19)	(18.38)	(18.39)	(21.28)	(16.15)
Economic Crisis	-0.549**	-0.553*	-0.574***	-0.433*	-0.497**
	(-2.558)	(-2.552)	(-2.729)	(-1.870)	(-2.243)
Inflation (Host)	-0.012***	-0.013***	-0.013***	-0.011**	-0.012***
	(-2.865)	(-2.897)	(-2.954)	(-2.485)	(-2.592)
Constant	17.64***	17.45***	17.61***	18.98***	16.42***
	(7.481)	(9.030)	(7.787)	(7.058)	(6.715)
Statistics					
Observations	91	91	91	91	91
Number of countries	7	7	7	7	7
R-squared	0.806	0.806	0.805	0.777	0.768
Country and Time fixed effect	YES	YES	YES	YES	YES
Kleibergen-Paap (Underidentification test)	12.16	12.48	11.68	12.10	4.08
Cragg-Donald Wald F statistic (Weak identification test)	19.70	18.88	21.83	19.87	8.17
P-value Hansen Test	0.66	0.67	0.75	0.92	0.82

Note: ***, **, and * denote significance at, respectively, the 1, 5, and 10% levels. Robust-t-statistics are in parentheses.

Table 3. First-stage IV technique estimates.

Instruments	
Lag t-1 Cost of remitting ($200)	0.331**
	(2.25)
Money transfer suppliers (Banks and MTOs)	0.072***
	(3.77)
Speed of transaction	0.514**
Exogenous variables	(2.02)
GDP per Capita Home	0.065*
	(1.71)
GDP per Capita Host	0.000
	(0.42)
Foreign ER Home	0.054**
	(0.50)
Age – Dependency	-0.001
	(-0.51)
Total Population	-0.000**
	(-2.39)
Economic Crisis	0.169**
	(2.24)
Inflation (Host)	0.001
	(1.37)
Constant	-1.878**
	(-2.18)
Observations	91
Number of countries	7
R-squared	0.62

Note: ***, **, and * denote significance at, respectively, the 1, 5, and 10% levels. Robust-t-statistics are in parentheses.

Table 4. List of countries.

List of sending countries	List of receiving countries
Bahrain	Bangladesh
Kuwait	India
Oman	Nepal
Qatar	Pakistan
Kingdom of Saudi Arabia	Philippines
United Arab Emirates	Sri Lanka
	Indonesia

Table A. Variables definition and source.

Variables	Definition	Source
Bilateral remittances (US$)	Personal remittances received are the sum of personal transfers and employee compensation, as defined in the sixth edition of the IMF's Balance of Payments Manual. For a remittance-receiving country, the amount of remittances is calculated as the sum of the six remittance flows from the six GCC countries.	KNOMAD/World Bank
Cost of remitting	The average transaction cost of sending a remittance to country (i) is a simple average of the total percentage retained by each remittance service provider in the Remittance Prices Worldwide database for sending US $200.	World Bank, Remittances price Worldwide
GDP (Income) per capita	Income level per capita in current $US	WDI
Interest rate	The real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator	WDI
Foreign exchange rate (ER)	The ratio of Local Currency Units relative to United States dollars	WDI
Migrant Population	The number of migrants originating from the Remittances-receiving countries.	KNOMAD/World Bank
Age – Dependency	The ratio of dependents, people younger than 15 or older than 64, to the working-age population (between 15 and 64)	WDI
Total Population	Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.	PWT
Economic Crisis	A dummy variable equal to 1 for years reflecting shocks such as the 2017 oil price decline and covid19 pandemic	
Inflation, GDP deflator (Annual %)	The annual growth rate of the GDP implicit deflator, which shows the rate of price changes in the economy as a whole.	WDI