

INTERNATIONAL MONETARY FUND

# What Explains Remittance Fees? Panel Evidence

Thorsten Beck, Mathilde Janfils and Kangni Kpodar

WP/22/63

**IMF Working Papers describe research in progress by the author(s) and are published to elicit comments and to encourage debate.**

The views expressed in IMF Working Papers are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

**2022**  
**APR**



WORKING PAPER

**IMF Working Paper**

Strategy, Policy and Review Department

**What Explains Remittance Fees? Panel Evidence****Prepared by Thorsten Beck, Mathilde Janfils and Kangni Kpodar\***

Authorized for distribution by Johannes Wiegand

April 2022

**IMF Working Papers describe research in progress by the author(s) and are published to elicit comments and to encourage debate.** The views expressed in IMF Working Papers are those of the author(s) and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

**ABSTRACT:** This paper uses data across 365 corridors to document time and country variation in remittance fees and explore factors predicting variation in remittance fees. We document a general reduction in such fees over the past decade although the goal of fees below 3 percent has not been met yet in many corridors. We identify both cost- and risk-based constraints and market structure as barriers to lower remittance fees. Higher transaction costs as result of a more rural population in the sending country and lower scale are associated with higher remittance fees. However, lower risks due to the stability of fixed exchange rates and Internet rather than cash payment are associated with lower remittance fees. Finally, remittance corridors dominated by banks and few players are characterized by higher fees.

JEL Classification Numbers:	F24; G5
Keywords:	Remittances; migration; access to financial services
Author's E-Mail Address:	<a href="mailto:Thorsten.Beck@eui.eu">Thorsten.Beck@eui.eu</a> ; <a href="mailto:Mathilde.Janfils@wise.com">Mathilde.Janfils@wise.com</a> ; <a href="mailto:KKpodar@imf.org">KKpodar@imf.org</a>

\* Beck: European University Institute and CEPR; Janfils: Wise; Kpodar: International Monetary Fund and FERDI. The authors would like to thank Sophia Chen, Patrick Imam, Asad Qureshi, Tito da Silva Filho and Yorbol Yakhshilikov for their insightful comments and suggestions. This research is part of the Macroeconomic Research in Low-Income Countries project (Project ID: 60925) supported by the UK's Foreign, Commonwealth and Development Office (FCDO). The views expressed in this paper are those of the authors and do not necessarily represent the views of the International Monetary Fund (IMF), or FCDO.

WORKING PAPERS

# **What Explains Remittance Fees? Panel Evidence**

Prepared by Thorsten Beck, Mathilde Janfils and Kangni Kpodar

# Contents

<b>I. INTRODUCTION</b>	<b>5</b>
<b>II. DATA</b>	<b>8</b>
A. REMITTANCE COSTS ACROSS CORRIDORS AND OVER TIME	8
<b>III. METHODOLOGY AND EXPLANATORY VARIABLES</b>	<b>13</b>
A. REGRESSION MODELS	13
B. EXPLANATORY VARIABLES	14
<b>IV. RESULTS</b>	<b>17</b>
A. CORRIDOR-LEVEL BASELINE REGRESSIONS	17
B. CORRIDOR-LEVEL REGRESSIONS: BANKS VS. MONEY TRANSFER OPERATORS	21
C. FIRM-LEVEL REGRESSIONS	29
<b>V. CONCLUSIONS</b>	<b>30</b>
<b>REFERENCES</b>	<b>35</b>
<b>FIGURES</b>	
1. Corridors with highest fees, 2020	9
2. Corridors with lowest fees, 2020	9
3. Average price of remittances for corridors with US as sending country	10
4. Average price of remittances for corridors with India as receiving country	10
5. Median price across corridors over time	11
6. Median price over time for banks and MTOs	12
<b>TABLES</b>	
3. Baseline Results	19
4. Developing to advanced corridors only	22
5. Remittance Costs across Corridors – Banks only	23
6. Remittance Costs across Corridors – MTOs only	25
7. Remittance Costs across Corridors – Western Union	27
8. Remittance Costs across Corridors – Moneygram	28
9. Remittance Costs across Corridors – Firm-level Variation	30
<b>APPENDIX TABLES</b>	
1. Summary statistics for regression sample	32
2. Correlation table	33
Variables, Definitions and Sources	34

## I. INTRODUCTION

Remittances are an important component of balance of payment flows across countries and reached \$559 billion to low- and middle-income countries in 2019.<sup>1</sup> For several developing countries, remittances are the most important source of international capital flows and remittances can have a critical impact on economic development and poverty alleviation, even though they are often only used for consumption. Notwithstanding its importance, the costs of sending remittances are still very high, but also show substantial variation across different corridors. High fees, however, can reduce remittance flows (Gibson, McKenzie and Rohorua, 2006; Aycinena, Martinez and Yang, 2009). This paper documents the variation across corridors and over time and identifies different factors associated with this variation.

Reducing the costs of remittances has been on the policy agenda for more than a decade. In 2009, the G8 member countries made a public commitment to reduce the cost of remittances by five percentage points over five years (the “5x5 Objective”). The Sustainable Development Goals include the objective to “by 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent” (SDG 10.C). But what drives remittance costs? To which extent can policy help lower these costs? And has the world made progress towards this goal?

Costs of financial services have been at the core of the academic and policy debate for decades. Philippon (2015) and Bazot (2018) show little movement in financial sector costs across advanced countries over past decades. Beck, Demirguc-Kunt and Martinez Peria (2008) document high but also varying costs of accessing financial services across developing countries. Information asymmetries and limited competition have been at the core of explaining continuously high costs. The recent entry of new players such as fintech companies might have increased competition, while digitalization might have reduced information asymmetries more generally in the financial sector. While these trends might have helped reduce financial service costs, the question is whether they have also helped reduce costs in the remittance market.

This paper uses data for up to 365 corridors from 2011 to 2020 to document development of remittance fees over time and across corridors and to explore the factors that explain variation in remittance prices across corridors. We rely on the World Bank’s Remittance Prices Worldwide database, which provides detailed cost analysis on the product level. Considering data for 2020, we find variation between 1 and 25 percent for a 200 USD remittance across corridors, but also significant variation across corridors for the same sending and the same receiving country. Over the period 2011 and 2020, remittance fees have declined significantly, but fees in most corridors are still above the 3 percent goal mentioned above.

---

<sup>1</sup> Due to Covid-19, remittances to low- and middle-income countries dropped to \$549 billion in 2020, a marginal decline of 1.7 percent compared to 2019, but surprised on the upside compared to the grim forecasts at the onset of the COVID-19 pandemic. See: <https://www.worldbank.org/en/news/press-release/2021/05/12/defying-predictions-remittance-flows-remain-strong-during-covid-19-crisis>

Financial service prices, such as remittance fees, reflect market frictions related to transaction costs and risks. Such frictions can arise on the country, firm- or product-level. In our regression analysis, we therefore include country- and corridor-specific factors related to such market frictions, including GDP per capita, population distribution and economic links between sending and receiving country, which might result in scale economies. Macroeconomic and regulatory policies might also impact transaction cost and risk of remittance service providers and we therefore include a number of variables capturing exchange rate regime and regulatory framework in sending and receiving countries. In addition to the cost incurred by the service providers, remittance fees also consist of a mark-up reflecting pricing power and thus market structure and competition. While we do not have granular data on market shares or competitive pressures, we use the number of providers and the share of banks among providers as proxies for the competitive environment within a corridor.

To test the importance of different factors explaining variation in remittance fees, we combine our price data with a number of country- and corridor-specific variables to exploit three different dimensions: variation across corridors, variation over time and variation across different remittance service providers within corridors. Five results stand out in our regression analysis: first, higher GDP in the sending country and easier geographic access to financial institutions is associated with lower fees, especially for banks. Second, scale economies matter: a larger market for remittances (as proxied by closer economic ties and a larger migrant population) is associated with lower costs as is a shorter distance between sending and receiving countries. Third, the market structure is important: banks charge higher fees than money transfer operators (MTOs), but a larger share of banks among remittance service providers is also associated with higher fees charged by MTOs. Unlike banks, MTOs' fees react to competitive pressures, with more market players being associated with lower MTO but not bank remittance fees. Fourth, in corridors where the sending country has a pegged exchange rate, both banks and MTOs charge lower fees. Finally, there is some evidence that cash payments attract higher fees, while payments over the Internet are charged lower fees. Other variables enter insignificantly or inconsistently across different samples: GDP per capita of destination countries enters negatively in the overall sample and the bank sub-sample but positively in the MTO subsample. Several regulatory variables we included enter with different signs across different regression models and subsamples.

Overall, our findings point to both cost- and risk-based constraints and market structure as barriers to lower remittance fees. Higher transaction costs as result of a more rural population in the sending country and lower scale can explain high remittance fees in some corridors. These structural factors indicate a limit to the extent to which remittance fees can be lower with policy actions. However, lower risks due to exchange rate stability and Internet rather than cash payment can reduce remittance fees. On the other hand, remittance corridors dominated by banks and few players are characterized by higher fees. Linking these findings back to the above-mentioned global policy objective of reducing remittance fees suggests that structural country factors might prevent a further drop in remittance fees, but that stronger competition, especially from non-bank providers, and digitalization might help reduce remittance costs. Similarly, exchange rate stability (or better hedging possibilities) might help reduce these costs. We would like to stress that we are careful in not implying causal inference from our regression analysis and are thus careful in drawing policy conclusions.

This paper relates to several literatures. First, it relates to a small literature on the cost of remittances. Freund and Spatafora (2008) and Orozoco (2006) are among the earliest studies on remittance prices. Bersch et al. (2021) find for a geographically more limited sample that remittance providers for Latin American destination countries are sensitive to price movements vis-a-vis their competitors, limited evidence for scale economies but lower fees in destination countries with higher levels of financial development. Da Silva Filho (2021) provides a recent and comprehensive review of the drivers of remittance costs. Kosse and Vermeulen (2014) analyze survey results on 501 migrants in the Netherlands, and show that education, costs, access, and financial development in the recipient country are important determinants of the choice of payment channel. Most importantly, our paper relates to Beck and Martinez Peria (2011) who use data on 119 corridors in 2009 to explore cross-sectional variation in remittance prices and find an important role for the size of the corridors and competition. Our paper adds to this literature by (i) using data across a much larger set of corridors, (ii) adding time variation and (iii) exploring differences across different types of remittance service providers.

Second, our paper also relates more broadly to a literature on the cost of financial services. Beck, Demirguc-Kunt and Martinez Peria (2008) document large cross-country variation in the costs to customers of opening and maintaining bank accounts and in the fees for using automated teller machines and for transferring funds, finding that firms report lower financing constraints in countries with lower costs of financial services. Further, an extensive literature has explored the determinants of interest rate spreads and margins (Demirguc-Kunt and Huizinga, 1998; Demirguc-Kunt, Laeven, and Levine, 2004; Laeven and Majnoni, 2005; Beck and Hesse, 2009). For advanced countries, Philippon (2015) and Bazot (2018) find that financial sector costs stagnated over past decades, although Philippon (2018) points to tentative evidence that digitalization and the emergence of fintech might be having a possible dampening impact on such costs. Our paper adds to this literature by focusing on a financial service critical for millions of migrants and their families across the globe, documenting its costs over the past decade and a large number of corridors and exploring the factors explaining this variation.

Third, our paper also relates to a broader literature on payment services, remittances and their impact. Aggarwal, Demirguc-Kunt, and Martinez Peria (2010) and Demirguc-Kunt et al. (2011) show that remittances can have a positive impact on financial development, using cross-country data and municipality-level data for Mexico, respectively. One important recent innovation in payment services has been mobile money. The impact of such new providers on payment patterns can be quite stark, as the example of M-Pesa in Kenya shows, shifting remittances from informal to formal channels (Beck, 2010). In a more general assessment, Mbiti and Weil (2011) find that the use of M-Pesa is positively related to the frequency of sending transfers, negatively related with the use of informal saving mechanisms such as ROSCAs, and positively associated with the probability of being banked. They also find that competitive pressures from M-Pesa forces competitors such as Western Union to reduce their prices. Remittances are among the most important financial transactions for populations with limited access to formal banking services. Receiving remittances can serve as entry point into the formal financial sector, as shown, for example, by Anzoategui, DemirgüçKunt, and Martínez Pería (2011).

Before proceeding, we would like to stress some important caveats. First, our study refers only to international remittances, although domestic remittances are a multiple of the amounts of international remittances. Second, we document partial correlations rather than inferring causality. While one can make a reasonable case that country characteristics such as GDP per capita, rural population share and geographic distance are exogenous to remittance prices, the market structure in a given corridor and regulatory policies might be driven by remittance fees rather than the other way around. We can also not control for omitted variable bias; however, this is less of a concern in our setting, as we do not test specific models or hypotheses.

The remainder of the paper is structured as follows. The next section introduces the data and illustrates the variation of remittance costs across corridors and over time. Section 3 discusses our regression methodology and the different explanatory variables. Section 4 presents the results and section 5 concludes.

## II. DATA

This section presents the remittance costs we are using in our analysis and document corridor-variation in remittance fees as well as variation over time. The Appendix Table defines all variables and lists the sources.

### A. Remittance Costs Across Corridors and Over Time

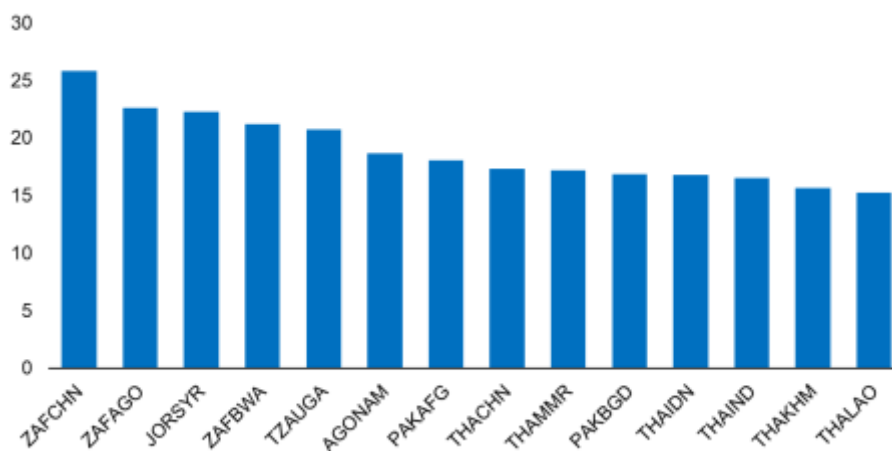
Our paper relies on Remittance Prices Worldwide, a dataset collected by the World Bank, with remittance costs across 365 corridors, including 48 sending and 105 receiving countries. Data is collected by researchers posing as customers and contacting firms within each corridor. Researchers collected data within each corridor on the same day for all providers, in order to control for fluctuations in exchange rates and other changes in fee structures. Data is collected for the major service providers in each corridor, including both the primary Money Transfer Operator (MTO) and banks active in the market, as well as the post office when available and offering remittance services. Companies surveyed within each corridor are selected to cover the maximum remittance market share possible, aiming at a minimum aggregated market share of 80 percent. Unfortunately, we do not know the market share of individual firms in the dataset, so we cannot run weighted regressions; to avoid the influence of outliers, we will focus corridor-level regression on the median fee per corridor and year, confirming results with the average fee (results available on request).

The dataset includes the costs for two amounts; the equivalents of \$200 and \$500 in local currency. In our analysis, we focus on the \$200 equivalent, but our findings are robust to using \$500 (results available on request). We focus on the fee paid by the sender of remittances. In 2020, the median remittance fee varied between 1 percent in the corridors between Russia and Azerbaijan, Georgia, Kazakhstan, Lithuania, Latvia, Moldova and Ukraine and 25.8 percent in the South Africa-China corridor. Figures 1 and 2 show the tails of the variation across corridors; Figure 1 shows the average price for corridors where the average price is above 15 percent, while Figure 2 shows corridors where the average price is below 3 percent. Six of the ten corridors with the lowest average price have Russia as sending country, with the receiving countries being



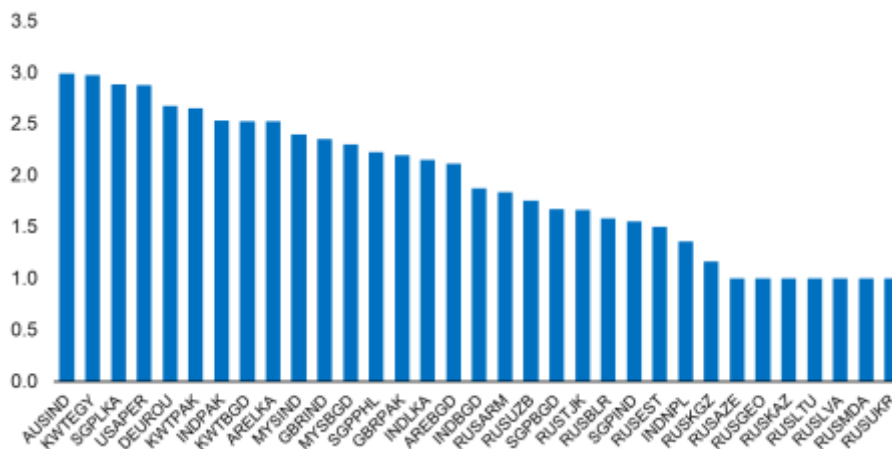
former Soviet Union member states, while the other four have India as sending or receiving country. Figure 1 shows corridors with Pakistan, Thailand, Jordan, South Africa and Tanzania as sending countries with the highest fees.

Figure 1. Corridors with highest fees, 2020



Sources: Authors' calculations based on Remittance Prices, Worldwide, World Bank

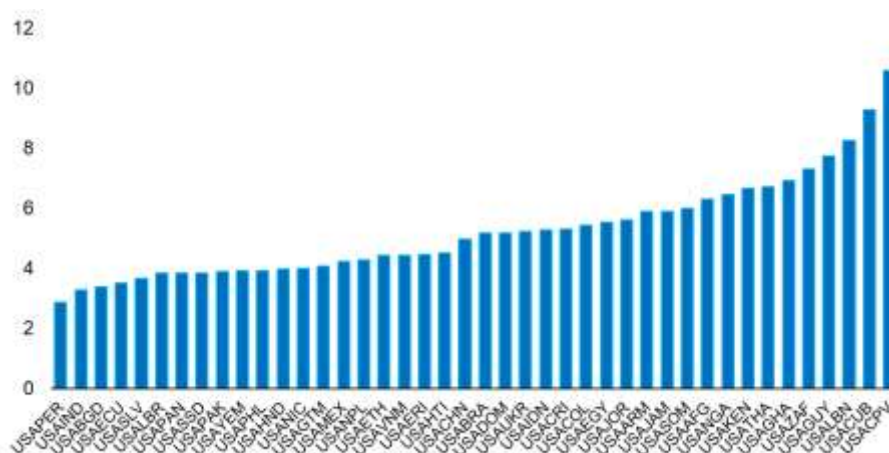
Figure 2. Corridors with lowest fees, 2020



Sources: Authors' calculations based on Remittance Prices, Worldwide, World Bank

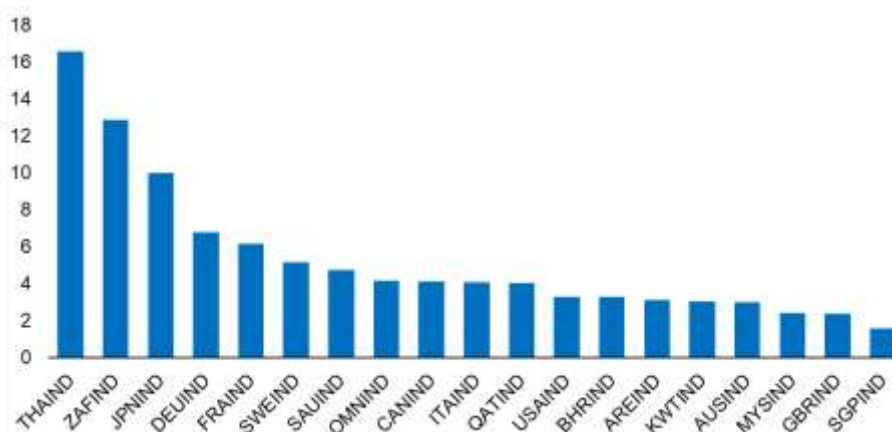
There is quite some variation even across corridors with the same sending or same receiving country. Figure 3 shows the variation for corridors that have the US as sending country, which ranges from 2.9 percent for remittances sent to Peru to 10.6 percent for remittances sent to Cape Verde. Figure 4 shows the variation in remittance prices for corridors with India as receiving country. In this case, remittance prices vary between 1.6 percent if sent from Singapore and 16.6 percent if sent from Thailand. This suggests that in addition to characteristics and policies on the (sending and receiving) country-level, corridor-specific factors also play an important role in explaining variation in remittance prices.

Figure 3. Average price of remittances for corridors with US as sending country



Sources: Authors' calculations based on Remittance Prices, Worldwide, World Bank

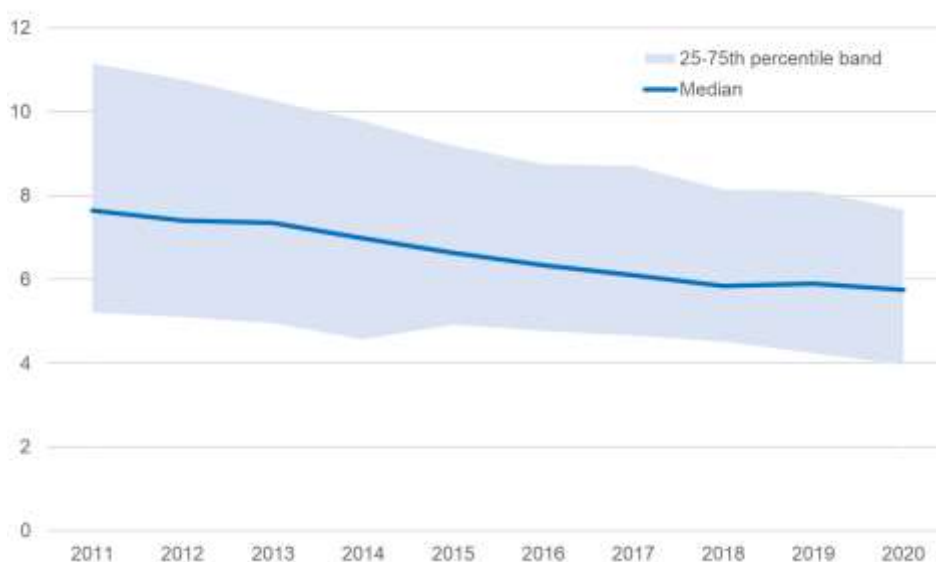
Figure 4. Average price of remittances for corridors with India as receiving country



Sources: Authors' calculations based on Remittance Prices, Worldwide, World Bank

Remittance prices have come down significantly over time, as documented in Figure 5. As we have an unbalanced panel of corridors over time, we focus on a subsample of 203 corridors, for which we have data over the whole sample period. The median remittance price has decreased from 7.7 percent in 2011 to 5.7 percent in 2020.<sup>2</sup> However, there has been a broad reduction across the distribution of remittance service fees. Fees at the 75<sup>th</sup> percentile decreased from 11.1 percent to 7.7 percent and fees at the 25<sup>th</sup> percentile from 5.2 percent to 4 percent. Notwithstanding, the majority of corridors still have median remittance fees of above 5 percent in 2020, suggesting that a lot more progress has to be made until 2030 to meet the Sustainable Development Goal of average fees of less than 3 per cent and no remittance corridors with costs higher than 5 per cent.

Figure 5. Median price across corridors over time



Sources: Authors' calculations based on Remittance Prices, Worldwide, World Bank

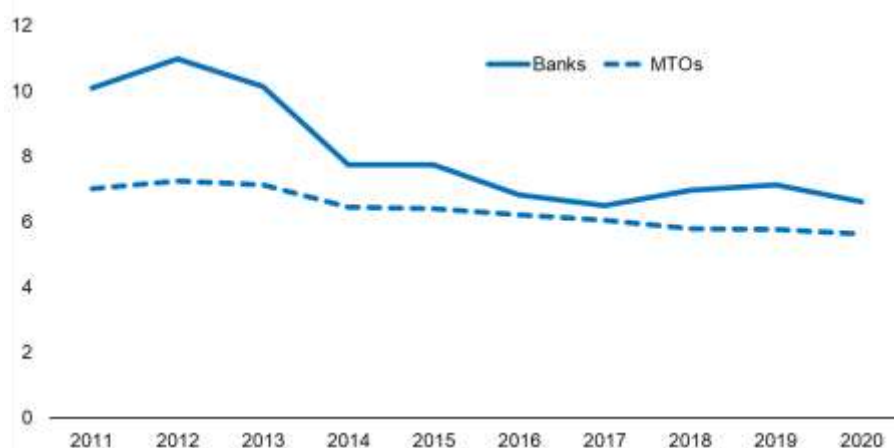
Figure 6 shows the median fee across balanced samples of 124 corridors for banks and 202 corridors for MTOs over the same ten-year period. For both banks and MTOs, the median fee has decreased over time, with the median bank fee, however, persistently being above the median MTO fee. Over the ten years of our sample period, the average share of banks in a corridor has decreased from 27 to 17 percent, while the share of MTOs has increased from 69 to 80 percent.

In addition to the fees, the database includes several other features of the remittance service. Specifically, for a sub-period (2016 onwards), we have data on the **payment instrument** that can be used by the sender, including (i) cash, (ii) bank account transfer, (iii) debit, credit or pre-paid card, and (iv) mobile money. Second, we have information on the **access point** where the

<sup>2</sup> We find a similar reduction in prices when limiting our sample to one provider only, such as Western Union or Moneygram.

transaction can be initiated by the sender, including (i) agent, (ii) bank branch, (iii) post office, (iv) Internet, and (v) mobile phone. Third, we have information on the **speed** of the transfer, with categories including (i) less than an hour, (ii) same-day, (iii) next-day, (iv) two days, (v) three to five days, and (vi) six or more days. We use this to construct a variable **Fast**, which indicates if the payment is done the same day or faster.

Figure 6. Median price over time for banks and MTOs



Sources: Authors' calculations based on Remittance Prices Worldwide, World Bank

There is quite some variation in payment instruments, access points and speed across corridors and over time. While the share of remittance fees corresponding to bank branch access has gone down over time to less than 5 percent in 2020, the share of fees corresponding to Internet access has increased (from 18 to 33 percent between 2011 and 2020). The share of fees corresponding to access through agents has stayed relatively stable between 40 and 45 percent. Post office, mobile phone or call center as access point make up only a small share of transactions. The share of cash payments in the sending country has decreased from 56 to 42 percent between 2011 and 2020, while the share of bank transfer and card payments has increased over time, constituting 34 and 12 percent, respectively, in 2020.

In terms of speed, the share of fees associated with transaction that arrive within one hour has increased from 43 to 56 percent between 2011 and 2020 and the share of same day transactions from 10 to 12 percent. Transactions in the slowest category (six or more days) have decreased from 8 to one percent. Transactions using mobile money are still very rare.

When considering correlations between the relative importance of access points, payment instrument and speed of transaction, we find that in poorer sending countries there are more providers offering access through bank branches and agents and fewer providers offering transactions through the Internet. Providers in poorer sending countries are more likely to offer cash transactions rather than bank transfer and card transactions and there is a small share of transactions being sent within one day or faster. Unlike banks, MTOs are more likely to offer access to transactions through agents, Internet and mobile phone. Banks (MTOs) are less (more)

likely to offer cash and card payments and more (less) likely to offer bank transfers. Transactions through MTOs are more likely than banks' transactions to arrive within a day.

### III. METHODOLOGY AND EXPLANATORY VARIABLES

What explains the variation in remittance fees across corridors, over time and different providers? This section presents the different regression models we use and introduces the different explanatory variables, discusses their rationale and present descriptive statistics and correlations.

#### A. Regression Models

To explore the factors that explain variation in remittance prices across corridors, firms and time, we run a variety of different models exploring the different dimensions we have available in the remittance price database and across the different groups of explanatory variables. Specifically, we first regress the median costs per 200 USD remittance in 2018 between countries  $i$  and  $j$ ,  $P_{ij}$ , using a cross-sectional model:<sup>3</sup>

$$P_{ij} = \beta_1 \text{ Sending country factors}_i + \beta_2 \text{ Receiving country factors}_j + \beta_3 \text{ Corridor-specific factors}_{ij} + \varepsilon_{ij} \quad (1)$$

Next, we combine corridor and time variation across years  $t$  between 2011 and 2020 in a pooled model, before including country- and year-fixed effects:

$$P_{ijt} = \beta_1 \text{ Sending country factors}_{it} + \beta_2 \text{ Receiving country factors}_{jt} + \beta_3 \text{ Corridor-specific factors}_{sijt} + \varepsilon_{ijt} \quad (2)$$

$$P_{ijt} = \beta_1 \text{ Sending country factors}_{it} + \beta_2 \text{ Receiving country factors}_{jt} + \beta_3 \text{ Corridor-specific factors}_{sijt} + \mu_i + \nu_j + \lambda_t + \varepsilon_{ijt} \quad (3)$$

We run this model using the median costs across all remittance service providers in a corridor, the median costs across all banks (MTOs) in a corridor and specifically for two providers (Western Union and MoneyGram) that are active across a large number of corridors. We lag all explanatory variables.

As second step we use firm-level variation, with  $f$  denoting firms, using the remittance cost per 200 USD remittance of firm  $f$  between countries  $i$  and  $j$  in year  $t$  as follows.

$$P_{fijt} = \beta_1 \text{ Sending country factors}_{it} + \beta_2 \text{ Receiving country factors}_{jt} + \beta_3 \text{ Corridor-specific factors}_{sijt} + \beta_4 \text{ Firm-specific factors}_{fijt} + \varepsilon_{fijt} \quad (5)$$

<sup>3</sup> We use 2018 to maximize the number of observations for cross-sectional regressions.

We run this model both cross-sectionally (for 2018, the year with the largest coverage for fees and explanatory variables) and for the whole sample period, with and without corridor-year fixed effects. While we lag country- and corridor-level variables, we use contemporaneous observations for the firm-level factors. While in the corridor-level regressions we use heteroscedasticity robust standard errors, we cluster standard errors on the corridor level in the firm-level regressions.

## B. Explanatory Variables

Next, we discuss the different variables we use to explain cross-corridor, -firm, and -time variation. Table 1 and Table 2 in the annexes present descriptive statistics and the correlations, respectively (for the cross-sectional sample). We distinguish between different groups of factors that can explain variation across corridors and over time in remittance costs. As the simplest model, one can think of the remittance price consisting of the cost for the service provider and a mark-up. These costs can be driven by operational costs of the provider, but also government policies and restrictions. They might be country- or corridor-specific but can also be firm-specific. Both costs (where firm-specific) and mark-up can also be driven by the market structure and competition each provider faces. Specifically, lower competition reduces the pressure to be as cost-efficient as possible and allows providers to charge higher mark-ups. Unfortunately, not all the variables we discuss in the following are available for all corridors and some are only available for one year. We will therefore run different specifications with different subsamples.

A first group of variables are **socioeconomic characteristics** in the sending and receiving countries as well as corridor-specific factors that might influence fees through their impact on the cost structure of remittance service providers. First, we include GDP per capita. As the cost of services is typically higher in more developed economies, we expect a positive association between GDP per capita and remittance prices. However, higher levels of economic development might also come with higher levels of efficiency, which would lower costs in corridors with higher income in sending and receiving countries. We take GDP per capita from the World Bank's World Development Indicators (WDI). In 2017, GDP per capita ranged from 936 USD in Tanzania to 80,000 USD in Switzerland among sending countries and from 340 USD in Malawi to 19,700 USD in Estonia among receiving countries.

Second, remittance costs might be a function of the **geographic distribution of the population** in sending and receiving country and distance of clients from the nearest remittance service provider. A more sparsely distributed population might be harder to reach, thus raising transaction costs for providers, while also increasing the pricing power of providers, as geographic access is more difficult for senders and recipients of remittances. We therefore include the share of rural population in both sending and receiving country, with data from World Development Indicators. The rural population share ranges from zero in Singapore and Kuwait to 83 percent in Malawi. As robustness test, we replace the rural population share with bank branch penetration per capita. While this is not a direct gauge of geographic penetration of remittance service providers as it only captures banks, we see it as a proxy measure for the ease of geographic access to financial service providers.

Third, we use the bilateral trade volume between sending and receiving country as gauge of **economic integration between both countries**. On the one hand, trade requires frequent payments, and a higher trade volume might thus result in lower costs; on the other hand, a higher trade volume might signal generally deeper and broader relationships, with lower costs as consequence. This variable comes from the World Bank's World Integrated Trade Solution (WITS) and is available for up to 300 corridors over the period 2011 to 2017.<sup>4</sup> It ranges from 412,000 between Nepal and Oman to 683 billion between the US and China in 2018. A second corridor-specific variable is the **geographic distance** between both countries, as measured between the capitals of the respective countries. Unlike in trade, distance might matter less for financial services, but could still influence the extent and ease of remittance transactions. This variable is time-invariant, measured as distance between capitals, and we take data from CEPII. It ranges from 215 km between Austria and Hungary to 17,676 km between Brazil and Japan. As a third corridor-specific variable, we include a proxy for the volume of remittance transactions within corridors, which is the number (bilateral stock) of **migrants residing in the remittance sending country** who are originally from the remittance receiving country. A higher volume reduces not only the costs (assuming a fixed cost element as in most financial services) but also provides space for more providers and thus more competition, resulting in lower costs. This variable comes from the United Nations' International Migrant Stock Database and is available for 124 corridors in 2017.

Fourth, we include factors that affect the ability of providers to increase their mark-up and thus charge higher fees, mostly related to **market structure and competition**. Specifically, we include the number of providers per corridor in the database. In the absence of actual market structure data across corridors, we use this as a crude proxy for the competition in each corridor and the ability of providers to charge mark-ups. In 2017, the number of providers ranges from one in the US-Yemen corridor to 26 in the Australia-India corridor. Second, we include the share of banks among remittance service providers in each corridor. As banks might consider remittances as a marginal product and are less likely to offer competitive prices (Ratha and Riedberg, 2005), we expect a positive correlation between the share of bank respondents and the average price of remittances. In 2017, the share of banks ranged from zero in 139 out of 300 corridors to one in four corridors.

A fifth group of variables are **macroeconomic and regulatory government policies** that can influence the price of remittances through their impact on the cost structure of remittance service providers, including exchange rate policies, capital controls, and regulation of remittance service providers. First, we include a dummy variable for sending and receiving countries with pegged exchanged rates (including cases of currency boards, de facto pegged regimes, and no separate legal tender). Lower exchange rate volatility should be associated with lower prices, by lowering the exchange rate costs and uncertainty faced by providers and, thus, the fees they charge to customers. In our cross-sectional sample for 2018, 15.2 percent of source and 13.4 percent of destination countries have a fixed exchange rate. Second, we expect the price of sending remittances to be higher in countries that impose controls on remittance transactions, since these operate like a tax that is likely to be passed onto recipients. Both the dummy for pegged

---

<sup>4</sup> This limited data span of trade data reduces the overlap of the sample by two years (2019 and 2020).

exchange rate regimes as well as the capital controls dummy come from the International Monetary Fund (IMF) *Annual Report on Exchange Arrangement and Restrictions*. Third, we control for the breadth of regulation of remittance service providers in sending and in receiving countries by creating an index of regulation which can take values from 0 to 5 depending on whether providers must be: (a) registered, (b) licensed, (c) are subject to specific safety and efficiency requirements, (d) need to comply with AML regulations, and/or (e) need to comply with laws and regulations of general applicability. Data to create the indexes come from the *Global Payment Systems Survey 2008*, conducted by the World Bank.<sup>5</sup> While a broader regulatory framework might make the remittance market more transparent and more competitive, greater exposure to regulations can also increase the costs on the regulated institutions, so that the impact is a-priori ambiguous.<sup>6</sup> A higher regulatory burden might reduce the number of service providers, with negative repercussions for competitiveness. Fourth, we include an index of AML risk from the Basel Institute on Governance, which is based on a number of different indicators, including the quality of the AML/CFT framework, corruption risk, financial transparency and standards, public transparency and accountability and legal and political risk. The indicator is scaled between 0 and 10, with higher numbers indicating higher risk.

The correlations in Table 2 in the annexes (for the cross-sectional sample) show a negative and significant correlation of the median remittance price with GDP per capita in both sending and receiving country, with bilateral trade and geographic distance between the two countries, branch penetration in both sending and receiving country, the number of market participants, the number of migrants, and a fixed exchange rate regime in the sending country. We find a positive and significant correlation of the median remittance price with the rural population share in the sending country, the share of banks among market players, the AML index in both sending and receiving country and capital controls in the sending country. However, many of the explanatory variables are also significantly correlated with each other, so that we turn to regression analysis to gauge the statistical and economic significance of different factors.

Finally, we include several firm and product characteristics. On the most basic level, we distinguish between different types of providers. Banks charge typically higher fees, which might be explained by higher regulatory costs faced by banks and remittance services not being the most important product of the larger package of services that clients receive. While higher bank fees might thus reflect a “convenience premium”, post offices have the advantage of being able to cross-subsidize remittance services with their main business and offering easy access given their wide outreach. MTOs, on the other hand, are specialized providers and might thus incur higher costs; international MTOs, however, such as Western Union and Moneygram might benefit from scale economies. Further, regulatory costs are often lower for MTOs, which might reduce their costs. We also explore whether the product characteristics discussed in the previous section are associated with variation in fees. A higher speed in delivery and more convenient access points might come with higher fees. On the other hand, using Internet or mobile phones as

---

<sup>5</sup> The report can be found at: <https://documents.worldbank.org/en/publication/documents-reports/documentdetail/831891468340224062/global-survey-book>

<sup>6</sup> Note that the index does not measure the severity of regulations, but only the scope of the regulatory framework.



access points might reduce costs for the remittance service provider, possibly passed on to clients.

## IV. RESULTS

This section discusses the results of the regressions. We first use medians across corridors and over time, before turning to regressions for subsamples of banks and MTOs, and finishing with firm-level regressions.

### A. Corridor-level Baseline Regressions

The results in Table 3 show country- and corridor-level factors explaining cross-corridor and over-time variation in remittance prices. We present results for (i) a cross-sectional regression for 2018 (columns 1-5), (ii) a pooled panel (columns 6-10), and (iii) a model with country- and year-fixed effects (columns 11-15), the latter two for the period 2011 to 2020. We have data for up to 341 corridors. In the following, we will discuss the results grouped by different variables. The regressions differ not only by econometric specification but in addition to variables in the baseline regressions we add explanatory variables that are available for shorter time periods or fewer countries.

First, customers in richer sending countries face lower remittance costs; this finding holds in most of the cross-sectional and pooled regressions but not once we control for country- and year fixed effects, suggesting that remittance costs do not change with changes in GDP per capita within sending countries over time. There is no consistently significant relationship between the income level of the destination country and remittance costs. In terms of economic magnitude and based on the coefficient estimate in column (1), we find that an increase in one standard deviation in the sending country's GDP per capita is associated with about half a percentage lower remittance fees. In summary, these findings are consistent with the hypothesis of lower efficiency and higher transaction costs in financial service provision in less developed countries.

Second, clients in sending countries with a higher rural population share face higher remittance costs; these results hold in cross-sectional and pooled regressions but lose in significance when controlling for country- and year-fixed effects, suggesting – as in the case of GDP per capita – that remittance costs do not change with the distribution between rural and urban areas within a country. There is a weak negative relationship between the rural population share in the destination country and remittance costs, which enters significantly in some but not all cross-sectional and pooled regressions. The coefficient on the rural population share in destination country turns positive and significant in the regressions with country- and year-fixed effects, suggesting that an increase in rural population in a given destination country over time is associated with increases in remittance costs to this country. In terms of economic magnitude, we find that one standard deviation increase in the rural population share of the sending country is associated with one percentage point higher remittance costs (column 1), while one standard deviation increase in the rural population share of a given destination country over time is associated with a 2.2 percentage points higher remittance costs. In columns (5), (10) and (15), we replace the rural population share with the number of bank branches per capita in sending and destination country; while neither enters significantly in the cross-sectional regressions, they

enter significantly and with a positive (sending country) and negative (receiving country) coefficient in the pooled regression. Given that branch penetration is a positive indicator of access, these findings are the reverse from what we would expect given the coefficient estimates from the rural population shares. In the fixed effects regressions, finally, branch penetration in the sending country enters negatively and significantly (and thus consistent with the rural population share coefficient estimates), while branch penetration in the receiving country does not enter significantly. Together, these findings provide some indirect evidence that easier geographic access to outlets of remittance service providers might be associated with lower remittance costs.

Third, where significant, there is a negative relationship between the trade volume of the two countries within the corridor and remittance costs. While the coefficient estimate is rarely significant in the cross-country and pooled regressions, it is negative and significant at the 1 percent-level in all fixed-effects regressions, suggesting that as countries trade more, remittance costs fall for this specific corridor. An increase of one standard deviation in bilateral trade within a given corridor over time is associated with one percentage point lower remittance fees (column 11). Similarly, we find higher remittance costs in corridors that are further away from each other, pointing to the importance of distance as cost driver. An increase of one standard deviation in distance is associated with 0.6 percentage points higher remittance costs (column 1). Finally, we find that a higher migrant population in a specific corridor is associated with lower remittance costs, with an increase of one standard deviation in migrant population being associated with 1.3 percentage points lower remittance costs (column 2). In summary, a closer geographic, social and economic relationship between countries is associated with lower remittance costs in the corresponding corridor.

Fourth, we find consistent evidence for a negative relationship between the number of market participants in a corridor and remittance costs; this variable enters negatively and significantly (at least at the 10 percent-level) across all regressions. If we infer the degree of competition from the number of market participants in a corridor, this would suggest a price-dampening effect of competition. A standard deviation increase in the number of market participants reduces remittance costs by 0.3 percentage points (column 1). Further, we find a positive and significant relationship between the share of banks among market participants in a corridor and remittance costs; the variable enters significantly (at least at the 10 percent-level) and positively in all regressions, with a one standard deviation increase in the share of banks being associated with 0.7 percentage points higher remittance costs (column 1). While crude indicators of market structure, these results suggest that a larger number of players in the market is associated with lower fees, suggesting higher competitive pressure from more players, but also that (i) banks charge higher fees (as already shown in Figure 6) and/or (ii) a more prominent role for banks in a remittance corridor drives up fees for all providers. We will use subsample regressions for banks and MTOs in Table 5 and 6 and firm-level regressions in Table 9 to distinguish between these different hypotheses.

Table 3. Baseline Results

	Cross-Section 2018	Cross-Section 2018	Cross-Section 2018	Cross-Section 2018	Cross-Section 2018	Pooled	Pooled	Pooled	Pooled	Pooled	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect	Fixed Effect
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ln (GDP per capita) source country	-0.356*	0.00738	-0.515**	-0.251	-0.412**	-0.282***	0.0994	-0.470***	-0.184*	-0.275***	-0.0792	-0.0393	0.102	0.351	0.168
	(0.207)	(0.206)	(0.238)	(0.235)	(0.206)	(0.0879)	(0.0901)	(0.107)	(0.104)	(0.0883)	(0.636)	(0.654)	(0.642)	(0.732)	(0.633)
Ln (GDP per capita) destination country	-0.262	-0.0352	0.281	0.00685	-0.361*	-0.276***	-0.0619	0.303***	-0.0458	-0.304***	0.0688	-0.000641	0.00841	0.0668	0.342
	(0.182)	(0.198)	(0.235)	(0.246)	(0.197)	(0.0813)	(0.0892)	(0.103)	(0.107)	(0.0884)	(0.474)	(0.482)	(0.476)	(0.447)	(0.567)
Rural population share source country	0.0752***	0.0665***	0.0374*	0.0811***		0.0636***	0.0630***	0.0300**	0.0856***		0.172	0.232	0.207	0.108	
	(0.0173)	(0.0166)	(0.0195)	(0.0205)		(0.0109)	(0.0105)	(0.0119)	(0.0123)		(0.145)	(0.147)	(0.146)	(0.185)	
Rural population share destination country	-0.0202*	-0.0125	-0.0166	-0.0320**		-0.00620	9.07e-06	0.000141	-0.0172***		0.116*	0.140**	0.117*	0.208**	
	(0.0105)	(0.0101)	(0.0104)	(0.0131)		(0.00470)	(0.00444)	(0.00503)	(0.00580)		(0.0632)	(0.0653)	(0.0641)	(0.0832)	
Ln (Bilateral trade)	-0.0199	-0.0218	-0.305	-0.0454	0.161	-0.0288	0.0685	-0.294***	-0.0934	-8.93e-05	-0.433***	-0.385***	-0.441***	-0.573***	-0.399***
	(0.166)	(0.174)	(0.188)	(0.204)	(0.189)	(0.0787)	(0.0849)	(0.0814)	(0.0948)	(0.0899)	(0.0690)	(0.0746)	(0.0700)	(0.0714)	(0.0742)
Ln(distance)	0.634**	0.0299	0.487	0.312	0.362	0.762***	0.116	0.538***	0.284*	0.346**	0.434**	0.348*	0.451**	0.291	0.527***
	(0.319)	(0.318)	(0.370)	(0.388)	(0.357)	(0.135)	(0.137)	(0.157)	(0.160)	(0.156)	(0.176)	(0.182)	(0.176)	(0.184)	(0.179)
Share of banks	3.914**	3.907**	4.529***	4.681***	6.972***	7.725***	6.657***	6.177***	6.461***	10.02***	2.228***	2.050***	1.937***	2.327***	2.090***
	(1.656)	(1.659)	(1.587)	(1.765)	(1.916)	(0.636)	(0.629)	(0.660)	(0.697)	(0.678)	(0.489)	(0.489)	(0.489)	(0.529)	(0.494)
Number market participants	-0.0758*	-0.0735*	-0.101*	-0.0949*	-0.120**	-0.0689***	-0.0497**	-0.0906***	-0.0877***	-0.0843***	-0.0924***	-0.0737***	-0.0911***	-0.0919***	-0.0749***
	(0.0447)	(0.0439)	(0.0519)	(0.0505)	(0.0519)	(0.0222)	(0.0224)	(0.0237)	(0.0245)	(0.0240)	(0.0215)	(0.0230)	(0.0215)	(0.0229)	(0.0226)
Ln(Migrants) 2017		-0.819***					-0.970***					-0.332***			
		(0.136)					(0.0600)					(0.0658)			
Regulation index destination country 2008			0.256**					0.0991*							
			(0.126)					(0.0543)							
Regulation index source country 2008			-0.244					-0.184*							
			(0.121)					(0.0996)							
Pegged exchange rate source country			-2.658***					-3.745***						-20.70***	
			(0.549)					(0.253)						(3.610)	
Pegged exchange rate destination country			-0.211					0.529**						-0.107	
			(0.694)					(0.244)						(0.359)	
Capital controls destination country			-0.752**					-0.712***						-0.283	
			(0.366)					(0.183)						(0.315)	
Capital controls source country			7.079***					6.611***						1.151**	
			(1.341)					(0.547)						(0.448)	
AML index destination country				0.771***					0.550***						0.0779
				(0.249)					(0.100)						(0.132)
AML index source country				-0.621*					-1.184***						-0.0406
				(0.348)					(0.185)						(0.201)
Branch penetration source country					0.00319					0.0155***					-0.0506***
					(0.0154)					(0.00575)					(0.0184)
Branch penetration destination country					-0.0313					-0.0394***					0.0162
					(0.0208)					(0.00893)					(0.0190)
Constant	18.14***	16.52**	15.25**	10.11	22.53***	14.93***	13.82***	12.72***	14.19***	19.18***	13.79	13.91	8.501	3.097	13.28
	(6.373)	(6.499)	(7.192)	(7.931)	(6.304)	(2.712)	(2.865)	(3.382)	(3.650)	(2.650)	(19.72)	(20.64)	(19.92)	(24.75)	(19.61)
Observations	341	330	263	278	281	2,160	2,080	1,657	1,789	1,907	2,160	2,080	2,133	1,789	1,907
R-squared	0.192	0.290	0.415	0.268	0.172	0.225	0.316	0.403	0.243	0.228	0.809	0.811	0.809	0.813	0.822

\*, \*\*, \*\*\* indicate significance at the 10 percent, 5 percent and 1 percent level, respectively, based on heteroscedasticity robust standard errors

Fifth, several of our indicators of the regulatory and macroeconomic environment enter significantly. We do not include these variables in the baseline regression, as they are not available for the whole sample and/or the whole sample period. One, our results suggest that broader regulation of remittance service providers in the sending country is associated with higher remittance costs. As we have this variable only for one point in time (2008), we can only include it in the cross-sectional and pooled regressions, where the regulation index for the sending country enters significantly and positively in both regressions, while the regulation index for the receiving country enters negatively in the pooled regression (column 3). Two, we find that if the currency of the sending country is pegged, remittance costs are lower, while we do not find consistent and significant coefficient estimates for the exchange rate regime in the destination country (column 3). Three, we find some evidence that reporting requirements in destination country are associated with lower remittance costs, while such requirements in the source country are associated with higher remittance costs (column 3). Four, higher (lower) AML risk in the sending (receiving) country is associated with higher remittance costs (column 4). In summary, while there is clear evidence that the lower costs pegged exchange rate in the sending country are passed on to customers, the evidence on the impact of the regulatory framework is far from clear, with several coefficient signs counter-intuitive and surprising differences across different models. Any significant relationship could indicate an impact of the regulatory framework on remittance fees, an impact of remittance fees on the regulatory framework or a third factor driving both. We are thus careful in interpreting these findings.

In summary, the strongest predictor of cross-corridor variation in remittance costs are: (i) income per capita and geographic access to financial institutions in the sending country, (ii) economic links between source and destination country, (iii) market structure in the remittance service market and (iv) the exchange rate regime in the sending country. We find lower fees in corridors with sending countries with higher GDP per capita, a lower rural population share and a fixed exchange rate, corridors with stronger trade and migration links and shorter distance, and corridors with more players and fewer banks.

In terms of the explanatory power of our regression models, the R squared varies between 17 percent and 42 percent in the cross-sectional and 23 percent and 40 percent in the pooled regressions, suggesting that our explanatory variables explain less than half of the variation and that other – unobservable – factors are important as well. Turning to the fixed-effect regressions, we find that it is mostly source country and year-fixed effects and less destination country fixed effects that enter significantly. This together with an R squared of above 80 percent suggests important global trends (as documented in Figure 5) and important time-invariant source country characteristics explaining corridor-year-variation in remittance fees.

As our sample contains both advanced and developing countries, we re-run the regressions for a sample of developing destination countries only. Specifically, we drop the corridors where the destination country is a high-income country. Doing so, we lose 8 corridors in the cross-sectional baseline regression and 62 observations in the pooled baseline regressions. As the results in Table 4 show, most results still hold. Specifically, (i) corridors with higher rural population share in the sending country have higher remittance costs, (ii) corridors with higher migration population, higher trade volumes and less distant source and destination countries have lower

remittance costs, (iii) corridors with more market players and a lower share of banks have lower remittance costs and (iv) corridors where the source country has a pegged exchange rate have lower remittance costs. As before, some of the regulatory variables enter significantly, but with different signs for source and destination country and not always consistent across the different specifications.

### **B. Corridor-level Regressions: Banks vs. Money Transfer Operators**

As the data in Tables 3 and 4 include different types of financial institutions, we next present separate regressions for two of the most important types of institutions active in the remittance markets: banks and MTOs. Table 5 presents results with the median remittance price in a corridor computed only across banks for a sample of up to 232 corridors, while Table 6 presents results with the median remittance price in a corridor computed only across MTOs, for a sample of up to 336 corridors.

The results in Table 5 shows that when focusing exclusively on banks, some of the previous results are confirmed while others change. First, both GDP per capita of sending and receiving country are negatively associated with remittance cost, i.e., corridors with richer sending and receiving countries have lower costs, in line with the hypothesis that financial systems in richer countries are more efficient and their costs are thus lower. However, when focusing on within-country variation, both coefficient estimates turn positive and significant, suggesting that as sending and destination countries become richer over time, remittance costs increase, pointing to possible demand-side effects. The relationships between remittance costs and GDP per capita are thus much stronger and more significant when focusing on banks only.

Second, we find evidence that a higher share of rural population in the sending countries is associated with higher remittance costs, although this holds only for the cross-sectional and pooled but not fixed effects regressions. We find a positive and significant relationship between the rural population share in the receiving country and remittance costs in the fixed-effects regressions, suggesting that as the rural population in the destination country of a corridor increases over time, this is associated with higher remittance costs. We find weak evidence (in the pooled regressions only) that branch penetration in both sending and receiving countries are negatively associated with remittance costs. These findings are similar to what we found in the overall sample.

Table 4. Developing to advanced corridors only

	Adv-dev Section 2018	Cross- Section 2018	Adv-dev Section 2018	Cross- Section 2018	Adv-dev Section 2018	Cross- Section 2018	Adv-dev Section 2018	Cross- Section 2018	Adv-dev Section 2018	Cross- Section 2018	Adv-dev Section 2018	Cross- Section 2018	Adv-dev Section 2018	Cross- Section 2018	Adv-dev Section 2018	Cross- Section 2018	Adv-dev Section 2018	Cross- Section 2018	Adv-dev Section 2018	Cross- Section 2018
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15					
Ln (GDP per capita) source country	-0.337 (0.210)	0.0593 (0.208)	-0.499** (0.243)	-0.263 (0.238)	-0.400* (0.209)	-0.276*** (0.0893)	0.142 (0.0912)	-0.474*** (0.108)	-0.180* (0.106)	-0.267*** (0.0892)	0.164 (0.652)	0.232 (0.675)	0.307 (0.663)	0.724 (0.742)	0.646 (0.643)					
Ln (GDP per capita) destination country	-0.260 (0.183)	-0.0171 (0.198)	0.301 (0.241)	-0.0114 (0.249)	-0.360* (0.197)	-0.292*** (0.0824)	-0.0638 (0.0900)	0.287*** (0.106)	-0.0497 (0.109)	-0.320*** (0.0891)	0.00555 (0.652)	-0.0660 (0.476)	-0.0197 (0.483)	0.0458 (0.444)	0.266 (0.569)					
Rural population share source country	0.0755*** (0.0173)	0.0664*** (0.0166)	0.0368* (0.0196)	0.0822*** (0.0210)		0.0645*** (0.0109)	0.0643*** (0.0105)	0.0299** (0.0119)	0.0861*** (0.0125)		0.167 (0.146)	0.226 (0.148)	0.196 (0.147)	0.0949 (0.186)						
Rural population share destination country	-0.0215** (0.0105)	-0.0137 (0.0102)	-0.0171 (0.0105)	-0.0309** (0.0138)		-0.00687 (0.00473)	-0.00104 (0.00447)	0.000326 (0.00506)	-0.0167*** (0.00588)		0.118* (0.0640)	0.142** (0.0664)	0.128** (0.0646)	0.211** (0.0852)						
Ln (Bilateral trade)	-0.0143 (0.166)	-0.0176 (0.174)	-0.313 (0.191)	-0.0311 (0.206)	0.168 (0.189)	-0.0154 (0.0794)	0.0872 (0.0853)	-0.277*** (0.0827)	-0.0891 (0.0959)	0.0126 (0.0904)	-0.417*** (0.0684)	-0.376*** (0.0745)	-0.426*** (0.0694)	-0.550*** (0.0699)	-0.384*** (0.0737)					
Ln(distance)	0.537 (0.332)	-0.152 (0.328)	0.366 (0.389)	0.311 (0.403)	0.264 (0.367)	0.722*** (0.141)	-0.0316 (0.144)	0.499*** (0.164)	0.254 (0.168)	0.299* (0.162)	0.512*** (0.174)	0.416** (0.181)	0.514*** (0.174)	0.377** (0.181)	0.604*** (0.178)					
Share of banks	3.709** (1.669)	3.641** (1.671)	4.358*** (1.613)	4.612** (1.778)	6.783*** (1.927)	7.666*** (0.652)	6.428*** (0.641)	6.177*** (0.679)	6.503*** (0.710)	9.982*** (0.690)	2.193*** (0.489)	2.039*** (0.491)	1.963*** (0.490)	2.320*** (0.527)	2.058*** (0.495)					
Number market participants	-0.0868* (0.0453)	-0.0882** (0.0440)	-0.115** (0.0532)	-0.104** (0.0525)	-0.135** (0.0524)	-0.0733*** (0.0228)	-0.0580** (0.0228)	-0.0974*** (0.0245)	-0.0906*** (0.0253)	-0.0879*** (0.0245)	-0.0766*** (0.0212)	-0.0615*** (0.0227)	-0.0777*** (0.0213)	-0.0787*** (0.0226)	-0.0599*** (0.0223)					
Ln(Migrants) 2017		-0.861*** (0.136)					-1.021*** (0.0605)					-0.309*** (0.0658)								
Regulation index destination country 2008			0.243* (0.138)					0.119** (0.0594)												
Regulation index source country 2008								-0.190* (0.103)												
Pegged exchange rate source country			-2.792*** (0.557)					-3.780*** (0.256)												
Pegged exchange rate destination country								0.520** (0.253)												
Capital controls destination country			-0.850** (0.373)					-0.807*** (0.187)												
Capital controls source country			6.887*** (1.347)					6.525*** (0.548)												
AML index destination country				0.696** (0.297)					0.525*** (0.107)											
AML index source country					-0.593 (0.370)				-1.193*** (0.196)											
Branch penetration source country					0.00592 (0.0152)					0.0169*** (0.00580)										
Branch penetration destination country						-0.0333 (0.0211)				-0.0407*** (0.00903)										
Constant	18.53*** (6.423)	16.81** (6.494)	15.64** (7.337)	11.05 (8.080)	23.01*** (6.349)	15.39*** (2.747)	14.38*** (2.881)	13.41*** (3.437)	14.57*** (3.685)	19.58*** (2.670)	8.379 (19.75)	7.766 (20.75)	2.450 (20.07)	-5.749 (24.52)	2.004 (19.60)					
Observations	333	322	255	270	276	2,098	2,018	1,595	1,734	1,856	2,098	2,018	2,071	1,734	1,856					
R-squared	0.194	0.303	0.418	0.260	0.174	0.224	0.325	0.406	0.240	0.227	0.814	0.815	0.814	0.819	0.827					

\*, \*\*, \*\*\* indicate significance at the 10 percent, 5 percent and 1 percent level, respectively, based on heteroscedasticity robust standard errors

Table 5. Remittance Costs across Corridors – Banks only

	Bank-only Cross-Section 2018	Bank-only Cross-Section 2018	Bank-only Cross-Section 2018	Bank-only Cross-Section 2018	Bank-only Cross-Section 2018	Bank-only Pooled	Bank-only Pooled	Bank-only Pooled	Bank-only Pooled	Bank-only Pooled	Bank-only Fixed Effect	Bank-only Fixed Effect	Bank-only Fixed Effect	Bank-only Fixed Effect	Bank-only Fixed Effect
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ln (GDP per capita) source country	-1.414*** (0.493)	-0.837 (0.554)	-1.569*** (0.566)	-1.197** (0.559)	-1.025** (0.479)	-0.323* (0.191)	0.268 (0.206)	-0.596** (0.232)	-0.0993 (0.225)	0.0634 (0.185)	2.054 (1.376)	2.103 (1.397)	2.251 (1.396)	5.542*** (1.746)	2.940** (1.458)
Ln (GDP per capita) destination country	-1.282*** (0.388)	-0.998** (0.454)	-0.996* (0.549)	-0.833* (0.493)	-1.352*** (0.399)	-1.001*** (0.148)	-0.840*** (0.164)	-0.811*** (0.229)	-0.843*** (0.194)	-1.003*** (0.148)	2.057** (0.953)	2.059** (0.943)	2.109** (0.950)	3.160*** (1.173)	1.576 (0.992)
Rural population share source country	0.156*** (0.0357)	0.137*** (0.0356)	0.131*** (0.0401)	0.168*** (0.0461)		0.0751*** (0.0176)	0.0698*** (0.0166)	0.0631*** (0.0212)	0.0710*** (0.0207)		-0.214 (0.254)	-0.199 (0.258)	-0.221 (0.254)	-0.191 (0.358)	
Rural population share destination country	-0.0148 (0.0258)	-0.00976 (0.0253)	-0.0159 (0.0296)	-0.0435 (0.0319)		0.0141 (0.0105)	0.0149 (0.0100)	0.00304 (0.0121)	-0.0159 (0.0122)		0.387*** (0.147)	0.372** (0.151)	0.378*** (0.146)	0.645*** (0.179)	
Ln (Bilateral trade)	0.991** (0.413)	0.970** (0.424)	0.562 (0.500)	0.775 (0.483)	1.060*** (0.408)	0.571*** (0.155)	0.816*** (0.155)	0.330 (0.201)	0.569*** (0.182)	0.385** (0.156)	-0.886*** (0.179)	-0.786*** (0.188)	-0.791*** (0.178)	-1.240*** (0.204)	-1.025*** (0.193)
Ln(distance)	2.117*** (0.795)	1.297 (0.885)	2.127** (0.983)	1.604* (0.875)	1.665** (0.740)	1.778*** (0.291)	1.049*** (0.305)	1.844*** (0.376)	1.285*** (0.339)	1.408*** (0.273)	-0.990*** (0.366)	-0.984*** (0.369)	-0.803*** (0.363)	-1.549*** (0.398)	-1.113*** (0.387)
Share of banks	-0.221 (3.340)	1.031 (3.309)	0.0564 (3.825)	-0.515 (3.619)	6.778** (3.012)	11.33*** (1.299)	10.77*** (1.243)	10.38*** (1.537)	10.08*** (1.426)	13.99*** (1.214)	0.565 (1.247)	0.210 (1.229)	0.645 (1.246)	1.670 (1.407)	0.611 (1.279)
Number market participants	0.00454 (0.0956)	0.0509 (0.0954)	0.00253 (0.110)	0.00867 (0.100)	0.0294 (0.103)	0.256*** (0.0460)	0.280*** (0.0446)	0.213*** (0.0514)	0.308*** (0.0480)	0.311*** (0.0473)	0.184*** (0.0437)	0.223*** (0.0441)	0.169*** (0.0442)	0.194*** (0.0473)	0.203*** (0.0459)
Ln(Migrants) 2017		-1.123*** (0.266)					-1.488*** (0.115)					-0.594*** (0.140)			
Regulation index destination country 2008			-0.499 (0.313)					-0.185 (0.132)							
Regulation index source country 2008								-0.560*** (0.212)							
Pegged exchange rate source country			-4.204*** (1.299)					-3.894*** (0.549)						-28.10*** (6.497)	
Pegged exchange rate destination country								-1.160** (0.546)						0.795 (0.977)	
Capital controls destination country								1.018** (0.437)						-0.228 (0.520)	
Capital controls source country								5.662*** (0.864)						1.397* (0.764)	
AML index destination country					1.832*** (0.605)				2.097*** (0.242)					0.610* (0.351)	
AML index source country					-0.169 (0.718)				-0.417 (0.328)					0.733 (0.470)	
Branch penetration source country						-0.0519 (0.0450)				-0.0411*** (0.0119)					-0.0421 (0.0359)
Branch penetration destination country						-0.0290 (0.0521)				-0.0624*** (0.0201)					-0.00771 (0.0651)
Constant	47.04*** (13.80)	43.13*** (14.55)	54.57*** (15.96)	27.91 (16.96)	42.77*** (13.78)	14.44*** (5.549)	13.60** (5.861)	23.62*** (7.156)	-1.304 (6.982)	12.38** (5.092)	-66.74 (43.68)	-63.67 (45.07)	-76.61* (44.03)	-195.6*** (55.92)	-62.20 (41.81)
Observations	232	223	180	199	209	1,403	1,337	1,075	1,167	1,318	1,403	1,337	1,384	1,167	1,318
R-squared	0.161	0.227	0.282	0.192	0.100	0.173	0.262	0.250	0.215	0.193	0.762	0.769	0.764	0.780	0.759

\*, \*\*, \*\*\* indicate significance at the 10 percent, 5 percent and 1 percent level, respectively, based on heteroscedasticity robust standard errors

Third, as in the overall sample, there is evidence that a higher trade volume between the countries is associated with lower remittance costs and primarily in the fixed-effects regressions. Surprisingly, in cross-sectional and pooled regressions, this variable often enters positively and significantly. As in the overall sample, higher distance is associated with higher remittance costs, while a higher potential market size for remittances (as proxied by the migrant stock in the corridor) is negatively associated with remittance costs.

Fourth, and different from the results in the overall sample, a larger number of remittance service providers is associated with higher remittance costs (in pooled and fixed effects regressions), while – as before – a higher share of banks in the remittance market is associated with higher remittance costs (in pooled regressions). Banks do thus not react with lower fees to a larger number of competitors, in line with the hypothesis that remittance service constitute marginal business for them.

Fifth, sending countries with pegged exchange rates have lower remittance costs, while sending countries with stronger reporting requirements and destination countries with higher AML risks have higher remittance costs. Some of the other regulatory variables enter significantly in the pooled but not cross-sectional regressions.

Similarly, the regressions in Table 6 show for the subsample of MTOs some similar and some different results from the baseline regressions in Table 3. First, GDP per capita in sending and receiving country is often positively and significantly associated with remittance prices, unlike for banks, although this finding is not consistent. This suggests that – unlike in the banking system – it is not so much efficiency and thus costs that drive fees but rather payment capacity and demand.

Second, there is some evidence that the rural population share in the sending (receiving) country is positively (negatively) and significantly associated with remittance prices; in both cases, this holds primarily in the cross-sectional and pooled but not fixed-effects regressions. Not surprising, the coefficients on the bank branch penetration variables do not enter in any consistent way. The results for the sending country are in line with the findings in the overall sample.

Third, there is strong evidence that a higher trade volume in the corridor is associated with lower remittance costs, while there is no clear relationship with distance (unlike in the overall sample and for banks). A larger migrant population in the corridor, on the other hand, is associated with lower remittance costs.

Fourth, unlike for banks, there is a significant and negative (positive) relationship between remittance costs for MTOs and the number of remittance service providers (share of banks among remittance service providers). This suggests that unlike banks, MTOs react to competitive pressure posed by more market players. The significant and positive coefficient on the share of banks suggest that banks do not only charge higher fees but also through their market share put upward pressure on fees charged by MTOs.



Table 6. Remittance Costs across Corridors – MTOs only

	MTO-only Cross-Section 2018	MTO-only Cross-Section 2018	MTO-only Cross-Section 2018	MTO-only Cross-Section 2018	MTO-only Cross-Section 2018	MTO-only Pooled	MTO-only Pooled	MTO-only Pooled	MTO-only Pooled	MTO-only Pooled	MTO-only Fixed Effect	MTO-only Fixed Effect	MTO-only Fixed Effect	MTO-only Fixed Effect	MTO-only Fixed Effect
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ln (GDP per capita) source country	0.128 (0.142)	0.444*** (0.142)	0.0556 (0.158)	0.226 (0.149)	0.0430 (0.151)	0.109* (0.0660)	0.461*** (0.0678)	0.0718 (0.0793)	0.236*** (0.0756)	0.0476 (0.0720)	-0.0448 (0.577)	-0.197 (0.593)	0.0236 (0.580)	0.157 (0.620)	-0.300 (0.590)
Ln (GDP per capita) destination country	0.00230 (0.141)	0.226 (0.147)	0.465** (0.184)	0.331* (0.179)	-0.0302 (0.155)	0.00170 (0.0683)	0.248*** (0.0734)	0.510*** (0.0872)	0.292*** (0.0847)	0.0159 (0.0752)	0.534 (0.451)	0.408 (0.457)	0.499 (0.453)	0.828** (0.418)	0.767 (0.546)
Rural population share source country	0.0377*** (0.0140)	0.0306** (0.0142)	-0.00261 (0.0142)	0.0544*** (0.0152)		0.0242*** (0.00816)	0.0257*** (0.00837)	-0.0176** (0.00813)	0.0594*** (0.00884)		-0.0638 (0.127)	-0.0535 (0.129)	-0.0515 (0.127)	-0.130 (0.149)	
Rural population share destination country	-0.0180** (0.00769)	-0.0121* (0.00710)	-0.0141* (0.00802)	-0.0208** (0.00967)		-0.0126*** (0.00397)	-0.00787** (0.00360)	-0.00759* (0.00425)	-0.0126*** (0.00482)		0.00669 (0.0567)	0.0154 (0.0583)	0.0162 (0.0583)	0.0362 (0.0728)	
Ln (Bilateral trade)	-0.234* (0.128)	-0.264** (0.130)	-0.457*** (0.151)	-0.319** (0.147)	-0.123 (0.145)	-0.223*** (0.0687)	-0.187*** (0.0718)	-0.483*** (0.0707)	-0.351*** (0.0795)	-0.190** (0.0776)	-0.315*** (0.0665)	-0.241*** (0.0713)	-0.320*** (0.0677)	-0.442*** (0.0691)	-0.259*** (0.0721)
Ln(distance)	0.203 (0.216)	-0.323 (0.213)	-0.0463 (0.243)	-0.290 (0.258)	-0.00142 (0.261)	0.253** (0.109)	-0.345*** (0.106)	-0.116 (0.124)	-0.286** (0.128)	0.0262 (0.134)	0.237 (0.159)	0.201 (0.164)	0.247 (0.159)	0.120 (0.170)	0.385** (0.165)
Share of banks	2.683** (1.101)	2.410** (1.031)	1.799 (1.255)	3.161*** (1.180)	4.049*** (1.184)	5.018*** (0.510)	3.771*** (0.491)	2.797*** (0.561)	3.899*** (0.532)	5.951*** (0.516)	0.143 (0.424)	0.0466 (0.428)	-0.0835 (0.428)	0.290 (0.454)	0.0946 (0.440)
Number market participants	-0.145*** (0.0340)	-0.149*** (0.0336)	-0.162*** (0.0378)	-0.177*** (0.0336)	-0.163*** (0.0386)	-0.175*** (0.0187)	-0.164*** (0.0193)	-0.185*** (0.0206)	-0.201*** (0.0203)	-0.183*** (0.0203)	-0.157*** (0.0215)	-0.141*** (0.0229)	-0.154*** (0.0216)	-0.142*** (0.0233)	-0.135*** (0.0226)
Ln(Migrants) 2017		-0.642*** (0.108)					-0.766*** (0.0508)					-0.215*** (0.0653)			
Regulation index destination country 2008			0.129 (0.0969)					0.0236 (0.0480)							
Regulation index source country 2008			-0.139 (0.185)					-0.0150 (0.0902)							
Pegged exchange rate source country			-2.423*** (0.498)					-3.441*** (0.232)						-13.67*** (3.282)	
Pegged exchange rate destination country			0.482 (0.644)					0.691*** (0.223)						-0.0249 (0.347)	
Capital controls destination country			-0.464 (0.313)					-0.387** (0.158)						-0.140 (0.325)	
Capital controls source country			4.650*** (1.184)					4.352*** (0.459)						0.534 (0.339)	
AML index destination country				0.459** (0.219)					0.116 (0.0875)					-0.0796 (0.119)	
AML index source country				-1.345*** (0.289)					-1.557*** (0.152)					0.215 (0.180)	
Branch penetration source country					0.000103 (0.0136)					0.0146*** (0.00522)					-0.00365 (0.0188)
Branch penetration destination country					-0.00727 (0.0196)					-0.00177 (0.00797)					0.0545*** (0.0189)
Constant	5.525 (4.724)	3.157 (4.789)	2.147 (5.408)	3.275 (6.050)	8.692* (5.020)	5.864*** (2.035)	2.926 (2.158)	1.919 (2.646)	8.019*** (2.763)	7.933*** (2.122)	16.27 (18.32)	23.50 (18.98)	14.00 (18.42)	6.739 (22.83)	13.12 (18.47)
Observations	336	325	260	275	277	2,144	2,064	1,650	1,776	1,894	2,144	2,064	2,117	1,776	1,894
R-squared	0.158	0.269	0.333	0.277	0.126	0.131	0.226	0.299	0.195	0.125	0.739	0.738	0.737	0.747	0.744

\*, \*\*, \*\*\* indicate significance at the 10 percent, 5 percent and 1 percent level, respectively, based on heteroscedasticity robust standard errors

Finally, as in the case of banks, source countries with pegged exchange rates face lower MTO remittance fees, while source countries with more reporting requirements face higher costs. Somewhat surprisingly source countries with higher AML risks face lower remittance costs.

In summary, comparing results between the overall sample and the restricted samples for banks and MTOs only, five findings stand out. First, deeper economic ties (proxied by trade volume) and a larger stock of migrants is negatively associated with remittance fees of both banks and MTOs. Second, higher competition as proxied by number of market players in a given corridor has a dampening effect on fees only for MTOs but not for banks, while a higher share of banks is associated with higher costs both among banks and MTOs, suggesting that banks might be market leaders in setting fee structures. Third, the rural population in source and destination countries are stronger predictors of banks' than for MTOs' remittance costs. Fourth, pegged exchange rates in the sending country are associated with lower remittance costs both for banks and MTOs. Finally, the relationship between income per capita and remittance fees varies between banks and MTOs, with banks charging lower fees in corridors where sending and receiving countries are richer, while MTOs do not necessarily vary fees with income levels or – if at all, charge higher fees in richer sending countries.

In Tables 7 and 8, we go one step further and consider two specific MTOs that are active and for which we have data across a large number of corridors – Western Union in up to 332 corridors and MoneyGram in up to 315 corridors. Focusing on one institution, we can better control for provider-specific unobservable effects, which might help us more accurately estimate the factors predicting variation in remittance costs across corridors and over time.

The results in Tables 7 and 8 for Western Union and MoneyGram provide, first, evidence that a higher GDP per capita in sending or receiving country is associated with higher remittance costs, in line with the results for the MTO subsample regressions in Table 6. While the coefficients enter almost always positively, they are not always significant. Second, the rural population share in the source country is mostly positively associated with remittance costs, though the coefficients do not always enter significant. Surprisingly, where significant, the rural population share in the receiving country enters with a negative coefficient, probably suggesting that these firms can deliver competitive remittance services in rural areas. Again, these findings are in line with those in Table 6. Third, we find evidence that closer economic and geographic linkages (bilateral trade and distance) predict lower remittance costs, although again not significantly across all specifications. A larger migrant population in the corridor, on the other hand, is a strong negative predictor of remittance costs for both institutions. Fourth, a larger number of competitors reduces remittance costs – in the case of MoneyGram, the coefficient enters negatively and significantly across all specifications; in the case of Western Union, it enters negatively but not always significantly across all specifications. Where significant, we also find the share of banks enters positively, suggesting that a higher share of banks in a corridor tends to be associated with higher fees charged by Western Union and MoneyGram. Finally, we find in corridors where the source country has a pegged exchange rate, both providers charge lower fees. Overall, the findings for Western Union and MoneyGram are consistent with our regression results for all MTOs, reported in Table 6.

Table 7. Remittance Costs across Corridors – Western Union

	WU-only Cross-Section 2018	WU-only Cross-Section 2018	WU-only Cross-Section 2018	WU-only Cross-Section 2018	WU-only Cross-Section 2018	WU-only Pooled	WU-only Pooled	WU-only Pooled	WU-only Pooled	WU-only Pooled	WU-only Fixed Effect	WU-only Fixed Effect	WU-only Fixed Effect	WU-only Fixed Effect	WU-only Fixed Effect
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ln (GDP per capita) source country	0.303* (0.180)	0.766*** (0.173)	0.140 (0.216)	0.443** (0.196)	0.182 (0.202)	0.321*** (0.0826)	0.839*** (0.0839)	0.239** (0.0995)	0.474*** (0.0940)	0.245*** (0.0936)	1.572** (0.789)	1.152 (0.814)	1.558** (0.791)	1.899** (0.931)	1.049 (0.820)
Ln (GDP per capita) destination country	0.0712 (0.177)	0.406** (0.176)	0.473** (0.213)	0.438** (0.217)	-0.0189 (0.201)	0.121 (0.0888)	0.508*** (0.0912)	0.714*** (0.112)	0.523*** (0.109)	0.144 (0.0998)	0.764 (0.692)	0.709 (0.699)	0.807 (0.691)	0.583 (0.564)	0.910 (0.833)
Rural population share source country	0.0465** (0.0199)	0.0365* (0.0208)	-0.0169 (0.0242)	0.0600** (0.0235)		0.0275*** (0.0100)	0.0298*** (0.0104)	-0.0204** (0.00942)	0.0694*** (0.0105)		-0.0860 (0.163)	-0.0979 (0.167)	-0.105 (0.165)	0.208 (0.223)	
Rural population share destination country	-0.0129 (0.00965)	-0.00485 (0.00884)	-0.00740 (0.0106)	-0.0105 (0.0126)		-0.0180*** (0.00497)	-0.0128*** (0.00441)	-0.00902* (0.00516)	-0.0127** (0.00550)		0.0209 (0.0809)	0.0295 (0.0824)	0.0240 (0.0823)	0.0119 (0.101)	
Ln (Bilateral trade)	-0.276* (0.166)	-0.325* (0.169)	-0.506*** (0.186)	-0.375* (0.199)	-0.129 (0.196)	-0.413*** (0.0910)	-0.406*** (0.0941)	-0.741*** (0.0943)	-0.631*** (0.107)	-0.384*** (0.106)	-0.546*** (0.0920)	-0.421*** (0.101)	-0.546*** (0.0934)	-0.722*** (0.0936)	-0.457*** (0.0991)
Ln(distance)	0.0433 (0.292)	-0.710** (0.277)	-0.439 (0.336)	-0.470 (0.343)	-0.0904 (0.370)	0.0570 (0.147)	-0.798*** (0.142)	-0.514*** (0.175)	-0.530*** (0.167)	-0.115 (0.186)	0.129 (0.222)	0.0344 (0.216)	0.120 (0.222)	-0.0874 (0.216)	0.294 (0.224)
Share of banks	1.753 (1.348)	1.421 (1.227)	1.855 (1.510)	2.345 (1.440)	3.067** (1.467)	3.318*** (0.598)	1.732*** (0.555)	1.660** (0.666)	2.342*** (0.621)	4.160*** (0.587)	-0.941 (0.575)	-0.806 (0.586)	-1.086* (0.578)	-0.799 (0.583)	-0.429 (0.583)
Number market participants	-0.0293 (0.0514)	-0.0350 (0.0469)	-0.0903 (0.0558)	-0.0778 (0.0572)	-0.0529 (0.0563)	-0.0998*** (0.0227)	-0.0997*** (0.0228)	-0.149*** (0.0244)	-0.149*** (0.0239)	-0.123*** (0.0245)	-0.0860*** (0.0261)	-0.0645** (0.0278)	-0.0832*** (0.0260)	-0.0880*** (0.0285)	-0.0805*** (0.0274)
Ln(Migrants) 2017		-0.910*** (0.143)					-1.003*** (0.0716)					-0.414*** (0.0798)			
Regulation index destination country 2008			0.103 (0.150)					-0.0768 (0.0607)							
Regulation index source country 2008			-0.0652 (0.244)					-0.0580 (0.109)							
Pegged exchange rate source country			-3.793*** (0.767)					-4.641*** (0.292)						-9.601** (3.948)	
Pegged exchange rate destination country			0.166 (0.722)					0.521* (0.275)						-0.264 (0.592)	
Capital controls destination country			-0.347 (0.441)					-0.660*** (0.204)						-0.384 (0.450)	
Capital controls source country			2.953** (1.201)					1.906*** (0.411)						0.779** (0.383)	
AML index destination country				0.346 (0.277)					-0.120 (0.113)					-0.183 (0.169)	
AML index source country				-1.345*** (0.368)					-1.484*** (0.164)					0.785*** (0.251)	
Branch penetration source country					-0.0175 (0.0172)					0.00939 (0.00681)					0.0715*** (0.0268)
Branch penetration destination country					-0.00480 (0.0228)					0.0173* (0.0103)					0.0710*** (0.0256)
Constant	0.809 (5.810)	-3.315 (5.571)	4.080 (7.026)	-2.590 (7.209)	6.217 (6.171)	2.601 (2.484)	-3.169 (2.542)	1.464 (3.320)	3.597 (3.294)	4.315* (2.598)	-26.28 (26.62)	-11.50 (27.85)	-26.51 (26.98)	-41.87 (33.02)	-22.94 (26.65)
Observations	332	321	256	271	274	2,110	2,030	1,618	1,746	1,864	2,110	2,030	2,083	1,746	1,864
R-squared	0.063	0.206	0.206	0.124	0.040	0.065	0.187	0.201	0.123	0.058	0.683	0.682	0.682	0.700	0.695

\*, \*\*, \*\*\* indicate significance at the 10 percent, 5 percent and 1 percent level, respectively, based on heteroscedasticity robust standard errors

Table 8. Remittance Costs across Corridors – Moneygram

	MG-only Cross-Section 2018	MG-only Cross-Section 2018	MG-only Cross-Section 2018	MG-only Cross-Section 2018	MG-only Cross-Section 2018	MG-only Pooled	MG-only Pooled	MG-only Pooled	MG-only Pooled	MG-only Pooled	MG-only Fixed Effect	MG-only Fixed Effect	MG-only Fixed Effect	MG-only Fixed Effect	MG-only Fixed Effect
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ln (GDP per capita) source country	0.322* (0.190)	0.788*** (0.198)	0.232 (0.234)	0.164 (0.220)	0.142 (0.188)	0.331*** (0.0842)	0.811*** (0.0864)	0.241** (0.103)	0.384*** (0.0965)	0.158* (0.0839)	-0.977 (0.747)	-1.096 (0.757)	-0.878 (0.757)	0.173 (0.855)	-1.367* (0.749)
Ln (GDP per capita) destination country	0.179 (0.176)	0.465*** (0.178)	0.792*** (0.235)	0.298 (0.250)	0.0306 (0.190)	0.130 (0.0830)	0.429*** (0.0830)	0.709*** (0.107)	0.407*** (0.0980)	0.0995 (0.0844)	0.499 (0.447)	0.433 (0.440)	0.465 (0.451)	0.873* (0.480)	0.799* (0.475)
Rural population share source country	0.0391* (0.0219)	0.0226 (0.0225)	-0.000736 (0.0262)	0.0902*** (0.0258)		0.0443*** (0.00955)	0.0366*** (0.00987)	0.00895 (0.0110)	0.111*** (0.0102)		-0.0811 (0.156)	0.00373 (0.160)	-0.0752 (0.157)	-0.116 (0.196)	
Rural population share destination country	-0.0240* (0.0127)	-0.0154 (0.0116)	-0.0176 (0.0128)	-0.00984 (0.0150)		-0.0158*** (0.00544)	-0.00816* (0.00489)	-0.00420 (0.00546)	-0.0103* (0.00605)		-0.108 (0.0729)	-0.0687 (0.0759)	-0.116 (0.0750)	0.00307 (0.0994)	
Ln (Bilateral trade)	-0.312* (0.174)	-0.308* (0.165)	-0.717*** (0.213)	-0.255 (0.207)	-0.0470 (0.183)	-0.386*** (0.0833)	-0.291*** (0.0786)	-0.714*** (0.0931)	-0.474*** (0.0871)	-0.249*** (0.0851)	-0.375*** (0.0881)	-0.230** (0.0943)	-0.385*** (0.0884)	-0.462*** (0.0937)	-0.375*** (0.0921)
Ln(distance)	-0.0205 (0.345)	-0.783** (0.333)	-0.659 (0.416)	-0.397 (0.430)	-0.120 (0.372)	0.114 (0.144)	-0.673*** (0.136)	-0.560*** (0.172)	-0.395** (0.171)	-0.159 (0.151)	-0.395* (0.222)	-0.558** (0.228)	-0.409* (0.220)	-0.559** (0.239)	-0.279 (0.227)
Share of banks	-0.0778 (1.353)	-0.736 (1.289)	-1.423 (1.600)	0.298 (1.404)	2.234* (1.352)	1.946*** (0.555)	0.380 (0.525)	-0.784 (0.644)	0.671 (0.565)	3.923*** (0.552)	0.525 (0.488)	0.438 (0.489)	0.377 (0.497)	0.205 (0.520)	0.475 (0.488)
Number market participants	-0.156*** (0.0512)	-0.128** (0.0519)	-0.195*** (0.0568)	-0.248*** (0.0536)	-0.198*** (0.0569)	-0.140*** (0.0215)	-0.101*** (0.0217)	-0.199*** (0.0234)	-0.216*** (0.0234)	-0.172*** (0.0231)	-0.184*** (0.0247)	-0.142*** (0.0258)	-0.182*** (0.0247)	-0.182*** (0.0260)	-0.145*** (0.0244)
Ln(Migrants) 2017		-1.063*** (0.143)					-1.096*** (0.0668)					-0.569*** (0.0870)			
Regulation index destination country 2008			-0.116 (0.149)					-0.122** (0.0584)							
Regulation index source country 2008			-0.111 (0.245)					-0.116 (0.101)							
Pegged exchange rate source country			-4.921*** (0.805)					-5.590*** (0.261)						-12.08*** (3.922)	
Pegged exchange rate destination country			0.861 (0.900)					0.721*** (0.259)						-0.206 (0.434)	
Capital controls destination country			-0.829* (0.488)					-0.421** (0.208)						-0.585* (0.315)	
Capital controls source country			3.537*** (1.306)					2.755*** (0.439)						0.423 (0.337)	
AML index destination country				-0.143 (0.274)					-0.168 (0.105)					0.145 (0.163)	
AML index source country				-2.365*** (0.362)					-2.290*** (0.170)					0.660*** (0.216)	
Branch penetration source country					-0.0309 (0.0194)					0.0127** (0.00647)					0.103*** (0.0231)
Branch penetration destination country					0.0154 (0.0225)					0.0248*** (0.00894)					-0.0188 (0.0225)
Constant	0.613 (6.123)	-1.348 (6.435)	0.910 (7.548)	15.41* (8.554)	6.249 (6.076)	1.136 (2.556)	-2.299 (2.645)	1.467 (3.312)	9.830*** (3.261)	6.138** (2.455)	55.68** (23.06)	59.44** (23.96)	54.71** (23.23)	8.827 (29.97)	47.46** (21.00)
Observations	315	304	241	259	258	1,977	1,906	1,513	1,628	1,733	1,977	1,906	1,955	1,628	1,733
R-squared	0.082	0.233	0.281	0.210	0.081	0.072	0.211	0.267	0.179	0.066	0.733	0.743	0.733	0.734	0.739

\*, \*\*, \*\*\* indicate significance at the 10 percent, 5 percent and 1 percent level, respectively, based on heteroscedasticity robust standard errors

### C. Firm-level Regressions

So far, we have focused on differences between corridors and over time. We now exploit within-corridor variation across different firms. This allows us to not only focus on country and corridor-specific factors, but also exploit the correlation between product and service details and remittance prices; it is important to stress, however, that these relationships do not allow any causal inference, as remittance service providers will determine different product characteristics jointly with the price.

Table 9 presents five different specifications; first, we replicate our previous baseline regression, but clustering standard errors at the corridor level (column 1). We then present two cross-sectional regressions for 2018, one without and one with corridor fixed effects, where in the latter we only include firm- and product-level characteristics, thus focusing on within-corridor variation across different remittance service providers (columns 2 and 3). We rerun these two regressions dropping receiving countries with high-income status (columns 4 and 5). Finally, we present three panel regressions over the whole sample period, one with the previous baseline regression, one without and one with corridor-year fixed effects (columns 6 to 8). Before turning to the discussion on the coefficient estimates on different product characteristics, we note that the country- and corridor-level enter with similar signs and significance as in the previous corridor-level tables.

The results in Table 9 show that banks charge significantly higher and MTOs significantly lower remittance fees than other providers (which include post offices), in line with the descriptive statistics. This result comes on top of higher costs in corridors where banks have a higher market share. In the cross-sectional regressions for 2018, we find that banks have, on average, 1.3 to 1.9 percentage points higher fees and MTOs have, on average, 0.9 to 1.3 percentage points lower fees than other institutions. The coefficient sizes are even larger for banks when we turn to panel regressions over time, while the coefficients for MTOs turn insignificant. We find that fees are generally lowest when transactions are undertaken over the Internet (1.7 to 2.7 percentage points lower), while paying at bank branches is generally more expensive than paying at agents or over the Internet, but significantly cheaper than paying at post offices or other outlets. Quicker delivery of the remittance payment is not necessarily correlated with higher fees; the dummy indicating if payment arrives the same day does not enter significantly at the 5 percent level in any of the regressions. Finally, paying by cash attracts higher fees – in the cross-sectional regressions for 2018, we find such transactions are 0.7 to 0.9 percentage points more expensive.

Table 9. Remittance Costs across Corridors – Firm-level Variation

	Firm-level cross-section	Firm-level cross-section	Firm-level cross-section	Firm-level cross- section developing countries	Firm-level cross- section developing country	Firm-level Fixed Effect	Firm-level Fixed Effect	Firm-level Fixed Effect
	1	2	3	4	5	6	7	8
Ln (GDP per capita) source country	-0.282 (0.176)	-0.182 (0.171)		-0.172 (0.173)		-0.344 (0.760)	0.0661 (0.758)	
Ln (GDP per capita) destination country	-0.406*** (0.153)	-0.380** (0.153)		-0.372** (0.154)		-0.636 (0.494)	-0.423 (0.486)	
Rural population share source country	0.0610*** (0.0148)	0.0569*** (0.0143)		0.0577*** (0.0144)		-0.0877 (0.203)	-0.00851 (0.212)	
Rural population share destination country	-0.0190** (0.00936)	-0.0193** (0.00885)		-0.0199** (0.00888)		0.0162 (0.0698)	0.0211 (0.0679)	
Ln (Bilateral trade)	0.0938 (0.149)	0.0653 (0.147)		0.0578 (0.148)		0.382** (0.166)	0.308* (0.164)	
Ln(distance)	0.558** (0.265)	0.592** (0.258)		0.545** (0.269)		19.12*** (3.059)	19.51*** (3.057)	
Share of banks	5.875*** (1.277)	2.584** (1.258)		2.415* (1.276)		7.631*** (0.776)	3.397*** (0.720)	
Number market participants	-0.0811** (0.0341)	-0.0822** (0.0319)		-0.0859*** (0.0322)		0.00907 (0.0264)	0.0383 (0.0284)	
Bank		1.328** (0.564)	1.745*** (0.541)	1.505*** (0.569)	1.868*** (0.545)		3.710*** (0.498)	3.512*** (0.471)
MTO		-1.031** (0.468)	-1.259*** (0.444)	-0.897* (0.475)	-1.145** (0.451)		-0.258 (0.384)	-0.397 (0.353)
Branch		-1.213* (0.718)	-1.021 (0.770)	-1.340* (0.722)	-1.136 (0.770)		-0.647** (0.294)	-0.567* (0.289)
Agent		-2.157*** (0.412)	-2.679*** (0.471)	-2.247*** (0.415)	-2.762*** (0.475)		0.352 (0.285)	0.339 (0.260)
Internet		-2.376*** (0.395)	-2.690*** (0.429)	-2.391*** (0.398)	-2.719*** (0.432)		-1.739*** (0.294)	-1.695*** (0.245)
Cash payment		0.742** (0.359)	0.892** (0.364)	0.770** (0.364)	0.906** (0.396)		0.235 (0.272)	0.216 (0.247)
Fast transfer		-0.183 (0.246)	0.265 (0.256)	-0.279 (0.247)	0.175 (0.260)		-0.139 (0.234)	-0.315 (0.218)
Constant	18.84*** (5.319)	18.29*** (5.260)	8.974*** (0.521)	18.36*** (5.285)	8.985*** (0.527)	-97.24** (40.31)	-118.1*** (39.81)	21.59*** (0.439)
Observations	3,246	3,246	3,385	3,181	3,320	20,266	20,266	28,072
R-squared	0.131	0.213	0.142	0.217	0.145	0.442	0.517	0.504

\*, \*\*, \*\*\* indicate significance at the 10 percent, 5 percent and 1 percent level, respectively, based on heteroscedasticity robust standard errors, clustered at the corridor level.

## V. CONCLUSIONS

This paper documented variation in remittance fees across corridors, time and products. We show significant variation and overall downward trend in fees, and that both country- and corridor-specific factors can explain variation in fees. Five results stand out: first, higher GDP per capita in the sending countries and easier geographic access to financial institutions (especially for banks) are associated with lower fees. Second, scale economies matter: a larger market for remittances (as proxied by closer economic ties and a larger migrant population) is associated with lower costs as is a shorter distance between sending and receiving countries. Third, the market structure is important: banks charge higher fees than MTOs, but a larger share of banks among remittance service providers is also associated with higher fees charged by MTOs. Unlike banks MTOs' fees react to competitive pressures, with more market players being associated with lower MTO but not bank remittance fees. Fourth, in corridors where the sending country has a pegged exchange rate, both banks and MTOs charge lower fees. Finally, there is some evidence that cash payments attract higher fees, while payments over the Internet lower fees. There are no conclusive results regarding the impact of the regulatory framework. Taking all these results together suggests that structural country factors might prevent a further drop in remittance fees, but that stronger competition, especially from non-bank providers, and digitalization can help reduce remittance costs.

Similarly, exchange rate stability (or better hedging possibilities) might help reduce these costs.

This study relies on a significantly larger and more granular dataset than previous studies, especially Beck and Martinez Peria (2011). Some of the previous findings are confirmed, while others not. As in the original study, we find that higher migration in a corridor, higher competition and easier geographic access to banking services is associated with lower fees. Similarly, their finding that corridors with more banks face higher fees is confirmed in this study with more granular data. As before, pegged exchange rates are associated with lower fees. Unlike Beck and Martinez Peria (2009), we find a negative rather than positive relationship between GDP per capita of sending countries and remittance fees. And even though we use a larger array of regulatory variables, we cannot settle the debate on the relationship between regulatory framework and remittance fees.

While exploring variation across many corridors and providers allows establishing certain patterns and association, there are limitations, however, in terms of identification. This is most striking when it comes to clearly endogenous relationships, most prominently the regulatory framework for the remittance market, where it is a-priori not clear whether high fees in the remittance markets trigger changes in the regulatory framework or the regulatory framework influences fees charged by providers. Studies focusing on exogenous changes in regulation (e.g., due to international pressure on AML-CFT frameworks) might allow to disentangle these relationships.

Table 1. Summary statistics for regression sample

	Obs.	Mean	stdev	Min	Max
Remittance fee	341	6.9	3.6	1.0	23.4
Ln (GDP per capita) source country	341	27.9	1.5	23.9	30.7
Ln (GDP per capita) destination country	341	25.5	2.0	20.0	30.3
Rural population share source country	341	20.9	13.4	0.0	73.0
Rural population share destination country	341	50.9	19.2	9.0	83.1
Ln (Bilateral trade)	341	14.4	2.2	6.0	20.3
Ln(distance)	341	8.1	0.9	5.4	9.8
Branch penetration source country	303	22.2	12.9	4.3	55.1
Branch penetration destination country	315	12.9	9.4	0.4	52.8
Share of banks	341	0.2	0.2	0.0	1.0
Number market participants	341	8.8	4.2	1.0	28.0
Ln(migrants) 2017	330	11.7	1.6	4.8	16.4
Regulation Source country 2008	332	3.7	0.9	0.0	5.0
Regulation destination country 2008	270	3.2	1.5	0.0	5.0
Pegged exchange rate source country	341	0.2	0.4	0.0	1.0
Pegged exchange rate destination country	337	0.1	0.3	0.0	1.0
AML index source country	335	4.9	0.7	3.2	7.4
AML index destination country	282	6.0	1.0	2.7	8.3
Capital controls destination country	337	0.6	0.5	0.0	1.0
Capital controls source country	341	0.1	0.2	0.0	1.0



Table 2. Correlation table

	Remittance fee	Ln (GDP per capita) source country	Ln (GDP per capita) destination country	Rural population share source country	Rural population share destination country	Ln (Bilateral trade)	Ln(distance)	Branch penetration source country	Branch penetration destination country	Share of banks	Number market participants	Ln(migrants) 2017	Regulation destination country 2008	Regulation source country 2008	Pegged exchange rate source country	AML index destination country	AML source country	Pegged exchange rate destination country	Capital controls destination country
Ln (GDP per capita) source country	-0.11*																		
Ln (GDP per capita) destination country	-0.13**	0.0																	
Rural population share source country	0.36***	-0.11**	-0.15***																
Rural population share destination country	0.02	-0.22***	-0.17***	0.14***															
Ln (Bilateral trade)	-0.11**	0.27***	0.67***	0.0	-0.33***														
Ln(distance)	-0.11**	0.39***	0.26***	-0.4***	0.1	-0.07													
Branch penetration source country	-0.13**	0.46***	0.0	-0.1	-0.26***	0.1*	0.34***												
Branch penetration destination country	-0.1*	0.1*	-0.12**	-0.1	-0.32***	0.0028	-0.18***	0.17***											
Share of banks	0.3***	-0.1	0.1	0.53***	0.1	0.15***	-0.22***	-0.24***	0.0										
Number market participants	-0.15***	0.0	0.24***	-0.17***	0.0	0.26***	0.09*	0.14**	0.1	0.0									
Ln(migrants) 2017	-0.36***	0.22***	0.2***	0.0	-0.09*	0.36***	-0.12**	0.0	0.0	0.0	0.13**								
Regulation destination country 2008	0.04	0.1	0.1	0.0	0.0	0.04	0.1	0.0	0.0	0.0	0.14**	-0.01							
Regulation source country 2008	-0.01	-0.1	-0.1	0.0	0.13**	-0.14**	0.08	0.11*	-0.13**	-0.1	0.0	-0.05	-0.03						
Pegged exchange rate source country	-0.28***	-0.46***	0.1	-0.3***	0.17***	-0.23***	-0.09*	-0.41***	-0.11*	-0.17***	-0.14***	0.19***	-0.03	0.0					
AML index destination country	0.25***	0.0	-0.2***	0.15**	0.49***	-0.24***	0.15**	-0.1	-0.5***	0.16***	-0.16***	-0.07	-0.1	0.0	-0.1				
AML source country	0.14**	-0.25***	0.0	0.52***	0.13**	0.047	-0.4***	-0.31***	-0.16***	0.29***	-0.22***	0.16***	0.05	-0.1*	0.23***	0.1			
Pegged exchange rate destination country	-0.02	0.0	-0.36***	0.1	-0.1	-0.28***	-0.09	0.0	0.19***	-0.1	0.0	-0.05	0.12*	0.0	0.1	-0.16***	0.0		
Capital controls destination country	-0.01	-0.11**	0.22***	0.0	0.12**	0.0258	0.14**	0.0	0.12**	0.0	0.1	0.01	0.01	-0.1	0.0	0.0	-0.1	0.06	
Capital controls source country	0.37***	-0.12**	-0.27***	0.24***	0.1	-0.13**	-0.2***	-0.1	-0.21***	0.0	-0.17***	-0.03	-0.18***	0.0	-0.1	0.28***	0.15***	0.28***	0.14**

\*, \*\*, \*\*\* indicate significance at the 10 percent, 5 percent and 1 percent level, respectively.

## Appendix Table. Variables, Definitions and Sources

Variable	Definition	Source
Remittance fee	Remittance fee per 200 (500) US dollars	Remittance Prices Worldwide (World Bank)
Ln (GDP per capita) source country	Log of GDP per capita in sending country	World Development Indicators
Ln (GDP per capita) destination country	Log of GDP per capita in sending country	World Development Indicators
Rural population share source country	Percentage of population living in rural areas in sending country	World Development Indicators
Rural population share destination country	Percentage of population living in rural areas in receiving country	World Development Indicators
Ln (Bilateral trade)	Log of bilateral trade	World Integrated Trade Solution (WITS) - World
Ln(distance)	Log of distance between sending and receiving countries (in km, between the capital cities)	Distances Database (CEPII)
Branch penetration source country	Branches of commercial banks per capita (100,000 adults) in sending country	Database on Access to Financial Services (IMF)
Branch penetration destination country	Branches of commercial banks per capita (100,000 adults) in receiving country	Database on Access to Financial Services (IMF)
Share of banks	percentage of banks among respondents in a corridor and year	authors' calculation, based on Remittance Prices Worldwide (World Bank)
Number market participants	number of respondents in a corridor and year	authors' calculation, based on Remittance Prices Worldwide (World Bank)
Ln(migrants) 2017	Log of the number of migrants in each corridor (by origin and destination), "migrant" being defined as foreign-born population when the data is available, otherwise by country of citizenship	International Migrant Stock Database. Trends in International Migrant Stock: The 2017 revision. (United Nations, Department of Economic and Social Affairs, Population Division)
Regulation Source country 2008	Index of importance of banks in the provision of remittances in the sending country, degree to which central banks consider commercial banks to be significant remittance service providers (higher is more relevant)	World Bank Global Payment Systems Survey (World Bank 2008)
Regulation destination country 2008	Index of importance of banks in the provision of remittances in the receiving country, degree to which central banks consider commercial banks to be significant remittance service providers (higher is more relevant)	World Bank Global Payment Systems Survey (World Bank 2008)
Pegged exchange rate source country	Dummy for pegged exchange rate	Exchange Rate Regime Classification (Ilzetzki, Reinhart, and Rogoff)
Pegged exchange rate destination country	Dummy for pegged exchange rate	Exchange Rate Regime Classification (Ilzetzki, Reinhart, and Rogoff)
AML index source country	Index of AML risk in sending country	Basel Institute on Governance
AML index destination country	Index of AML risk in receiving country	Basel Institute on Governance
Capital controls destination country	Takes the value of 1 if controls on personal capital transactions in the receiving country	Annual Report on Exchange Arrangements and Restrictions (IMF)
Capital controls source country	Takes the value of 1 if controls on personal capital transactions in the sending country	Annual Report on Exchange Arrangements and Restrictions (IMF)
Bank	Dummy if remittance service provider is a bank	Remittance Prices Worldwide (World Bank)
MTO	Dummy if remittance service provider is a money transfer operator	Remittance Prices Worldwide (World Bank)
Branch	Dummy if remittance has to be sent through branch	Remittance Prices Worldwide (World Bank)
Agent	Dummy if remittance can be sent through agent	Remittance Prices Worldwide (World Bank)
Internet	Dummy if remittance can be sent through Internet	Remittance Prices Worldwide (World Bank)
Cash payment	Dummy if remittance payment is done in cash	Remittance Prices Worldwide (World Bank)
Fast transfer	Dummy if payment arrives the same day	Remittance Prices Worldwide (World Bank)

**REFERENCES**

- Aggarwal, Reena, Asli Demirguc-Kunt, and Maria Soledad Martinez Peria (2011). “Do Workers’ Remittances Promote Financial Development?” *Journal of Development Economics* 96, 255-64.
- Aycinena, Diego, Claudia Martinez, and Dean Yang. 2009. “The Impact of Remittance Fees on Remittance Flows: Evidence from a Field Experiment among Salvadoran Migrants.” Department of Economics, University of Michigan, Ann Arbor.
- Anzoategui, Diego, Asli DemirgüçKunt, and Maria Soledad Martínez Pería. 2014. “Remittances and Financial Inclusion: Evidence from El Salvador.” *World Development* 54, 338-49.
- Bazot, Guillaume. 2018. "Financial Consumption and the Cost of Finance: Measuring Financial Efficiency in Europe (1950–2007)," *Journal of the European Economic Association, European Economic Association*, 16, 123-160.
- Beck, Thorsten (2010): FinAccess 2009: Trends, Analysis and Policy Conclusions. Mimeo for FSD Kenya
- Beck, Thorsten, Asli Demirguc-Kunt, and Maria Soledad Martinez Peria. 2008. “Banking Services for Everyone? Barriers to Bank Access and Use around the World”. *World Bank Economic Review* 22, 397–430.
- Beck, Thorsten and Heiko Hesse. 2009. “Why are Interest Spreads so High in Uganda?” *Journal of Development Economics* 88, 192-204.
- Beck Thorsten and Maria Soledad Martinez Peria. 2011. What Explains the Cost of Remittances? An Examination Across 119 Country Corridors”. *World Bank Economic Review* 25,105-131
- Bersch, Julia, Jean François Cleavy, Naseem Muhammad, Esther Pérez Ruiz, and Yorbol Yakhshilikov. 2021. “Fintech Potential for Remittance Transfers: A Central America Perspective”, IMF Working Paper WP/21/175
- Da Silva Filho, Tito Nícias Teixeira. 2021. “No Easy Solution: A Smorgasbord of Factors Drive Remittance Costs”, IMF Working Paper WP/21/199.
- Demirguc-Kunt, Asli and Harry Huizinga (1999). “Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence” *World Bank Economic Review* 13, 379-408.
- Demirguc-Kunt, Asli, Luc Laeven, and Ross Levine. 2004. “Regulations, Market Structure, Institutions, and the Cost of Financial Intermediation.” *Journal of Money, Credit, and Banking* 36, 593–622

Demirguc-Kunt, Asli, Ernesto Lopez Cordova, Maria Soledad Martinez Peria and Christopher Woodruff. 2011. “Remittances and Banking Sector Breadth and Depth: Evidence from Mexico.” *Journal of Development Economics* 95, 229-41.

Freund, Caroline L., and Nikola Spatafora. 2008. “Remittances, Transaction Costs, Determinants, and Informality.” *Journal of Development Economics* 86. 356–66.

Gibson, John, David J. McKenzie, and Halahingano Rohorua. 2006. “How Cost Elastic Are Remittances? Evidence from Tongan Migrants in New Zealand.” *Pacific Economic Bulletin* 21, 112–28.

Kosse, Anneke and Robert Vermeulen. 2014. “Migrants’ Choice of Remittance Channel: Do General Payment Habits Play a Role?” *World Development* 62, 213-37.

Laeven, Luc, and Giovanni Majnoni. 2005. “Does Judicial Efficiency Lower the Cost of Credit?” *Journal of Banking and Finance* 29, 1791–812.

Mbiti, Isaac and David Weil (2011) *Mobile Banking: The Impact of M-Pesa in Kenya*. NBER Working Paper 17129.

OECD (Organisation for Economic Co-operation and Development). 2010. *Database on Immigrants and Expatriates*. OECD, Paris. <http://stats.oecd.org/Index.aspx?lang=en#>.

Orozco, Manuel. 2006. “International Flows of Remittances: Cost, Competition and Financial Access in Latin America and the Caribbean—Toward an Industry Scorecard.” *Inter-American Dialogue*, Washington, DC.

Philippon, Thomas. 2015. *Has the U.S. Finance Industry Become Less Efficient? On the Theory and Measurement of Financial Intermediation*. *American Economic Review* 105, 1408-38.

Philippon, Thomas. 2018. *The FinTech Opportunity*. Mimeo

Ratha, Dilip, and Jan Riedberg. 2005. “On Reducing Remittance Costs.” *Development Prospects Group*. World Bank, Washington, DC.

World Bank 2008. *Payment Systems Worldwide, a Snapshot: Outcomes of the Global Payment Systems Survey 2008*. Washington, DC: World Bank.



# PUBLICATIONS

What Explains Remittance Fees? Panel Evidence  
Working Paper No. WP/2022/063