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Understanding the drivers of remittances to Pakistan

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UNDERSTANDING THE DRIVERS OF REMITTANCES TO PAKISTAN

David de Padua, Matteo Lanzafame, Irfan Qureshi, and Kiyoshi Taniguchi

NO. 733

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ABSTRACT

Remittances are an important source of external financing in Pakistan, amounting to around 10% of gross domestic product in 2021. As such, an appropriate understanding of the key macroeconomic drivers of remittances has important policy implications. Combining a database of bilateral remittances between Pakistan and its main remittance-sending countries with monthly macroeconomic data over 2003–2021, we use a Bayesian vector autoregression model to understand the drivers of remittances to Pakistan. Specifically, we do so by estimating the impact of various structural shocks on remittance growth in Pakistan. We find that macroeconomic variables, including economic activity, inflation, equity markets, and interest rates—both in Pakistan and migrants' host countries—play a significant role, and their contributions vary over time.

Keywords: remittances, macroeconomics, Pakistan

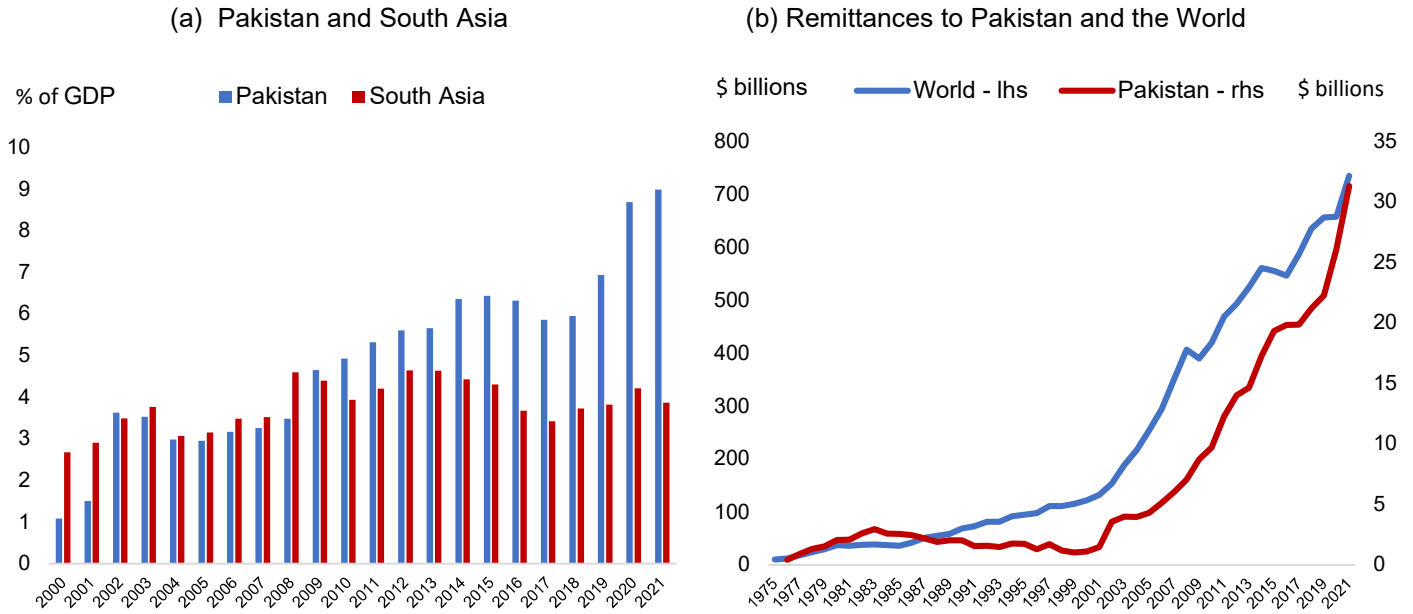
JEL codes: E7, F22, F24

1. Introduction

This paper investigates the macroeconomic drivers of remittances to Pakistan. In 2022, remittance flows to low and middle-income countries were estimated at \$630 billion. Understanding what drives remittances has become critical to policy in at least two ways. These flows help smooth consumption and positively impact poverty reduction (Adams and Page 2005). Policy can enhance this role of remittances, for instance, by reducing remittance transaction costs or incentivizing remittance receivers to channel spending to productive investments.

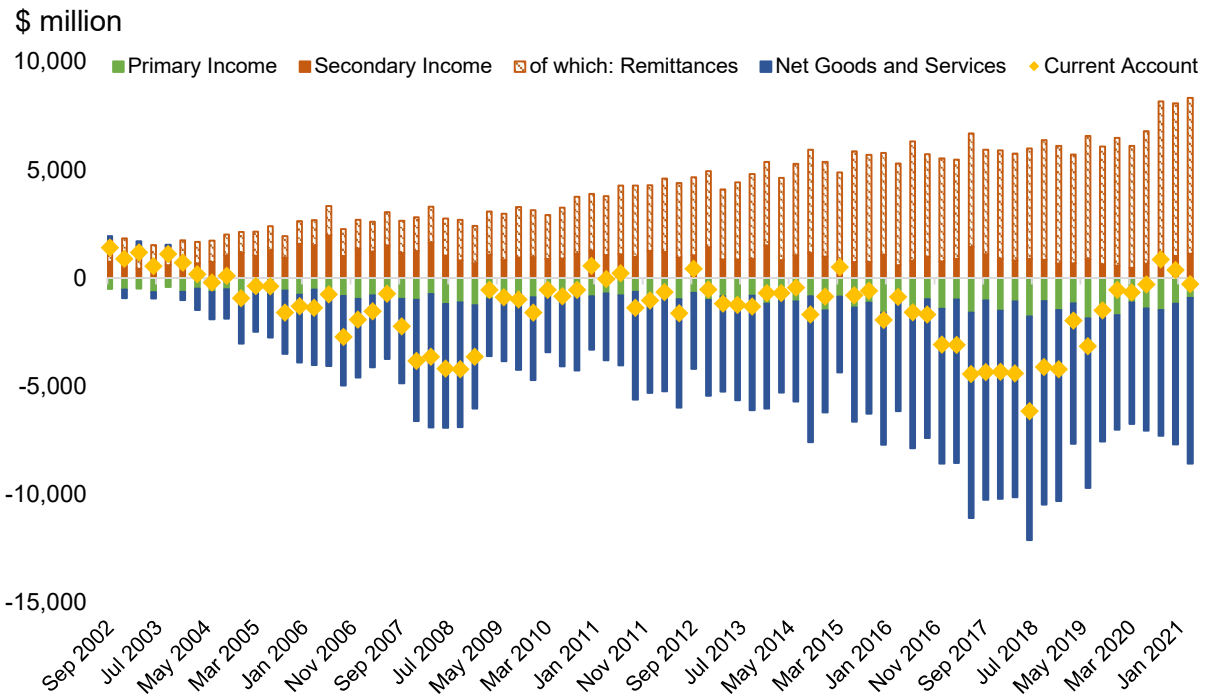
Remittances have played an important role in Pakistan's development process since the 1990s (Iqbal and Sattar 2005). These financial flows have also become crucial for macroeconomic dynamics in the country for three reasons. The first is their relative size. Following continued growth in the 2000s, remittances account for about 10% of Pakistan's gross domestic product (GDP), considerably higher than that for the South Asia as a whole (Figure 1a). The second is their relative stability. Remittances to Pakistan proved resilient to the impact of the Global Financial Crisis (GFC) of 2007–2008 and soared during the coronavirus disease (COVID-19) pandemic (Figure 1b). In 2021, Pakistan received \$31.1 billion in remittances from overseas, a 19.8% increase from the previous year. The third is that remittances have grown so large, which roughly equals the value of net imports of goods and services (Figure 2). As such, they have non-trivial effects on the balance of payments and macroeconomic stability (Bugamelli and Paterno 2005).

Figure 1: Remittances to Pakistan and Comparators



GDP = gross domestic product, lhs = left-hand side, rhs = right-hand side.
 Source: World Development Indicators.

Figure 2. Remittances in the Balance of Payments of Pakistan



Source: CEIC Data company.

Remittances are a well-documented phenomenon, owing to a large literature of micro and macro studies. Microeconomic studies on remittances focus on microeconomic data and surveys, typically looking at individual characteristics of remitters, such as education, sex, origin, income levels, and household characteristics. These studies tend to have a development focus and investigate behavioral aspects of remittances, relating to migrants' motives to remit or how remittance-receiving households spend the money received (Adams 2009, Lucas and Stark 1985). Macroeconomic studies, on the other hand, focus largely on the macroeconomic conditions that surround remittance decisions, looking at interest rate differentials, business cycles, or the impact of remittances on GDP growth (El-Sakka and McNabb 1999, Frankel 2009, Sayan 2006). The literature on the macroeconomic drivers of remittances is lacking as the evidence so far produced is mostly inconclusive.

There are two main advantages to undertaking a study on remittances with a macro perspective. Many studies explore the development impact of remittances or the microeconomic determinants of remittances, but few endeavor to unpack the influence of domestic and foreign macroeconomic variables on remittances. Second, it is well established that remittance flows behave differently from other types of capital flows. The motivations for remitting money are different from that of foreign direct investment or portfolio flows: they are sent to compensate for income shortfalls or to be invested on behalf of the remitter. Remittances are a boon for development and have increasingly become a pillar for macroeconomic stability. Understanding how migrant characteristics or demographics may influence long-term development outcomes is important. However, this does not provide insight into how changes in macroeconomic conditions can influence remittances, which, in turn, could potentially impact the macroeconomic stability of the remittance-receiving economy.

This paper aims to bring a macroeconomic perspective to the analysis of remittances to Pakistan. We use the theoretical framework Chami et al. (2008) proposed as a departure point to investigate the drivers of remittances and interpret our findings. Our analysis focuses largely on

the role played by receiving and sending-country macroeconomic and financial conditions in shaping remittance flows to Pakistan rather than attempting to disentangle the intertwined motivations to remit. As such, our approach does not dwell deeply on behavioral motivations but uses them to underline the economic intuition behind the dynamics of remittances and selected macroeconomic variables.

Using Bayesian vector autoregression (VAR) techniques and applying historical decomposition methods, we characterize the behavior of remittances to Pakistan in response to key domestic and foreign variables. To unpack country-specific dynamics, we run the VAR analysis for specific key remittance-sending partners: Saudi Arabia, the United Kingdom (UK), and the United States (US). We dig further into the drivers of these changes, using a historical decomposition approach to understand how the contributions of the drivers have changed over time and see how these changes are related to key economic events. Finally, we zoom in to specific crisis periods.

Our key results can be summed up as follows. We find macroeconomic factors to have a significant impact on remittance growth in Pakistan, notably economic activity in both home and host economies, domestic inflation, and to some extent, oil prices. The influence of these factors vary from country to country, reflecting considerable economic differences in host countries. We find that the importance of these factors evolved over time and different factors helped bolster remittance growth through crises.

The remainder of the paper is organized as follows; in section 2, we provide a review of the literature; section 3 discusses the VAR approach and describes the data; section 4 presents the results, first discussing the baseline model and then country-specific case studies; and section 5 concludes the paper.

2. Literature Review

2.1. Motivations to Remit

Lucas and Stark (1985) hypothesized that remittances were motivated by “pure altruism” and “pure self-interest.”¹ Sending money to family back home can be seen as motivated by the altruistic feelings of the migrant, ultimately deriving utility from their family’s spending. In contrast, migrants can also be motivated by self-interest, for example, sending money back home so that their household may invest the money on their behalf.

In practice, empirically disentangling and identifying these motivation patterns is nearly impossible, as these motivations can coexist and be latent. A migrant can send money for the receiver to both use for their own consumption and invest on their behalf. Moreover, the sparse and often non-standard remittance datasets are a limitation. Recognizing this, Chami et al. (2008) propose a framework that shifts the focus onto the economic impact of remittances. Here, the emphasis is on whether remittances are predominantly compensatory or opportunistic in nature. That is, do migrants send money to compensate for unfavorable economic conditions, or do they send money to take advantage of favorable economic conditions such as high returns? Bettin and Lucchetti (2015) find remittance time patterns depend on individual socioeconomic characteristics, and migrants who remitted in a previous year are more likely to remit the following year as well. Overall, this paints a picture of remittances as a persistent financial flow that is more stable than capital flows but also influenced by macroeconomic conditions in the home and host economies.

2.2. Remittances and Development Outcomes

The importance of remittances for development, particularly through poverty reduction, is well established. Adams and Page (2005) and Acosta et al. (2008) show that international migration

¹ They also describe a third category called “tempered altruism or enlightened self-interest,” which lies in between pure altruism and pure self-interest, where the migrant and family back home mutually benefit from the remittance.

and remittances significantly reduce the level, depth and severity of poverty in the developing world. Yoshino et al. (2017) find similar results for a set of 10 Asian developing economies. The impact of remittances on inequality is not as clear-cut. Some studies (Bouoiyour and Miftah 2014, Imai et al. 2014, Arapi-Gjini et al. 2020, Koczan and Loyola 2018) find that increased remittances alleviate inequality. Koechlin and Leon-Ciliotta (2006) find that as migration costs decline, migration becomes affordable for lower-income households, and their remittances from these migrants will tend to reduce inequality. This helps explain the conflicting findings in the literature, as the impact of remittances on inequality seems to depend largely on the underlying patterns of migration, which vary across time and countries. Further, Shen, Docquier, and Rapoport (2009) find that the dynamic relationship between remittances and inequality can be well characterized by an inverse U-shaped pattern, where the short- and long-term impacts on income inequality may be of opposite signs.

2.3. Remittances and Macroeconomic Factors

More than just poverty reduction, remittances can also have a significant macroeconomic impact. Meyer and Shera (2017) find remittances to have a positive impact on growth and that this impact increases at higher levels of remittances relative to GDP. Giuliano and Ruiz-Arranz (2009) find that remittances can promote economic growth in less financially developed countries. More generally, in a meta-analysis of the impact of remittances on economic growth, Cazachevici et al. (2020) find that 40% of studies report a positive effect, 40% report no effect, and 20% report a negative effect. While other capital flows tend to fluctuate with economic cycles, remittances are a stable source of foreign exchange (Ratha 2003) and can thus promote macroeconomic stability. Bugamelli and Paterno (2005) find that the stability of remittances can help reduce the probability of current account reversals. Aggarwal et al. (2011) report that by increasing deposits and credit intermediated by local banks, remittances help enhance financial development. Bettin and Lucchetti (2016) find that this persistence is not simply a result of the aggregation of remittances

but occurs at the individual level. They present strong evidence for the existence of persistent motives to remit or long-term agreements between senders and receivers.

While there is a well-developed literature on the macroeconomic impact of remittances, the macroeconomic determinants of remittances have not been studied as extensively. Much of the focus in this strand of literature has been on how economic conditions—particularly GDP growth—or business cycles influence remittances. El-Sakka and McNabb (1999) investigate the impact of conditions in host and home economies on remittances using GDP per capita but find the relationship insignificant. On the other hand, Frankel (2009) finds that remittances also tend to be countercyclical with respect to income in the migrant's home country. That is, migrants remit more in times of downturns or following disasters. Huang and Vargas Silva (2006) use a VAR, and find that host economic conditions are the most important factor driving remittances. Coulibaly (2009) uses a panel VAR for a sample of 16 Latin American and Caribbean countries and finds remittances respond positively to a boom in host countries, and a recession in home countries also increases remittances. Alleyne (2006) suggests that GDP and remittances are closely related, underscoring the need for an empirical approach suitable to control for endogeneity. We extend the VAR approach and tie in with the compensatory vs opportunistic framework of Chami et al. (2008), which are intrinsically related to the concepts of altruism and self-interest but more closely linked to economic conditions. This approach is thus more easily applied for building intuition behind broad macroeconomic data, where individual migrant behaviors or motivations are imperceptible.

3. Data and Methodology

3.1. Data

Our empirical analysis relies on monthly data from January 2003 to December 2021. This includes data on bilateral remittances between Pakistan and 16 other major economies that represent about 70% of total remittances to Pakistan. We further supplement the dataset with key macroeconomic indicators that may be associated with remittance fluctuations. These include inflation, interest rates, equity indices, exchange rates, VIX, global oil prices, and imports as a proxy for economic activity.² We collect these indicators for Pakistan and the remittance-sending economies and include domestic and migrant host-country variables in our model specification. Our motivation for doing so is to separate the impact of domestic macroeconomic factors from that of remittance-sending economies. To aggregate the macroeconomic factors of economies abroad, we sum imports across foreign countries as the measure of economic activity and generate GDP-weighted averages where appropriate.³ The complete set of variables, details of transformations, and data sources are reported in Table 1.

Variables that are in levels are transformed into year-on-year growth rates, while variables already expressed in percent enter the model unchanged. Using growth rates ensures stationarity and facilitates the historical decomposition analysis such that the estimated contributions sum up to the monthly growth of remittances, simplifying the interpretation of the estimates. The bilateral remittance database of the State Bank of Pakistan serves as the base dataset. It is completed with monthly macroeconomic data obtained from Haver, CEIC, and Bloomberg.

² High-frequency GDP estimates are rare, and the availability of high frequency proxies, such as industrial production, are limited for some economies in our sample. As such, this study follows De Soyres et al. (2022) and uses total imports as a proxy for destination-specific aggregate demand.

³ GDP-weighted averages are used for inflation, interest rates, and equity indices for economies abroad.

Table 1: Data Samples, Period, and Sources

Sample	Period	N	T	Obs.
Australia, Belgium, Canada, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, Pakistan, Qatar, Saudi Arabia, Spain, Switzerland, United Kingdom, United States (aggregated)	2003m1 to 2021m12	16	234	234

Variables	Unit	Description	Source	
	Remittances	Percent change	Yearly change in remittances to Pakistan	State Bank of Pakistan
Economic factors	Economic activity (monthly imports)	Percent change	Domestic: Yearly change in Pakistan imports Abroad: Yearly change in imports of foreign economies in sample	CEIC Data Company
	Equity index	Percent change	Domestic: Pakistan KSE 100 Abroad: GDP weighted average of changes in equity indices of foreign economies in sample	CEIC Data Company, Haver Analytics
Policy factors	Exchange rate	Percent change	Yearly change in PRs/\$ exchange rate	CEIC Data Company
	Inflation	Percent	Domestic: CPI inflation Abroad: GDP-weighted CPI inflation of foreign economies in sample	CEIC Data Company
	Interest rates	Percent	Domestic: Pakistan money market rate Abroad: US 3-month Treasury bills	CEIC Data Company
Global factors	Oil prices	Percent change	Yearly change in average spot price of Brent, Dubai, and WTI	CEIC Data Company
	CBOE Volatility Index (VIX)	Percent change	Measure of financial volatility	CEIC Data Company

CBOE = Chicago Board Options Exchange, CPI = consumer price index, GDP = gross domestic product, KSE = Karachi Stock Exchange, US = United States, WTI = West Texas Intermediate.

Source: Authors.

3.2. Methodology

We use a Bayesian VAR approach to estimate the impact of the macroeconomic factors on remittances. The general model, with n endogenous variables, m exogenous variables and p lags, in compact form can be written as:

$$Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \dots + A_p Y_{t-p} + C x_t + \varepsilon_t, \text{ where } t = 1, 2, \dots, T \quad (1)$$

$Y_t = (Y_1, Y_2, \dots, Y_n)$ is an $n \times 1$ vector of endogenous variables; A_1, A_2, \dots, A_p are p matrices of dimension $n \times n$; C is an $n \times m$ matrix and x_t is a $m \times 1$ vector of exogenous regressors, which can include time trends, constant terms, or exogenous data series. $\varepsilon_t = (\varepsilon_{1,t}, \varepsilon_{2,t}, \dots, \varepsilon_{n,t})$ is a vector of residuals following a multivariate normal distribution, assumed to be non-autocorrelated. The use of a Bayesian VAR approach stems from the effectiveness of Bayesian techniques in dealing with identification issues and addressing overparameterization, given the limited sample size and relatively large number of variables in the specified model. The variables enter the specification in the following order: economic activity, equities, short-term interest rates, exchange rates, inflation, oil, Chicago Board Options Exchange (CBOE) Volatility Index (VIX), and remittances last. A Cholesky decomposition, which orthogonalizes reduced-form errors to identify structural shocks, is used as an identification strategy. This imposes the assumption that variables ordered later in the model do not have a contemporaneous effect on the other variables in the model.

The analysis proceeds in the following steps. First, we run an aggregate model to establish an average pattern for remittances to Pakistan vis-à-vis all remittance-sending economies. In this setup, the right-hand-side variables in (1) are weighted averages of the variables in Y_t and X_t , except for the interest rate—which is proxied by the US Federal Funds rate. We then move on to a VAR analysis of bilateral remittance flows between Pakistan and the three most relevant remittance-sending economies—Saudi Arabia, the UK, and the US—which allows us to infer country-specific dynamics of the variables in the system.

For both the aggregate and country-specific models, historical decompositions of the contributions to remittance dynamics are constructed. To illustrate, consider a simple case where the VAR model has only one lag:

$$Y_t = A_1 Y_{t-1} + C x_t + \varepsilon_t \quad (2)$$

By backward substitution:

$$\begin{aligned} Y_t &= A_1 Y_{t-1} + C x_t + \varepsilon_t \\ &= A_1 (A_1 Y_{t-2} + C x_{t-1} + \varepsilon_{t-1}) + C x_t + \varepsilon_t \\ &= A_1 A_1 Y_{t-2} + C x_t + A_1 C x_{t-1} + \varepsilon_t + A_1 \varepsilon_{t-1} \end{aligned} \quad (3)$$

Going on, one may go back to the beginning of the sample and in general for a model with p lags, one can rewrite Y_t as:

$$Y_t = \underbrace{\sum_{j=1}^p A_j^{(t)} Y_{t-j}}_{\text{Historical contribution of deterministic variables}} + \underbrace{\sum_{j=0}^{t-1} C_j x_{t-j} + \sum_{j=0}^{t-1} B_j \varepsilon_{t-j}}_{\text{Historical contribution of structural shocks}} \quad (4)$$

where matrix series $A_j^{(t)}$, C_j and B_j are functions of A_1, A_2, \dots, A_p . The t superscript emphasizes that the matrix $A_j^{(t)}$ depends on $t = 1, 2, \dots, T$ while C_j and B_j do not. The matrices B_1, B_2, \dots, B_{t-1} provide the response of Y_t shocks and are thus the series of impulse response function matrices, which can then be represented in terms of structural shocks.⁴

Y_t can thus be separated into two parts: the first being deterministic exogenous variables and initial conditions, and the second due to the contribution of structural disturbances affecting the dynamics of the model. These provide an interpretation of historical fluctuations in the modeled time series through the lens of the identified structural shocks to remittance flows. This extension of the analysis allows us to determine whether the importance of each of the variables

⁴ For a more detailed discussion, Dieppe et al. (2018) provide a step-by-step exposition of this process in in the technical guide for their Bayesian Estimation, Analysis and Regression Toolbox.

in the system varies over time, providing valuable insights for a sample period that includes spells of rapid growth in remittances, the GFC, and the COVID-19 pandemic.

Table 1: Model Summary

Model	Variable of Interest	Economic Factor	Other Factor	Global Factor
Aggregate	Remittances to Pakistan	Economic activity (monthly imports) Equities	U.S. Federal Funds rate Exchange rate – PRs/\$ Inflation – weighted average of sample	Global oil price VIX
Country-specific	Remittances to Pakistan	Economic activity (monthly imports) Equities	Short term interest rates Bilateral exchange rates Inflation	Global oil price VIX

Source: Authors.

Using VAR and historical decomposition techniques, we characterize the behavior of remittances to Pakistan in response to key domestic and foreign variables. Using a historical decomposition approach, we dig further into the determinants of these changes. This shows how the drivers' contributions have changed over time, particularly in relation to key economic events. Finally, we zoom in to specific crisis periods to illustrate whether any of the aggregate patterns and factors driving remittances change during such episodes. We outline and discuss our results next.

4. Empirical Findings

4.1. Baseline: Aggregate Model

This section presents and discusses the baseline estimates of the aggregate model, which characterizes the behavior of remittances to Pakistan in response to key domestic and foreign variables. Throughout the analysis, the interpretation of results relies on (orthogonalized) impulse response functions (IRFs) for a period covering up to 24 months. The IRFs document the impact of a shock to each of the drivers of remittances and trace their evolution over time. For ease of presentation, the discussion of the empirical results is organized by groups of endogenous

variables, starting with the impact of shocks related to economic activity, followed by policy factors, and finally, touching briefly on the global factors.

The findings indicate that domestic and abroad economic activity is positively associated with remittances to Pakistan. Stronger economic activity abroad typically boosts average earnings for migrants, which, in turn can translate into higher remittances (Figure 3). The positive association between remittances and domestic economic activity indicates that migrants tend to remit more when economic conditions are improving back home. This suggests that there is an opportunistic dimension to the remittance motives of Pakistani migrants: that is, to some extent, they remit money to take advantage of investment opportunities in times of economic upswings in their home country. This contrasts with findings suggesting that remittances are countercyclical.

The results also show evidence of a negative association between domestic equities and remittance growth: a decline in Pakistan's stock index leads to an increase in remittances (Figure 3). One possible interpretation of this result suggests a wealth effect is at play. Migrants send more money home to compensate for losses from the stock market. However, in the period under analysis, the equity market in Pakistan was relatively underdeveloped and remains so even now compared to regional peers. At the end of 2021 the overall stock market valuation was only 15% of GDP—compared to, for instance, 48% in Indonesia or 93% in the Philippines. In addition, according to the State Bank of Pakistan (SBP), household savings are low, with domestic savings averaging only 7% from 2015 to 2020. In contrast, the savings rate in Bangladesh was 22% and 29% in India over the same period. Moreover, less than half of national savings are channeled into the financial sector, suggesting that investing in equities is uncommon. Therefore, another possible interpretation of this finding is that the benchmark equities index functions as a barometer for political and economic conditions and prospects. Negative economic news is usually quickly reflected in stock valuations—as such, when business expectations and the economy's outlook worsen, equities fall. In such a case, the positive response of remittances suggests a compensatory dynamic to this perceived negative shock.

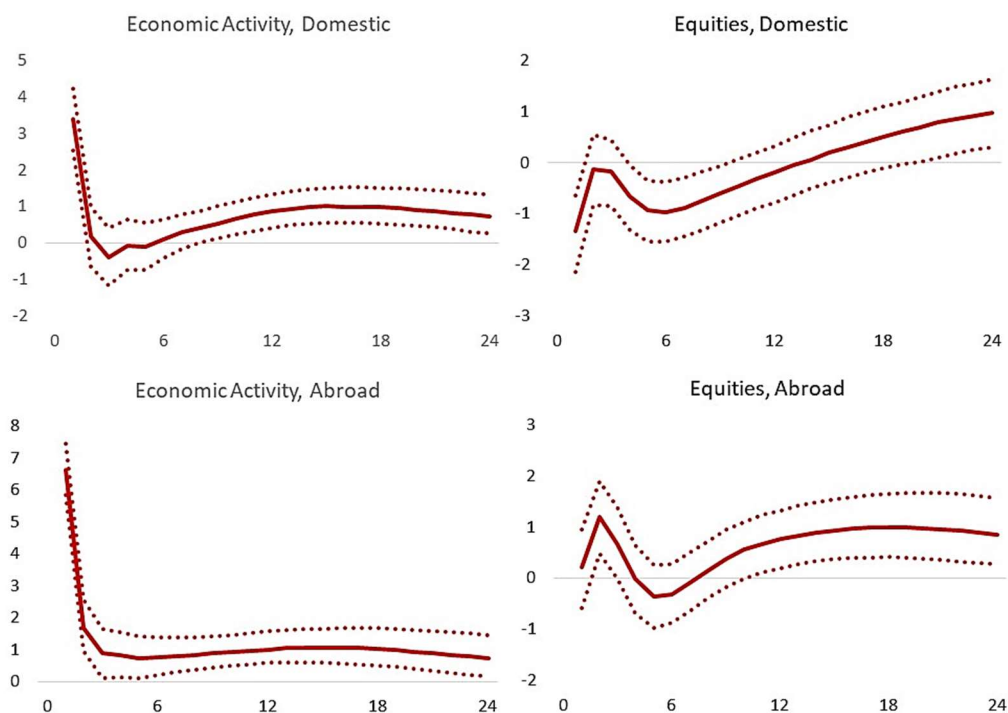
Table 2: Summary of Impact on Remittances for Baseline and Country Cases

	Aggregate	US	Saudi Arabia	UK
Economic activity				
Domestic	positive	positive	mixed	positive
Abroad	positive	positive	positive	mixed
Equities - domestic	negative	negative	negative	negative
Equities- abroad	mixed	positive	positive	negative
Policy factors				
Inflation – domestic	positive	positive	positive	positive
Inflation - abroad	positive	negative	mixed	positive
Interest rate - domestic	positive	mixed	mixed	negative
Interest rate - abroad	mixed	mixed	positive	negative
Exchange rate	positive	mixed	mixed	positive
Global factors				
Oil price	positive	positive	positive	positive
Financial volatility	mixed	positive	mixed	positive

UK = United Kingdom, US = United States.

Note: Boldface indicate relationships that are significant at 90% confidence intervals. Mixed refers to cases where the response of remittances is negative for some period and positive in others.

Source: Authors' estimates.

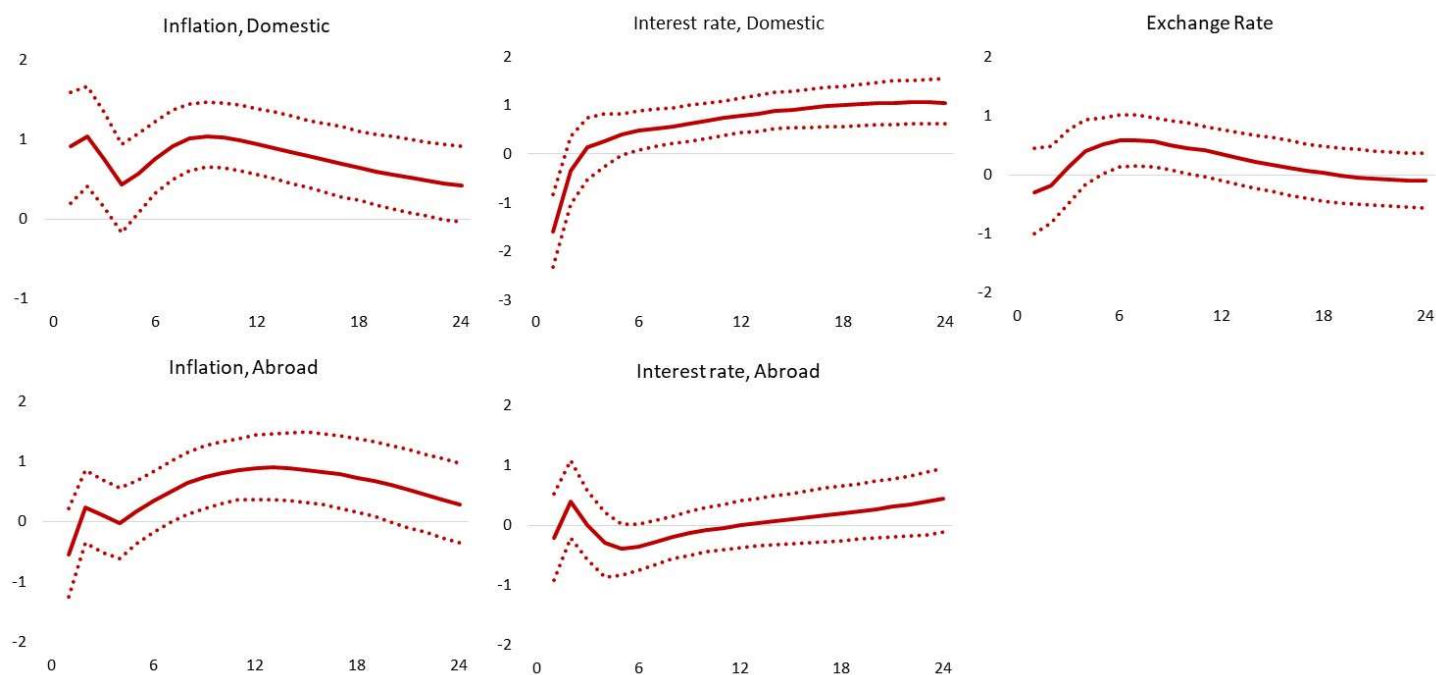
Figure 3: Impact of Economic Activity Shocks on Remittances

Note: Figures show orthogonalized impulse response functions for 24 months with 90% confidence intervals.

Source: Authors' estimates.

Results show that domestic inflation has a persistent positive impact on remittances, albeit not always statistically significant (Figure 4). That is, an increase in inflation in Pakistan translates into higher remittances. This result is also found in other studies (e.g., Rivera and Tullao 2020) and indicates that, in line with the altruistic motive to remit, migrants send more money back home when domestic inflation is accelerating and eroding households' real incomes.

The evidence gathered also indicates that a higher domestic interest rate initially results in lower remittances, but the effect turns positive and significant in the subsequent months (Figure 4). This is broadly consistent with several other studies that found that migrants remit more when interest rates back home are high. This suggests that migrants could be remitting money to take advantage of (relatively) improved investment opportunities in the form of higher interest rates back home, but they do so with some delay. In contrast, interest rates abroad do not exert a statistically significant impact through the 24-month period. Taken at face value, increasing interest rates in Pakistan compensate for typically higher risk premia, thus attracting more remittances for the opportunistic motive. The exchange rate is also broadly insignificant throughout the 24-month period considered—except briefly 6 months after the shock, when a depreciation is associated with more remittances.

Figure 4: Impact of Policy Factor Shocks on Remittances

Note: Figures show orthogonalized impulse response functions for 24 months with 90% confidence intervals.

Source: Authors' estimates.

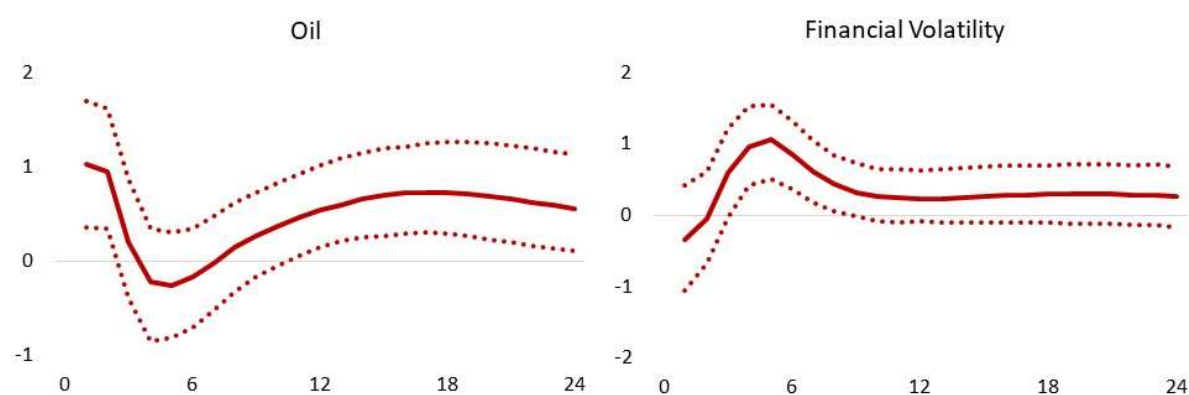
For global factors, the results show that rising oil prices are associated with a persistent increase in remittances (Figure 5). This empirical finding is likely to be mainly driven by the fact that Saudi Arabia, a global oil market maker, is a key remittance-sending partner economy, accounting for nearly a quarter of remittances on average over our sample period.⁵ The transmission mechanism can work via the host-country economic-activity channel as well as via a rise in inflation due to higher oil prices, which we have seen is positively associated to remittances. The results for the VIX, an indicator of financial volatility or uncertainty, suggest an increase in remittances when financial uncertainty spikes. As for equity valuations, this is consistent with the compensatory motive to remit, as investor sentiment typically worsens with

⁵ The next largest remittance-sending economies are the UK and the US, which accounted for an average of 11% and 20% respectively over the sample period.

increasing uncertainty. But the VIX effect on remittances is short-lived and becomes insignificant in subsequent periods.

Putting these results into the context of opportunistic or compensatory motives, it's useful to consider that these motives can coexist and both likely play a role for all variables in the model. As such, the sign and size of the impact of the estimates reflect the net effect of opportunistic and compensatory motives which work in opposite directions. Domestic activity is positively associated with remittances, suggesting opportunistic motives, while domestic equities are negatively associated with remittances, suggesting compensatory motives. This apparent contradiction can be explained. If the two effects are always in play, this apparent contradiction is easier to explain: depending on the variable considered, we find that one effect or the other dominates, so the sign can be either positive or negative.

Figure 5: Impact of Global Factor Shocks on Remittances



Note: Figures show orthogonalized impulse response functions for 24 months with 90% confidence intervals.

Source: Authors' estimates.

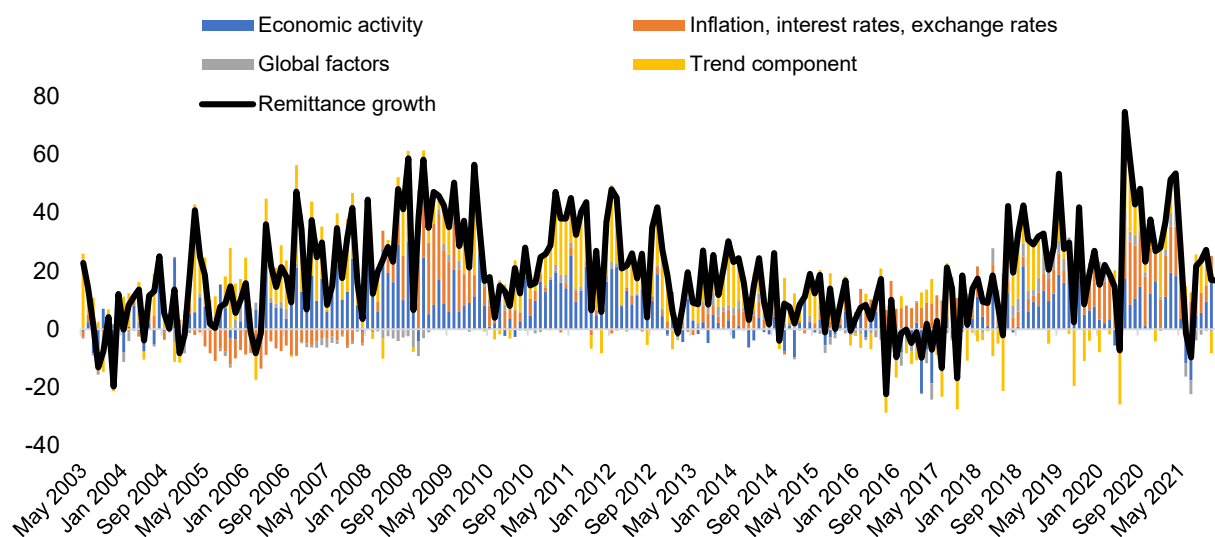
4.2. Decomposing Contributions to Remittance Growth

Having discussed the macroeconomic drivers of remittance flows, in this section, we decompose the growth of remittances into the contributions of the various factors we identified in the previous section. This exercise works by decomposing, for every period in the sample, the value of each

variable into different components corresponding to the other variables in the VAR. In this way, we can identify how much of remittance growth can be attributed to each macroeconomic variable—such as oil prices—based on the empirical model. To our knowledge, ours is the first paper to do so in the context of remittance flows to Pakistan. The decompositions are available for all the variables in the system, but for the purposes of this analysis, we focus only on the decomposition of remittances.

Figure 6 illustrates the results from the historical decomposition. The results show that the contributions of economic activity and other macroeconomic factors to remittance dynamics are sizable, amounting to roughly 18 percentage points of remittance growth on average over 2003–2021 and up to as much as 40 percentage points in some subperiods. Interestingly, the net effect of these factors changes over time. For instance, their overall contribution boosted growth in remittances from 2010 to 2012, but economic activity then dragged it down from 2013 through 2018—even leading to a decline in remittances in early 2017. This highlights the fact that macroeconomic stability, as well as fluctuations, matter as drivers of remittances. This is an especially important and policy-relevant finding. One specific example of this is the estimated impact of oil prices on remittances. Recall that the IRFs for these variables showed a positive relationship—that is, they move in the same direction—that persists for up to 2 years. Oil prices collapsed in 2020 as the COVID-19 pandemic weakened global demand: based on the historical decompositions, this subtracted as much as 9 percentage points from remittance growth and an average of 4 percentage points in 2021. More generally, in an economy such as Pakistan's, where remittances consistently buttress the current account, understanding how macroeconomic developments and macro-policy actions can affect these flows becomes crucial. In 2023, Pakistan faced severe balance-of-payments challenges, as it struggled to meet external debt payments as foreign exchange reserves plummeted. Remittances played a considerable role in this crisis, declining by 15% in January to October compared to the same period the previous year.

**Figure 6: Historical Decomposition of Remittance Growth
—Evolution of Drivers over Time**



Source: Authors' estimates.

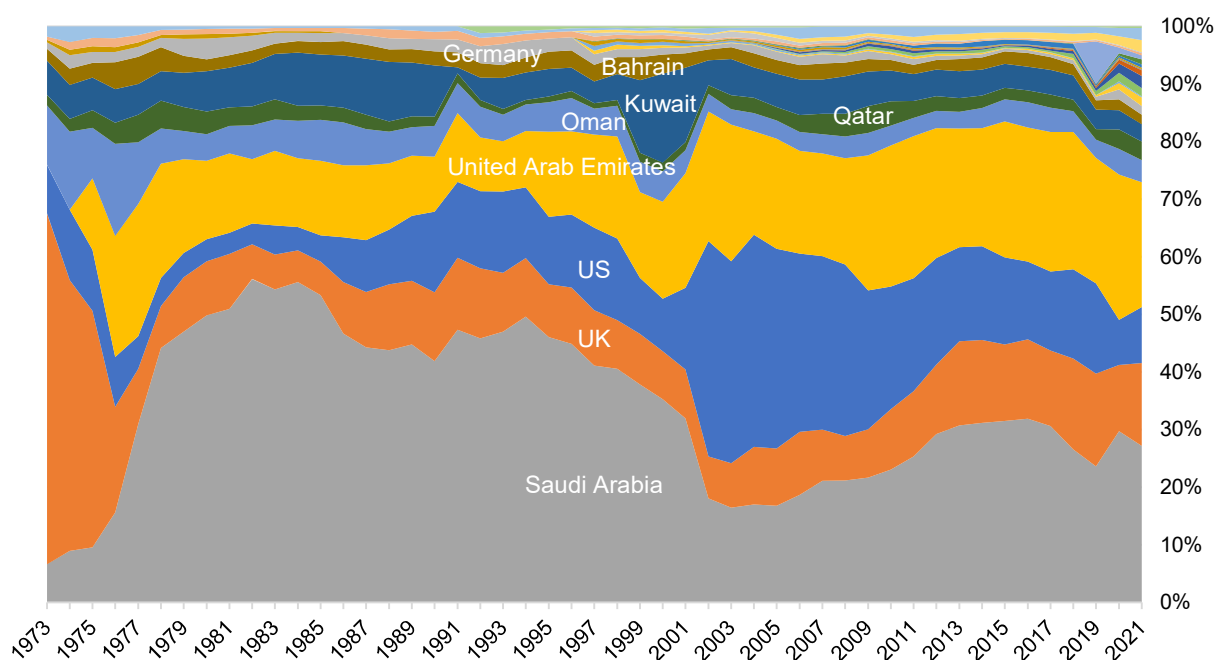
One additional interesting insight that merits discussion is that the contribution of the trend component is estimated to be relatively large. This can be taken as representing the structural factors that influence the growth of remittances outside of the variables identified in our model. This outcome is consistent with the evidence indicating that remittances are relatively stable financial flows, underpinned to a significant extent by motivations outside of fluctuations in macroeconomic variables. This trend component can be thought of as what remittance growth would be in the absence of shocks to the other variables. That remittance growth would have been positive through most of the sample period, even excluding the other factors, speaks to the persistence of remittances. One implication of this is that non-macroeconomic factors, such as the cost and ease of remitting or the number of migrants in host countries, matter to remittance growth. Additional scrutiny of this finding is beyond the scope of this brief but merits further research—particularly to investigate the extent to which these structural drivers can also be affected by policy, perhaps of a more micro-nature (e.g., taxation of remittances, financial innovation, and investment vehicles such as diaspora bonds).

4.3. Country Case Studies

4.3.1 Motivation

In this section, we investigate whether important country-specific dynamics may be masked by the aggregate model. To do so, we run country-specific Bayesian VAR's for three key remittance-sending partner economies: Saudi Arabia, the UK, and the US. In 2020, Saudi Arabia accounted for nearly a quarter of Pakistani migrants, while the UK and US accounted for, respectively, 8% and 6% of Pakistani migrants. Combined, the three economies are the source of roughly half of the remittances to Pakistan (Figure 7).

Figure 7: Remittances to Pakistan, by Country



UK = United Kingdom, US = United States.
Source: State Bank of Pakistan.

The impact of shocks on the drivers of remittances for the three country cases is summarized in Table 2. One finding uncovered by the aggregate model estimations that remains present across all the country cases is the positive and significant impact of domestic inflation on remittances. This evidence reinforces the view that, by eroding household incomes, accelerating

inflation in Pakistan prompts migrants to send more money back home. This is a not immediately intuitive but also relevant result—in that it highlights another trigger for the role of shock-absorber that remittances have historically played in Pakistan. The signs of the country-specific estimates are also consistent with the aggregate model results for domestic equities (negative) and the oil price (positive), although the relation is not always statistically significant.

The main outcome of the country-specific analysis, however, is that we find considerable variation. In all cases, country results differ to some extent from the aggregate-model findings, with the dynamics and significance of the impacts also varying from country to country. This calls for a more detailed investigation of country-specific dynamics.

4.3.2 United States

The US only accounts for a small portion of Pakistani emigrants but is a sizeable source of remittances for Pakistan. It accounted for roughly 20% of all remittances in the first half of the 2000s, though its share has declined in recent years (Figure 6). The results specific to the US show a significantly positive impact on equities, suggesting that migrants remit more when the US stock market is doing well, which is consistent with the host-country procyclicality hypothesis (Frankel 2009). Similarly, and in line with the (albeit weaker) evidence from the aggregate model estimates, financial volatility has a positive impact on remittances. One possible explanation for this is that migrants remit more in times of uncertainty, hedging against potential future losses. The fact that financial macroeconomic variables figure prominently in the case of the US, an economy with well-developed financial markets, is evidence that country-specific features—beyond just business cycles or GDP growth—matter for remittance dynamics.

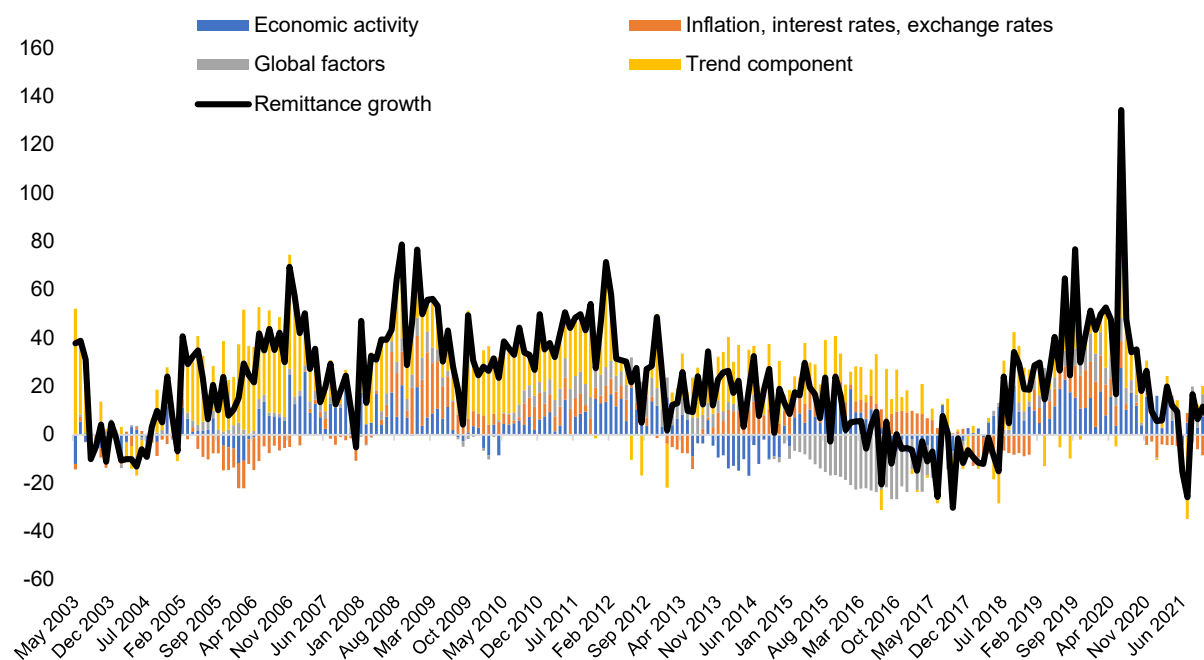
4.3.3 Saudi Arabia

Gulf economies are some of the most important sources of remittances for Pakistan. Saudi Arabia is a particularly important partner, accounting for roughly a quarter of total remittances and two million Pakistani migrants, most of whom are low-skilled workers or laborers. In this section, we examine the drivers of remittances from Saudi Arabia.

The historical decompositions (Figure 8) reveal that throughout the sample period, the trend component (yellow) dominates, illustrating the persistence of remittances as determined by structural factors outside the identified macroeconomic drivers. Economic activity (blue) is the second most dominant factor, suggesting that fluctuations in host and home conditions have contributed positively to remittance growth. There is a significant positive relationship between economic activity and remittances—that is, migrant workers remit more during economic upswings in their host country. The positive association of interest rates in Saudi Arabia with remittances seems counterintuitive at first. A decline in interest rate would signify relatively poorer investment opportunities in the host country, which could lead to higher remittances to seek investment in interest-bearing financial assets back home instead. However, the Pakistani migrant worker population in Saudi Arabia consists almost entirely of unskilled workers in the construction sector, suggesting income levels are likely not high enough for investment decisions to be a significant factor. Another key result for Saudi Arabia is the positive impact of global oil prices, which is likely driven by Saudi Arabia being a key global oil producer. Higher oil prices benefit the oil producers and thus likely cascade to the incomes of migrant workers there, who in turn remit more to family back home.

Finally, the global factors (gray) stand out from 2015 to early 2017, driven by plummeting oil prices during this period when the US increased production of shale oil and OPEC opted not to decrease production until early 2016. The substantial negative contribution of oil to remittance growth helps illustrate the dominance of oil in Saudi Arabia's economy and how fluctuations in global oil prices can have a significant impact on remittances from oil-exporting economies.

**Figure 8: Historical Decomposition of Remittance Growth
—Evolution of Drivers over Time, Saudi Arabia**



Source: Authors' estimates

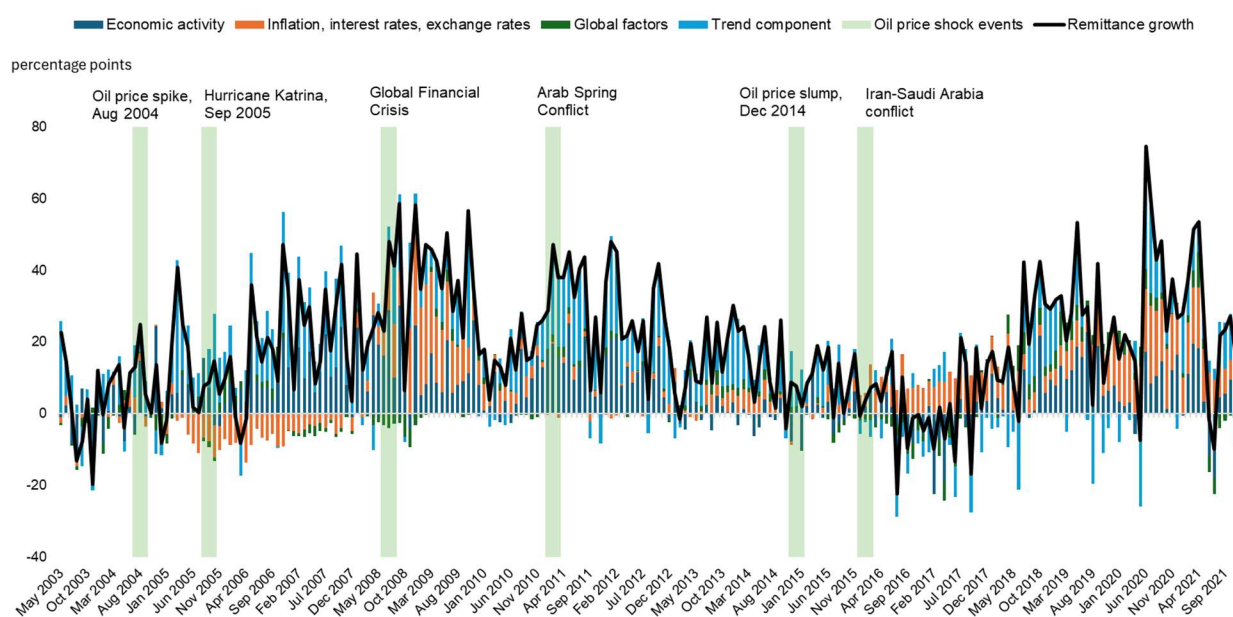
4.4. Selected Episodes

In this section, we contextualize the aggregate historical decompositions analysis by examining the drivers of remittances through various episodes of interest. First, we introduce oil price shock events to illustrate how they can help characterize the behavior of remittances. Next, we zoom in on two specific crisis episodes, namely the GFC and the COVID-19 pandemic, to contrast how different types of crises affect remittance flows to Pakistan. Finally, we examine the crisis periods separately in the two countries cases of Saudi Arabia and the US.

4.4.1 Oil Price Shock Events

The aggregate model and country-specific results both establish that oil prices are a significant factor that influences remittance growth. This section expands on the previous analysis with the addition of oil price shock events. Abiad and Qureshi (2023) constructed an index of oil price volatility and relied on it to identify periods of oil price spikes and slumps. These episodes are used to contextualize remittance growth in relation to periods of oil price volatility (Figure 9). We find that certain episodes are associated with spikes in remittance growth, and that the nature of the episode seems to be a factor.

Figure 9: Remittance Growth and Oil Price Shock Events



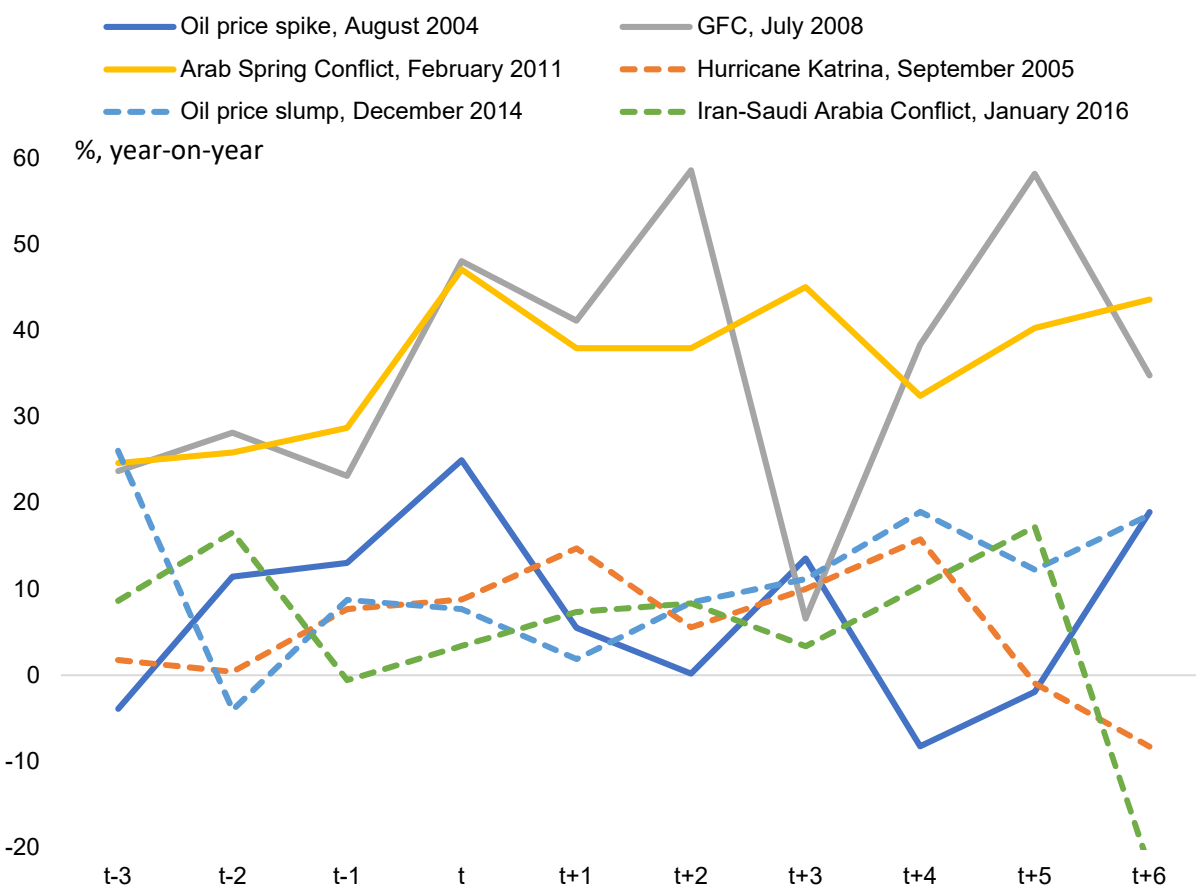
Source: Authors' estimates; Abiad and Qureshi (2023).

Figure 10 identifies three such episodes where oil price shocks coincided with a surge in remittances. Remittance growth increased in August 2004 when oil market speculation, rapid global growth, and concerns of geopolitical instability in oil-exporting economies led to a spike in oil prices. In early 2011, Arab Spring protests in the Middle East and Northern Africa caused oil prices to rise. This episode is associated with a sustained period of strong remittance growth, which averaged 35% for the 6 months following the beginning of the protests. These two periods

mark points when oil price spikes were associated with increases in remittance growth and provide a narrative around these episodes. In both cases, geopolitical instability in neighboring oil-exporting economies leading to higher oil prices were present, suggesting that these type of supply-side factors are associated with remittance growth. In contrast, remittances did not surge during the oil price spike driven by a collapse in US oil production due to Hurricane Katrina. This suggests that not all price spikes impact remittances, and that the type and source of the oil price shock matter.

The third episode that saw a surge in remittances to Pakistan was during the GFC when oil prices slumped. A decline in oil prices leading to an increase in remittances contrasts with our earlier results which established the opposite: remittances from oil-exporting host economies tend to increase when oil prices rise. However, while the previous episodes were supply-side oil shocks, the GFC was primarily financial in nature—with the slump in oil prices following a collapse in global economic activity. Intuitively, the surge in remittances could be driven by other macroeconomic factors that also coincide with lower oil prices. In the following section, we document the drivers specific to the GFC.

Figure 10: Remittance Growth through Oil Price Shock Episodes



Source: Authors' estimates.

4.4.2 Crisis Episodes

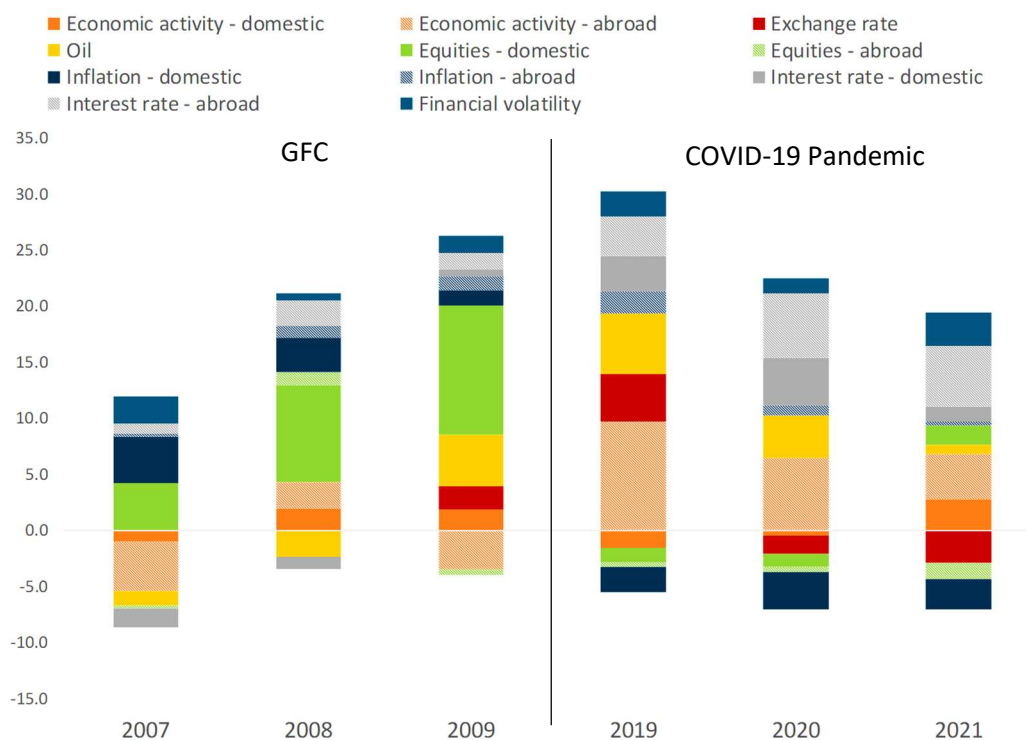
In this section, we zoom in on the GFC and the COVID-19 pandemic periods to contrast how the drivers of remittance growth vary across different types of crises. To do this, we refer to the annual averages of the contributions to remittance growth in 2007-2009 for the GFC and 2019-2021 for the COVID-19 pandemic (Figure 11).

Two factors stand out during the GFC. First, domestic equities made a substantial positive contribution to remittance growth. Recall that from the aggregate model, we found that a negative shock on domestic equities had the opposite impact on remittances. The KSE 100, Pakistan's benchmark equity index, collapsed during the GFC. After touching a high of 15,125 in early 2008,

the index went into free fall and plunged to as low as 5,377.4 in 2009. Plummeting equities drove remittances higher, as migrants used compensatory transfers to support family members back home for financial and other losses amid a serious economic downturn. The negative impact of economic activity for 2007 and 2009 is in line with this interpretation, shaving roughly 5 percentage points from remittance growth as economic slowdowns abroad presumably dented migrant incomes. In 2009, key remittance sending economies Saudi Arabia, the UK, and the US contracted by 2%, 4.5%, and 2.6% respectively. Inflation in Pakistan was also high during this period, averaging 13.2% from 2007 to 2009. This explains the consistent positive contribution to remittance growth through the crisis years. Migrants remitted more as their family members back home faced rising prices.

The COVID-19 pandemic was a fundamentally different crisis. While the GFC was, in essence, a financial crisis, the pandemic was a health crisis that had dire economic consequences. In this case, we find economic activity abroad made the largest contribution to growth through this period. COVID-19 did not have an immediate or simultaneous impact across the world, it spread gradually with specific economies shutting down more quickly than others. The results nevertheless show that the positive contribution of economic activity declined consecutively in 2020 and 2021, suggesting that remittances slowed as host economies lost momentum.

Figure 11: Historical Decomposition—Global Financial Crisis and COVID-19 Pandemic



COVID-19 = coronavirus disease, GFC = Global Financial Crisis.
Source: Authors' estimates.

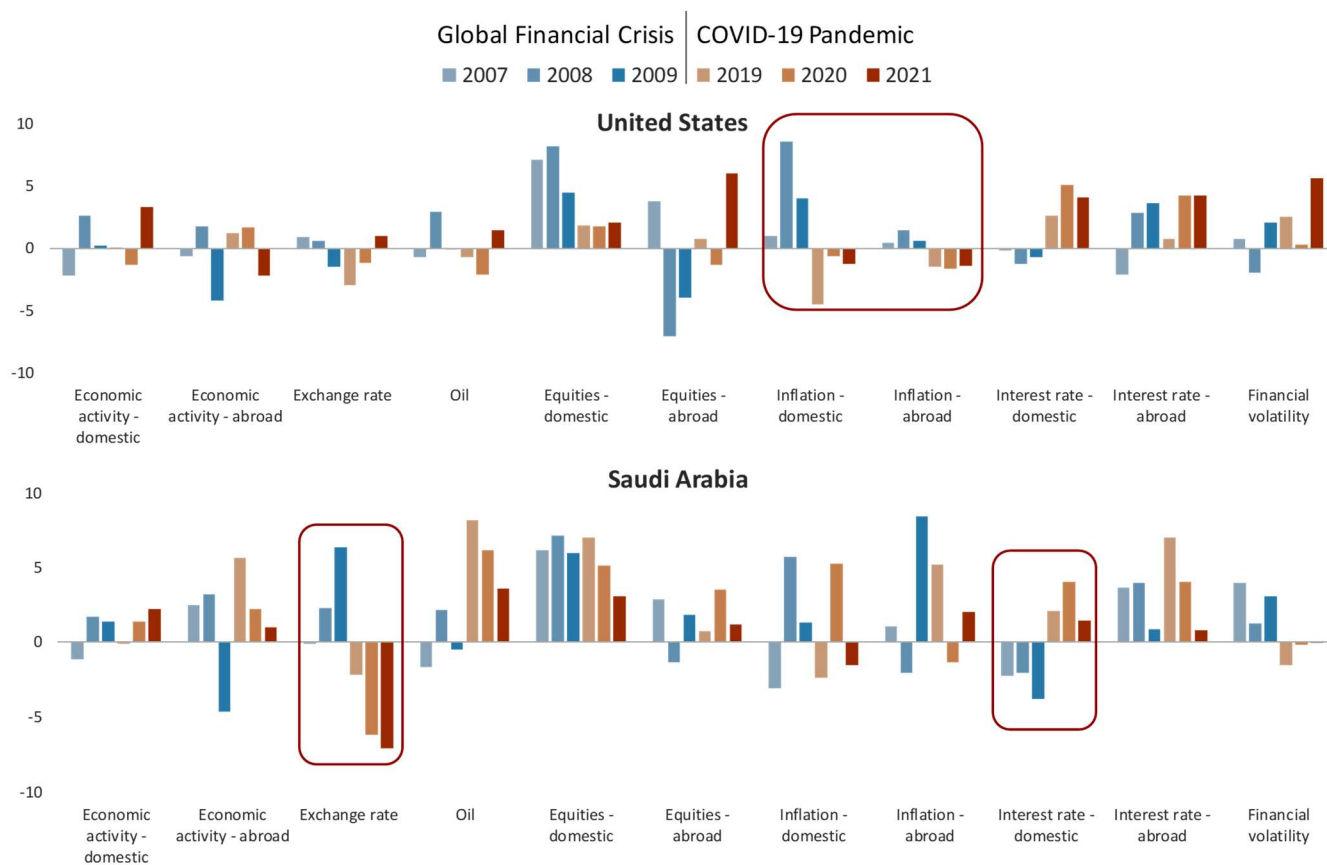
4.4.3 Crisis Episodes—Country Cases

To garner further insights, we carry out the same decomposition for the country cases of the Saudi Arabia and the US. Our findings show that the drivers of remittances from the two countries varied through the different crises (Figure 12). In the US, the contributions of inflation during the COVID-19 pandemic were opposite to their contributions during the GFC. That is, high and rising inflation in Pakistan during the GFC boosted remittances from the US, while weakening (but still high) inflation during the COVID-19 downturn reduced remittances. A similar pattern is evident for inflation in the US. In contrast, accelerating US inflation negatively affected remittances to Pakistan during the COVID-19 pandemic—likely because of spiking price pressures in 2021 denting migrants' disposable incomes.

In Saudi Arabia, we see this “flipping” pattern for the exchange rate and domestic interest rate. During the GFC, the Pakistani rupee depreciated significantly against the Saudi riyal. A stronger riyal translated into a higher local-currency value of remittances to Pakistan.

While not exhaustive, these results present some evidence of how fluctuations in key macroeconomic variables in partner economies matter. These relationships seen through periods of crises, typically characterized by extremes (e.g., high inflation, large depreciations), have also illustrated the bidirectional nature of the shock impacts. It becomes evident that the underlying economic context and circumstances driving the macroeconomic shocks are crucial to understanding how they might impact remittances.

Figure 12: Historical Decomposition—Country Cases



COVID-19 = coronavirus disease.

Source: Authors' estimates.

5. Conclusion

This study provides an assessment of the impact of macroeconomic variables on remittances to Pakistan. We characterize how changes in these variables, both domestically and abroad, can affect remittance growth. This can help policymakers disentangle the possible impact of macroeconomic variables on remittances. Specifically, we identify economic activity, domestic interest rates, and domestic inflation as having significant effects on remittance growth. We also find that the relative importance of these macroeconomic drivers has shifted over time—particularly during the deep crises of the GFC and the COVID-19 pandemic. Additionally, we find that remittances are largely influenced by structural factors outside of the variables identified in our model and that migrants' motivations, as identified in the microeconomic literature, likely underpin the persistence of remittance flows.

Understanding and using these relationships to anticipate fluctuations in remittance growth could be useful in analyzing the Balance of Payment (BoP) framework and potentially anticipating related pressures. For instance, Pakistan's current account deficit widened from 0.8% in 2021 to 4.6% in 2022. With global headwinds mounting alongside high food and energy prices, slowing global demand and rising interest rates abroad threaten external sector stability. Since remittances have historically served as a useful buffer to withstand BoP shocks, understanding better how these flows might evolve amid challenging global conditions is critical. In this respect, our results provide useful evidence for Pakistan's policymakers, which can be used as a basis to think through how changing macroeconomic conditions might impact remittances to the country.

Further research is necessary to unpack country-specific dynamics. While this aggregate model is useful to establish an understanding of the average impact of macroeconomic shocks, it almost certainly masks heterogeneity across remittance-sending partners where macroeconomic conditions vary greatly. For instance, growth and inflation dynamics in the US are very different from that of oil-rich Saudi Arabia, but both are major remittance-sending partners for Pakistan. Given the bilateral nature of the remittance dataset, digging into country-specific dynamics would

be a natural extension of the analysis presented in this paper and would provide more detailed insights to inform policy.

Thinking about remittances from a more general economic development perspective, our findings provide two main insights. First, the compensatory nature of remittances during crisis episodes, such as inflationary spikes or economic crises, indicates that these financial flows remain an important shock-absorbing mechanism for households in Pakistan. Policy can enhance this role played by remittances by linking fiscal incentives for remittances to some of the macroeconomic indicators considered in this paper—so that they would be triggered by particularly large drops in economic activity or price increases. Second, since the elevated persistence of remittances to Pakistan largely reflects deterministic factors, average remittance flows can be expected to remain significant going forward. Policy can play an important role in sustaining this trend—e.g., by fostering financial development to remove structural hurdles to remittances. Perhaps even more importantly, policy measures can incentivize the allocation of remittances toward productive investment both in physical and human capital. This would boost the economy's potential growth rate and, based on our estimates, ultimately reinforce remittance flows via the domestic economic activity channel. This virtuous circle could help underpin a more sustainable growth process in Pakistan.

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Understanding the Drivers of Remittances to Pakistan

Remittances are an important source of external financing in Pakistan, accounting for approximately 10% of gross domestic product. Combining a database of bilateral remittances between Pakistan and its main remittance-sending countries with monthly macroeconomic data over 2003–2021, we use a Bayesian vector autoregression model to understand the drivers of remittances. We find that macroeconomic variables, including economic activity, inflation, equity markets, and interest rates—both in Pakistan and migrants’ host countries—play a significant role, and their contributions vary over time.

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