Remittances, costs, corridors

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Abstract

The paper attempts to better understand the mechanisms underlying the costs of remittances. It does so using a multi-country analysis over the 2010s. More specifically, It tries to highlight whether and how the operators on the market adjust to a shock in the demand for remittances. To address endogneity as well as severe measurement errors, I propose to use the climatic disasters that occurred in the country receiving remittances as an instrument. It appears that, overall, a demand shock on the market of remittances does push up costs up to a delay of 1 or 2 quarters. On the other hand, the catastrophe contemporaneously impacts the remittances.

Keywords: Remitttances, Costs, Corridors, Catastrophe

1. Introduction

Remittances are well-known to be a major flow of capital and accounts for a large share of the GDP in several countries such as Kyrgyzstan, Tajikistan, Salvador, Nepal, *etc.* Whether remittances is beneficial towards the macroeconomic development and the microeconomic situation of households has occupied a rich literature so far. Both approaches do not always seem to be in line with each other: remittances can bring a risk of *Dutch disease* (see for example Acosta *et al.* [1] in 2009 or Chatterjee *et al.* [2] in 2018) but also have a positive impact on financial development (see Azizi 2020 [3]), on growth provided that the financial system is sufficiently integrated (see Giuliano and Ruiz-Arranz in 2009 [4]) or provided that the institutions are sufficiently strong and stable (see Catrinescu *et al.* in 2009 [5]).

On the other hand, remittances at the micro level have demonstrated that it can be helpful to thwart poverty (Adams [6] in 2005), potentially spend in productive investments (Adams and Cuecuecha [7] in 2010), entrepreneurship (Murard [8] in 2016 or Vadean *et al.* [9] in 2019), women inclusion (Amuedo

and Pozo [10] in 2006 or Lokshin and Glinshaya [11] in 2009), more socially committed implications (Nikolova [12] in 2017) or a higher self-reported well-being (Ivlevs *et al.* [13] in 2019). In any cases, transferring money to the family left behind or anyone else is costly.

Those costs sometimes appear to be extremely high and might prevent migrants from remitting as frequently as desired. A better understanding of the costs drivers might be helpful to further push them down. Indeed, one of the G20 commitment settles that the global average of the cost of remittances should fall below 5%.

The present article has the ambition to better understand the cost structure of the remittances by analyzing the effects of demand shocks: several increases in demand for remittances from the source country. An obvious concern is the reverse causality of most of the shocks hence the use here of environmental catastrophes that can arguably be considered as exogenous.

2. Remittances costs and the literature

A variety of determinants. The costs of remittances are manifold, driven by the volatility of the exchange rate, the size of the diaspora, the type of the migration (permanent *versus* temporary; family-based migration, working migration, etc), the financial deepening of the source country, the magnitude of the competition between actors within a corridor.

The literature indicates that the costs of remittances widely vary across corridors, the most established being usually the cheapest. Depending on the service delivered, costs widely change: the total cost of an immediate transfer is about XXX the one of the 2 to 5 days transfer. The access point also contribute to determine the costs: local agent or direct access will therefore differ in terms of the extra charges.

The market structure. The usual actors of money transfers are: Money Transfer Operators (MTO), banks, and postal banks. The recent years witness an increase of online platforms (TransferWise as an example among others) that might push down prices by increasing the competition and the substitutability of services, provided that both sides of the remittances flow have an online access.

- Monopoly: Koksal *et al.* explore remittances from Germany to Turkey [14] and attest that Turkish bank hold a monopolistic *status quo*

- Competition intensity tends to decrease costs (see Orozco in 2002 [15] in the case of Latin Countries towards the US).
- By offering new channels of remitting, will the FinTech developments modify the nature of the market by introducing more competition? La Cava and Naatus (2020 [16]) assess the potential impact it will have on remittances. It is interesting to notice that some countries already put strong regulations on crypto-remittances (China) but it should be stressed that the overall expected impact is hard to estimate and that clearly is a key aspect the already well-furnished World Bank data on the price of remittances can enrich in the future.
- Yang [17] advocates that policy regulation can have a strong leverage on limiting the costs of remittances through bolstering tougher competition and better informing the remitters about the different channels they have in hands.

Costs-Remittances elasticity. In the case of remittances sent from New Zealand to Tonga, Gibson *et al.* [18] analyze the elasticity between costs and remittances and find that it has a magnitude of -0.22 between all the remittances senders, but the effects is about three times larger for those who decide to change the amount remitted. This important conclusion stresses the problematic of the competition structure as one could expect a price competition *à la* Bertrand when the amount remitted does respond to costs. Aycinena *et al.* [19] estimate the change in remittances sent when the costs is reduced: a $ 1 costs reduction leads to a $ 25 increase in remittances sent. More recently and on a macro scale, Ahmed *et al.* in 2020 [20] show that a 1% reduction in the costs of remittances induces a 1.6% increase in remittances.

Previous work. Given its relevance to better understand but also shape the structure of the costs of remittances studies about remittances costs are surprisingly scarce. Freund and Spatafora [21] in 2008 provide a frame to analyze remittances along with their costs. They find that costs of remittances paid by the remitters are a function of financial depth, the stock of migrants, the stability of the currency compared to the dollar. Beck and Peria in 2011 [22] pursue the analysis and show that bank participation along with MTOs has an impact in reducing the costs of remittances. The larger the number of actors the lower the price - so that competition matters to reduce prices. They also highlight that the results vary across the types of firms (mostly

banks and MTOs) so that the pricing of both structure might be driven by different reasons.

Ahmed *et al.* in 2020 [20] investigate the impact of remittances costs on the magnitude of remittances with the use of a gravity equation. They try to deal with endogeneity and use several instruments to proxy the costs of remittances. It appears to be a difficult challenge and it seems that their instruments are rather weakly related to the costs of remittances (given the low value of the Wid-stat).

3. Theoretical intuitions

It seems that the cost of remittances fit somewhere between the cost of other financial flows that are more prone to a price equalization as investors might not be constrained by the destination point. On the other hand, traded goods might suffer from this constraint as settling new trading partners appear to be costly. Remittances suffer from this very similar constraint but magnified till the extreme: either the migrant remit to the source country, or s/he doesn't[1].

Given the number of actors, monopolistic competition seems to be a match here. Substitutability of the service is a function of the number of actors, of the number of different types of transfers each offer in terms of length, accesspoints, etc.

- Economic environment:
  - *Actors.* Migrants and their families seeking to transfer money (large number of customers). Banks and MTOs providing the service (a small number of providers *per corridor*).
  - *Information.* The customer does not know the cost function of each providers but can reasonably compare the prices (through the internet, at least for MTOs).
- Primitives
  - Structure of the supply? A limited number of quite distinct actors. They often offer different types of products (speed of transfer, accesspoint).

[1]There is the exception of the associations promoting a globalised Polyanian understanding of remittances, but this clearly is an outlier so far.

  - Structure of the demand? Might vary according to prices (not clear). Melitz and Ottaviano: non CES preferences leading to endogenous mark-ups. HAVE A CLOSER LOOK!
  - *Technology.* The production is assumed to have increasing returns to scale with a fixed cost and a variable cost.

- Exogenous variables
  - Corridor's elasticity of substitution: If remitting from the US to Mexico becomes more expensive, I won't rather remit to, say, Bolivia.
  - Demand shocks: arguably unexpected so no change in the number of providers but rather the need for (urgent) remittances. A disaster cannot be expected and implies urgent need thus quite inelastic.

- Decision variables
  - *Profit maximization* with free entry and free exit condition (but a fixed cost at entry).
  - Customers try to remit at their desired level, which is a function of "emergency".

- Equilibrium solution
  - Nash equilibrium in a monopolistic competition setting.

4. Data

Remittances Transaction Costs - RPW data. The remittances costs are mustered by the World Bank database: Remittance Price Worldwide for the first quarter of 2011 onward. The data was enriched over time form a sample of 29 and 88 host and source countries in the first quarter of 2011 to 48 and 105 countries, respectively, in the second quarter of 2019. The number of corridors rose from 199 to 367. The host countries usually are the Western countries though not only: few African, Latin American and South-Asian countries are also included. This data offers a rich set of information about the cost of remitting $ 200 with different firms and potentially different timing. One can visualize the groups of senders and receivers in the figure (4).

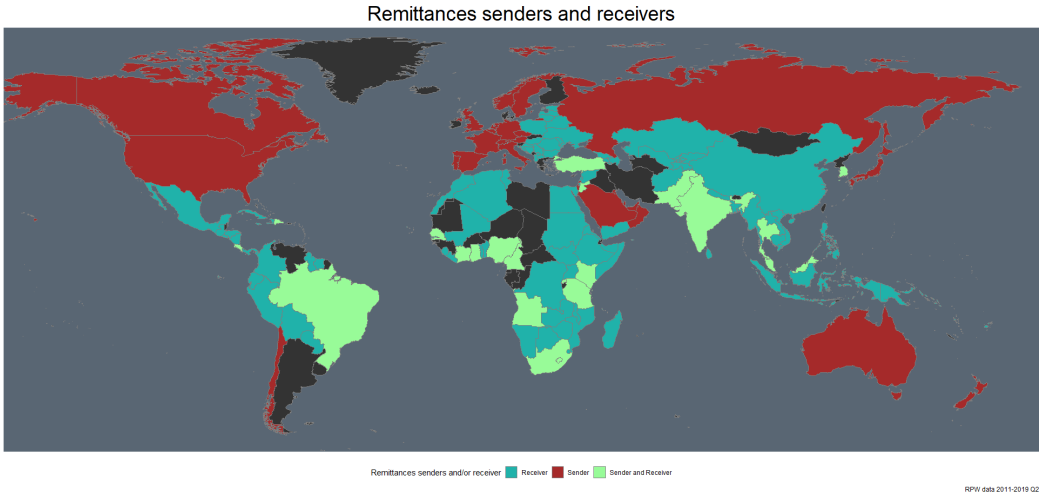

Figure 1: Distribution of the countries sending, receiving remittances

A map displaying the corridor and their relative strengths is provided in Appendix A.1. The senders are in the Western world, Russia, Chile and few middle East countries. Northern American countries have links with Latin America, South East Asia and a few sub-Saharian Africa. Oceania's countries are linked with the surrounding islands, South East Asia and some countries in Southern Eastern Africa. Russian corridors have former USSR block countries, middle East receiving countries are Southern Asia and close African countries. European sourced remittances are mostly headed to former colonies. The map attests the variety of both senders and receivers in terms of geographic location, political, historical and cultural contexts. The median amount of remittances providers per corridors is 15 (see Appendix A.2 for some more details).

The cost of remittances have decreased over time. The global average cost of sending \$500 has decreased from 5.42 to 4.52 % [2]. The pattern for the \$ 200 transfers is similar (a reduction from around 9% to 6.84%)[3]. It appears that this downward trend is globally shared by the different host countries with few exceptions such as Brazil. Within the G20 countries, there is a large

[2]September report RPW over the \$ 500 transfers
[3]September report RPW over the \$ 200 transfers

variation in the average costs with South Africa having the most expensive and the Russian Federation the lowest costs (beyond 15% and below 2% respectively for a transfer of $ 200).

The data focuses on some source countries and some host countries that very rarely overlap. However, one might wonder whether the cost on one way is similar to the cost on the reverted way. It appears that the data offer results to this question for two corridors only: Rwanda-Kenya and Tanzania-Kenya. It appears that, in those two very specific cases the mean comparison test fail to reject an equal mean.

Bilateral remittances. The World Bank gathers data about yearly bilateral remittances. I am using here the remittances for the years 2011-2018[4].

Yearly bilateral remittances are readily available on the World Bank. The data suffer from two main caveats: (i) some corridor might be very roughly estimated and thus lead to severe measurement errors; (ii) the data is at best yearly. This latter aspect raises a problem as it can be that a disaster will dramatically push up the demand for remitting instantaneously. Then, the change would occur in a shorter time frame than a year. Moreover, it is likely that a migrant remitting more in emergency might afterwards reduce the flow of remittances sent for various reasons (*e.g.* liquidity constraints.) This would imply that the yearly remittances can remain stable overall due to a post-disaster reduction of remittances. Yearly remittances data prevent from having more refined quarters fixed effects.

Quarterly personal transfers received. Another possibility is to use the Balance of Payment (BoP) for each country and use the personal transfers (credit) in the current account (see, for example, Alfieri *et al.* in 2005 [23] or Reinke in 2007 [24]). Again, this method has severe drawbacks: (i) it only looks at the country-specific flows and not the corridor-specific so one cannot disentangle the corridors with the highest impacts. (ii) There is a large number of missing data[5].

Lastly, both data suffers for a common measurement error: none of these can account the substitutability between official stream of remittances and

[4]For the most recent years and for some dyads this is a mere estimation, which is then likely to be too conservator with respect to possible catastrophes or breaks in the magnitudes of remittances.

[5]As an example, data from a country as large and integrated to the international flows of capital as the USA does not display the data through the database.

non formal ones (*e.g.* in-kinds goods sent or brought over a temporary return.) Those data are regularly available on LSMS datasets, which therefore calls for some more micro-based analyses to complement the type of study performed here, and to potentially understand the missing bridge (see Clemens and McKenzie in 2018 [25] or Gibson *et al.* [26]).

Aware of those issues, I used the quarterly inflows in the plain text and provide the results of the equivalent specifications in the appendix.

EmDat[6]. Disaster data are collected in the EmDat base by the university of Louvain. It has details about the day(s) of the event, the type of disaster (environment-based such as flood, drought, volcano eruptions, or human-based such as transport or industrial accidents). I compute the total length of each disaster and I aggregate the total people impacted (injured and casualties). Over the period of interest here, there are 1131 disasters that were reported on the EmDat concerning the source country for which I can match the cost of remittances.

In order to give sense of the disasters over the remittances-receiving countries, figure (4) displays the number of reported disasters and the yearly mean share of affected population. Most populated countries such as China, India, Indonesia, Pakistan or Mexico have the highest number of reported disasters.

Overall, it appears that the remittances receiving countries are heterogeneous in terms of disasters prevalence. It should be noted, however, that the two figures do not catch the variability within the countries and the periods that would be the key of the present paper.

Other. Cepii: geodesic distance, common language and colonial past shared inside the corridor? The World Development Indicators database provides yearly country-level variables used here such as the population, the GDP per capita, the share of the rural population.

5. Remittances and Costs

A first important relationship to analyze concerns the remittances and the costs. Do the costs increase along with remittances or, conversely, do they decrease with more remittances? One could argue that, with increasing marginal costs it should rather increase. On the other hand, with increasing

[6]https://www.emdat.be/

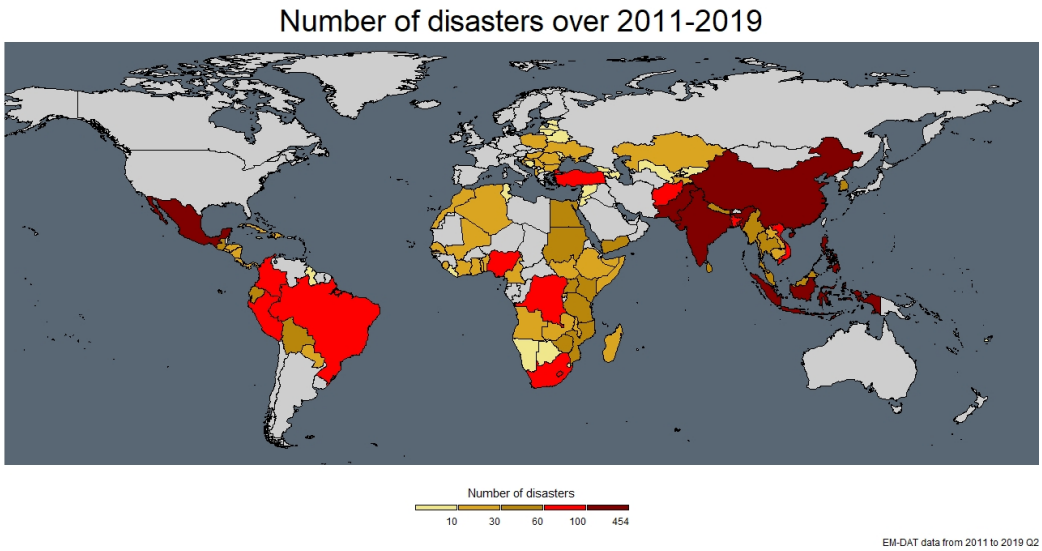

Figure 2: Count of disasters per receiving countries

returns to scale as in a monopolistic competition setting the costs born by the migrants and their families should rather be lower.

To scrutinize the nature of the relationship, I simply apply the following:

$$costs_{ijt} = \alpha_{ij} + \nu_t + \gamma costs_{ijt-1} + \sum_{m=0}^{p} \kappa_{t-m} Remittances_{jt-m} + \delta X_{ijt} + u_{ijt} \quad (1)$$

with i and j denoting the host and the source countries, t denoting the timing, here quarters of years.

Table (1) displays the naive results using the remittances directly to estimate the costs of remittances. Though not statistically significant, one can notice that the contemporaneous and the first lag (so a quarter before) remittances inflows systematically have positive signs. Older remittances have negative signs, again not significant. An appreciation of the receiving country's currency corresponds to higher transaction costs, which can imply that the currency change is partly channeled to the transaction costs. Lastly, the lagged value of the remittance costs have a large explanatory power on the costs the period after even when a rich set of fixed effects (the year or the quarter, the corridor, the speed of the transfer, the access point, the type of

firm operating the transfer), which obviously captures most of the variation, is included.

	(1) Transaction Costs % b/se	(2) Transaction Costs % b/se	(3) Transaction Costs % b/se	(4) Transaction Costs % b/se	(5) Transaction Costs % b/se	(6) Transaction Costs % b/se	(7) Transaction Costs % b/se	(8) Transaction Costs % b/se
Lag 1 Transaction Costs %				0.256265***	0.25578***	0.251793***		0.247649***
				(0.026)	(0.025)	(0.025)		(0.025)
Remittances Inflows	0.000019			0.000015			0.000012	0.000030
	(0.000)			(0.000)			(0.000)	(0.000)
Lag 1 Remittances Inflows		0.000021			0.000004		0.000051	0.000032
		(0.000)			(0.000)		(0.000)	(0.000)
Lag 2 Remittances Inflows			-0.000013			-0.000030	-0.000065	-0.000082
			(0.000)			(0.000)	(0.000)	(0.000)
GDP of Sending Country	-0.000000**	-0.000000**	-0.000000**	-0.000000**	-0.000000**	-0.000000**	-0.000000**	-0.000000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP of Receiving Country	0.000000	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Population of Sending Country	0.014494	0.014814	0.014459	0.010358	0.010172	0.010391	0.014757	0.010123
	(0.020)	(0.020)	(0.020)	(0.018)	(0.018)	(0.018)	(0.020)	(0.018)
Population of Receiving Country	-0.004120	-0.004229	-0.002327	0.000895	0.001635	0.003531	-0.003294	0.002056
	(0.004)	(0.004)	(0.006)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)
Exchange Rate of Receiving (versus $)	0.000141*	0.000140*	0.000150*	0.000152**	0.000153**	0.000158**	0.000148*	0.000158**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Exchange Rate of Sending (versus $)	-0.000447	-0.000448	-0.000477	-0.000886	-0.000893	-0.000918	-0.000456	-0.000904
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Quarters FE	Yes	Yes	Yes	Yes	Yes	Yes		
Corridors FE	Yes	Yes	Yes	Yes	Yes	Yes		
Firms types FE	Yes	Yes	Yes	Yes	Yes	Yes		
Transfer speed FE	Yes	Yes	Yes	Yes	Yes	Yes		
Access point FE	Yes	Yes	Yes	Yes	Yes	Yes		
N	6.43e+04	6.40e+04	6.37e+04	5.03e+04	5.02e+04	5.00e+04	6.34e+04	4.97e+04
r2	0.904325	0.904675	0.904679	0.915257	0.915293	0.915362	0.905172	0.915351

* p0.10, ** p0.05, *** p0.01

Table 1: Transaction Costs and Remittances

6. Disaster and Remittances

Are disasters and remittances related in practice? It seems natural to believe that, for altruistic remittances, disasters in the source country will push the remittances stream up.

Both data sources for remittances - the World Bank yearly bilateral flows and the IMF quarterly personal transfers - have worrisome flaws but there are hopes that comparable results on both can suggest that the effect of disasters on the demand for remittances follows a specific pattern. In both databases, I kept the data measurements in millions of dollars.

Link between disaster and remittances. Simple linear correlations between the disaster's impacts and the remittances have positive signs for disasters having occurred. Unsurprisingly, it appears that the magnitude of the linear correlation is much larger with the use of the quarterly country-specific data (above one third) than with the yearly country-specific data (about 10%). This is confirmed when running regressions including few controls (GDPs of both countries, share of rural population, population in the country of migration, the exchange rate of each country *vis-à-vis* the dollar and it's change over two quarters), and the fixed effects. It allows to catch most of the variability and therefore makes it even more striking that a catastrophe does increase the remittances. Again the effect seems to be positive but is

unclear in the case if yearly bilateral remittances. The caveats highlighted above can at least partly explain a dampening of the effect. On the other hand, the more frequent non-bilateral data displays a coefficient higher in both magnitude and statistical significance.

$$remittances_{ijt} = \alpha_{ij} + \gamma_t + \sum_i \nu_{ti} Disaster_{jt-i} + costs_{ijt-1} + \delta X_{ij} + u_{ijt} \quad (2)$$

with i and j denoting the host and the source countries, t denoting the timing, here years. I also include lags of disasters in order to control for the persistence of the disasters' impacts.

A disaster seems to have an effect in the short run only and that the sign (though not statistically significant) is reverted after a quarter of 2. This is is line with the idea that the yearly remittances can only poorly catch the effect of a demand shock.

Results can be found in table(2). This is the first stage regression and it is reassuring about the relevance of the set of instruments: even with the large spectrum of fixed effects, the disasters indeed impact the remittances. More interestingly (with the exception of the lag 2 remittances), a disaster contemporaneously impacts remittances in the sense that it contributes to push remittances up. On the other hand, one can notice that one quarter later the remittances are lower. This is intuitive since the migrant hurries to send more remittances when most needed and then reduces the amount remitted to smooth it over time.

Lastly, one can notice that the lagged costs does not seem to impact the amount of remittances once all the fixed effects are included. That is an important result as it implies a very inelastic demand on the remittances market.

Disasters as instrument. Equipped with those results, it seems natural to argue that disasters can have an impact on costs through remittances. The first stage control for potential other channels, mostly the exchange rate itself. The exogneity of the instrument seems quite obvious - especially for the lagged values - and will be comforted when looking at the Jansen J stat statistic. The relevance also appears to be satisfactory: the first stage highlights that even when controlling with several variables and partialling out a large share of the variance through the fixed effects, there is still a large impact of past and contemporaneous disasters on the amount of remittances received.

	(1) Remittances Inflows b/se	(2) Lag 1 Remittances Inflows b/se	(3) Lag 2 Remittances Inflows b/se	(4) Remittances Inflows b/se	(5) Lag 1 Remittances Inflows b/se	(6) Lag 2 Remittances Inflows b/se
Lag 1 Transaction Costs %				0.077589	1.143780	-0.705516
				(1.391)	(2.155)	(1.760)
Deads or Affected	1.718416***			2.125671***		
	(0.144)			(0.165)		
Lag 1 Deads or Affected	-0.480885*	1.322010***		-0.115020	1.527718***	
	(0.250)	(0.153)		(0.187)	(0.174)	
Lag 2 Deads or Affected		-1.434864***	-0.571846***		-1.287041***	-0.464447***
		(0.236)	(0.140)		(0.229)	(0.134)
Lag 3 Deads or Affected			-1.191440***			-1.236084***
			(0.346)			(0.403)
GDP of Sending Country	0.000181**	0.000229***	0.000238***	0.000141	0.000207***	0.000248***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP of Receiving Country	-0.001156***	-0.001043***	-0.001066***	-0.001231***	-0.001153***	-0.000943***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Population of Sending Country	-1.64e+01	-1.62e+01*	-1.12e+01**	-1.28e+01	-2.03e+01*	-1.62e+01**
	(12.490)	(9.628)	(5.157)	(15.328)	(12.043)	(6.720)
Population of Receiving Country	73.163805***	67.467729***	66.299658***	75.254078***	76.623546***	65.361861***
	(2.384)	(3.672)	(3.559)	(2.190)	(3.273)	(3.849)
Exchange Rate of Receiving (versus $)	0.080833***	0.109888***	0.087251***	0.086024***	0.113305***	0.110841***
	(0.023)	(0.025)	(0.026)	(0.032)	(0.037)	(0.036)
Exchange Rate of Sending (versus $)	-0.826895*	-0.642060**	-0.465081*	-0.811389**	-0.586034***	-0.492181**
	(0.461)	(0.301)	(0.278)	(0.403)	(0.220)	(0.220)
Quarters FE	Yes	Yes	Yes	Yes	Yes	Yes
Corridors FE	Yes	Yes	Yes	Yes	Yes	Yes
Firms types FE	Yes	Yes	Yes	Yes	Yes	Yes
Transfer speed FE	Yes	Yes	Yes	Yes	Yes	Yes
Access point FE	Yes	Yes	Yes	Yes	Yes	Yes
N	6.43e+04	6.40e+04	6.37e+04	5.03e+04	5.02e+04	5.00e+04
r2	0.993319	0.993235	0.995409	0.993227	0.992928	0.995540

* p0.10, ** p0.05, *** p0.01

Table 2: First Stage

7. Disasters, Remittances and Remittance Costs

7.1. Baseline

Now the idea is to look at whether catastrophes in the source country potentially modifies the cost the firms will charge through their impacts in the remittances. The usual model to apply is the two stage least squares but the estimation can suffer from heteroskedasticity and clustering. Therefore, I run a Hausman test between GMM and 2SLS and it appears that GMM is the efficient choice.

$$costs_{ijt} = \alpha_{ij} + \nu_t - \gamma costs_{ijt-m} + \sum_i \kappa_{t-i} \hat{Remittances}_{jt-i} + \delta X_{ijt} + u_{ijt} \quad (3)$$

The results are displayed in table (3). Controlling by the costs during the previous quarter does not seem to impact the magnitudes nor the significance of the coefficients of the instrumented remittances. The contemporaneous impact is negative. This can be puzzling. It is not easy, though, within the quarter to know when the highest amount of remittances was sent and when the disasters occurred. The disasters could have occurred in the end of the quarter, and thus the measure loses its interpretation. More importantly, the remittances a quarter or two before have a strong positive linear impact on the costs of remittances. The banks and the MTOs adapt their costs according to the observed demand the previous period.

	(1) Transaction Costs % b/se	(2) Transaction Costs % b/se	(3) Transaction Costs % b/se	(4) Transaction Costs % b/se	(5) Transaction Costs % b/se	(6) Transaction Costs % b/se
Lag 1 Transaction Costs %				0.249565***	0.245299***	0.245315***
				(0.024)	(0.024)	(0.024)
Remittances Inflows	-0.000366***			-0.000365***		
	(0.000)			(0.000)		
Lag 1 Remittances Inflows		0.000295***			0.000361***	
		(0.000)			(0.000)	
Lag 2 Remittances Inflows			0.001056***			0.001002***
			(0.000)			(0.000)
GDP of Sending Country	-0.000000**	-0.000000***	-0.000001***	-0.000000*	-0.000000***	-0.000001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP of Receiving Country	-0.000000***	0.000000***	0.000001***	-0.000001***	0.000001***	0.000001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Population of Sending Country	0.014846	0.018627	0.024656	0.008051	0.018352	0.026840
	(0.019)	(0.021)	(0.020)	(0.017)	(0.018)	(0.018)
Population of Receiving Country	0.023925***	-0.022606***	-0.073041***	0.033245***	-0.025101***	-0.062985***
	(0.007)	(0.004)	(0.007)	(0.004)	(0.005)	(0.007)
Exchange Rate of Receiving (versus $)	0.000178**	0.000114	0.000060	0.000180**	0.000117	0.000046
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Exchange Rate of Sending (versus $)	-0.000550	-0.000301	-0.000075	-0.001197	-0.000760	-0.000564
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Quarters FE	Yes	Yes	Yes	Yes	Yes	Yes
Corridors FE	Yes	Yes	Yes	Yes	Yes	Yes
Firms types FE	Yes	Yes	Yes	Yes	Yes	Yes
Transfer speed FE	Yes	Yes	Yes	Yes	Yes	Yes
Access point FE	Yes	Yes	Yes	Yes	Yes	Yes
N	6.43e+04	6.40e+04	6.37e+04	5.03e+04	5.02e+04	5.00e+04
Hansen J statistic	1.304063	1.556123	0.690672	1.406067	1.464776	0.759675
p-value of Hansen J statistic	0.253472	0.212234	0.405936	0.235710	0.226172	0.383430
F statistic for weak identification (KP rk)	75.191264	37.854658	18.605402	1.38e+02	39.647526	9.448077

* p¡0.10, ** p¡0.05, *** p¡0.01

Table 3: Transaction Costs, Disasters and Remittances

7.2. Differential effects

Banks versus MTOs. When the sample is split between the two main categories of transfers actors, one can notice a different pattern: MTOs tends to be more reactive towards demand shock while it takes some more time for the banks. In both cases the impact does not seem to last more than a quarter, hence the need for data available at that frequency.

Splitting the sample between two types of remittances providers: banks and money transfer operators[7], one can see the heterogeneity of the effects only when the lagged costs is taken into account. The results depicted in tables (4) and (5) highlight that the MTOs are more prone to adapt their prices to a demand shock than a bank which certainly has other activities than remittances. Therefore, the banks can be slower at adapting its transaction costs than the MTOs and this is observed on the aforementioned tables. Indeed, the remittance shock appears to be effective in changing the transaction costs after two quarters while the change occurs after only one quarter in the case of MTOs.

[7]The banks and MTOs represent the lion's share of the type of institutions. I gathered few different appellations into those two categories defined by RPW. The defined as bank any structure first called "bank" or "credit union". Money transfer operators muster the other structures such as post offices, non-bank financial institutions.

	(1) Transaction Costs % b/se	(2) Transaction Costs % b/se	(3) Transaction Costs % b/se	(4) Transaction Costs % b/se	(5) Transaction Costs % b/se	(6) Transaction Costs % b/se
Lag 1 Transaction Costs %				0.378839***	0.385581***	0.379840***
				(0.044)	(0.045)	(0.047)
Remittances Inflows	-0.000460***			-0.001309***		
	(0.000)			(0.000)		
Lag 1 Remittances Inflows		0.000217***			0.000058	
		(0.000)			(0.000)	
Lag 2 Remittances Inflows			0.000271***			0.000415*
			(0.000)			(0.000)
Quarters FE	Yes	Yes	Yes	Yes	Yes	Yes
Corridors FE	Yes	Yes	Yes	Yes	Yes	Yes
Firms types FE	Yes	Yes	Yes	Yes	Yes	Yes
Transfer speed FE	Yes	Yes	Yes	Yes	Yes	Yes
Access point FE	Yes	Yes	Yes	Yes	Yes	Yes
N	1.42e+04	1.41e+04	1.40e+04	1.10e+04	1.09e+04	1.08e+04
Hansen J statistic	0.823054	1.073650	1.221219	0.729928	0.928692	0.482119
p-value of Hansen J statistic	0.364289	0.300122	0.269122	0.392906	0.335203	0.487464
F statistic for weak identification (KP rk)	62.279556	10.022717	26.999774	1.81e+02	12.054259	16.475688

* p¡0.10, ** p¡0.05, *** p¡0.01

Table 4: Second stage for banks only

	(1) Transaction Costs % b/se	(2) Transaction Costs % b/se	(3) Transaction Costs % b/se	(4) Transaction Costs ¿ % b/se	(5) Transaction Costs % b/se	(6) Transaction Costs % b/se
Lag 1 Transaction Costs %				0.171963***	0.170407***	0.176298***
				(0.018)	(0.018)	(0.018)
Remittances Inflows	-0.000229***			-0.000126***		
	(0.000)			(0.000)		
Lag 1 Remittances Inflows		0.000195***			0.000216***	
		(0.000)			(0.000)	
Lag 2 Remittances Inflows			0.001159***			0.001117***
			(0.000)			(0.000)
Quarters FE	Yes	Yes	Yes	Yes	Yes	Yes
Corridors FE	Yes	Yes	Yes	Yes	Yes	Yes
Firms types FE	Yes	Yes	Yes	Yes	Yes	Yes
Transfer speed FE	Yes	Yes	Yes	Yes	Yes	Yes
Access point FE	Yes	Yes	Yes	Yes	Yes	Yes
N	5.01e+04	4.99e+04	4.97e+04	3.93e+04	3.92e+04	3.91e+04
Hansen J statistic	0.103782	0.886213	0.000993	0.446452	1.649801	0.841832
p-value of Hansen J statistic	0.747337	0.346506	0.974862	0.504025	0.198986	0.358873
F statistic for weak identification (KP rk)	81.581260	55.528135	18.935740	1.28e+02	72.114837	10.284743

* p¡0.10, ** p¡0.05, *** p¡0.01

Table 5: Second stage for MTOs only

Geography and History.

8. Robustness

FUTURE WORK...

8.1. What about a supply shock?

Use the diaspora.
Use the debit and net flows of IMF-BOP data.

8.2. What is political disasters?

Use Uppsala data, else?

9. Conclusion

The costs of remittances seems to be positively impacted by a push of demand characterized in the present study by an environmental disaster. The effect usually appears after a quarter or two. Among the providers, MTOs seem to adapt more and faster to a shock in remittances' demand. To my knowledge, this is a first attempt to analyze how the transaction costs of remittances change according to a demand shift.

References

[1] P. A. Acosta, E. K. Lartey, F. S. Mandelman, Remittances and the dutch disease, Journal of international economics 79 (2009) 102–116.

[2] S. Chatterjee, S. J. Turnovsky, Remittances and the informal economy, Journal of Development Economics 133 (2018) 66–83.

[3] S. Azizi, Impacts of remittances on financial development, Journal of Economic Studies (2020).

[4] P. Giuliano, M. Ruiz-Arranz, Remittances, financial development, and growth, Journal of Development Economics 90 (2009) 144–152.

[5] N. Catrinescu, M. Leon-Ledesma, M. Piracha, B. Quillin, Remittances, institutions, and economic growth, World Development 37 (2009) 81–92.

[6] R. H. Adams Jr, J. Page, Do international migration and remittances reduce poverty in developing countries?, World development 33 (2005) 1645–1669.

[7] R. H. Adams Jr, A. Cuecuecha, Remittances, household expenditure and investment in guatemala, World Development 38 (2010) 1626–1641.

[8] E. Murard, Consumption and leisure: The welfare impact of migration on family left behind (2016).

[9] F. Vadean, T. Randazzo, M. Piracha, Remittances, labour supply and activity of household members left-behind, The Journal of Development Studies 55 (2019) 278–293.

[10] C. Amuedo-Dorantes, S. Pozo, Migration, remittances, and male and female employment patterns, American Economic Review 96 (2006) 222–226.

[11] M. Lokshin, E. Glinskaya, The effect of male migration on employment patterns of women in nepal, The World Bank Economic Review 23 (2009) 481–507.

[12] M. Nikolova, M. Roman, K. F. Zimmermann, Left behind but doing good? civic engagement in two post-socialist countries, Journal of Comparative Economics 45 (2017) 658–684.

[13] A. Ivlevs, M. Nikolova, C. Graham, Emigration, remittances, and the subjective well-being of those staying behind, Journal of Population Economics 32 (2019) 113–151.

[14] E. Köksal, T. Liebig, Principal channels and costs of remittances: The case of turkey, Migration, Remittances and Development (2005) 103–122.

[15] M. Orozco, Attracting remittances: Market, money and reduced costs, Technical Report, Working paper commissioned by the Inter-American Development Bank . . . , 2002.

[16] A. La Cava, M. K. Naatus, Disrupting business as usual: Blockchain startups in the international remittance market, International Journal of Innovation in the Digital Economy (IJIDE) 11 (2020) 47–54.

[17] D. Yang, Migrant remittances, Journal of Economic perspectives 25 (2011) 129–52.

[18] J. Gibson, D. McKenzie, H. T. S. Rohorua, How cost elastic are remittances? estimates from tongan migrants in new zealand (2006).

[19] D. Aycinena, C. Martinez, D. Yang, The impact of remittance fees on remittance flows: Evidence from a field experiment among salvadoran migrants, Report, University of Michigan.[1672] (2010).

[20] J. Ahmed, M. Mughal, I. Martínez-Zarzoso, Sending money home: Transaction cost and remittances to developing countries, Technical Report, cege Discussion Papers, 2020.

[21] C. Freund, N. Spatafora, Remittances, transaction costs, and informality, Journal of development economics 86 (2008) 356–366.

[22] T. Beck, M. S. Martínez Pería, What explains the price of remittances? an examination across 119 country corridors, The World Bank Economic Review 25 (2011) 105–131.

[23] A. Alfieri, I. Havinga, V. Hvidsten, Issue paper: Definition of remittances and relevant bpm5 flows, United Nations department of economic and social affairs: February (2005).

[24] J. Reinke, et al., Remittances in the balance of payments framework: Current problems and forthcoming improvements, in: Presentation to Seminar on Remittance Statistics at the Center of Excellence in Finance, Ljubljana, Slovenia. imf. org/external/np/sta/bop/pdf/rem. pdf.

[25] M. A. Clemens, D. McKenzie, Why don't remittances appear to affect growth?, The Economic Journal 128 (2018) F179–F209.

[26] J. Gibson, D. McKenzie, S. Stillman, The impacts of international migration on remaining household members: omnibus results from a migration lottery program, Review of Economics and Statistics 93 (2011) 1297–1318.

Appendix A. Data

Appendix A.1. The corridors worldwide

The figure here simply add the different corridors in the database on the map 4. The corridors are split by the amount of remittances sent, the with edges are the corridors with less remittances sent (in absolute terms), the dark edges corresponds to the highest amount of remittances. One can point out that the sending countries are gathering a large amount of corridors - the US, Canada, Australia and New-Zealand, a few European countries, the Russian Federation, and the Arabic peninsula.

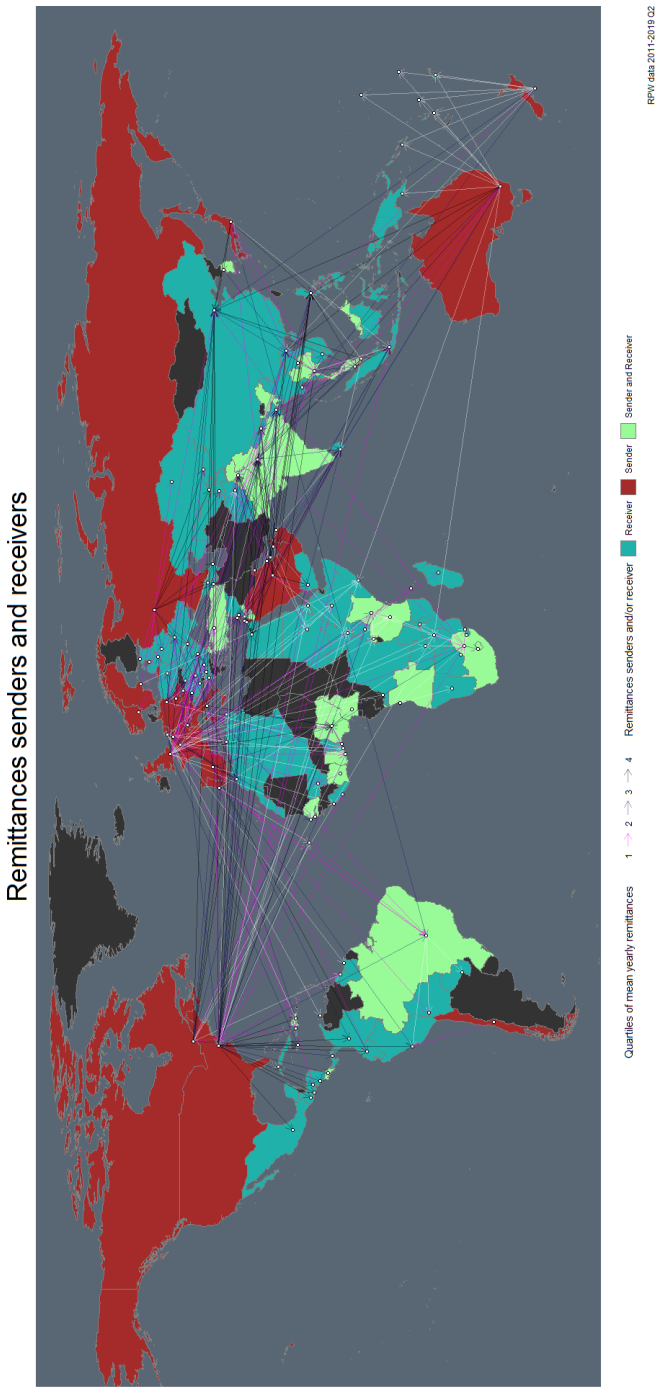

Figure A.3: Corridors in the RPW data

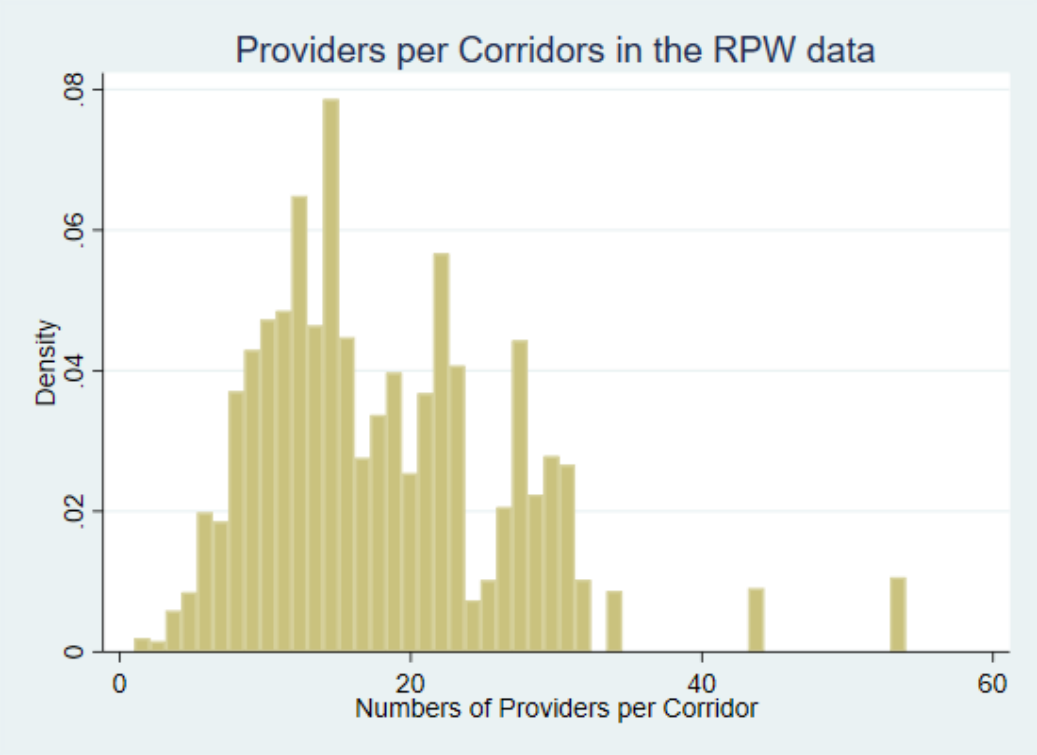

Figure A.4: Amount of Providers

Appendix A.2. The amount of providers

One can easily notice that a minority of countries have very few different providers. There are 8 corridors with one or two providers only that were reported in the RPW data: Germany-Afghanistan, Nigeria-Benin, Nigeria-Mali, Saudi Arabia-Myanmar, Saudi Arabia–South Sudan, Saudi Arabia-Sudan, Saudi Arabia-Syrian Arab Republic, United Arab Emirates-South Sudan. On the other side of the distribution, there are two corridors with more than 40 providers reported in the database: Australia-India and Australia-Philippines.

Appendix B. Yearly Remittances

	(1) Transaction Costs % b/se	(2) Transaction Costs % b/se	(3) Transaction Costs % b/se	(4) Transaction Costs % b/se	(5) Transaction Costs % b/se	(6) Transaction Costs % b/se
Lag 1 Transaction Costs %				0.373983***	0.373730***	0.375264***
				(0.030)	(0.030)	(0.030)
Yearly Bilateral Remittances	-0.000039			-0.000107		
	(0.000)			(0.000)		
Lag 1 Yearly Bilateral Remittances		0.000122			-0.000134	
		(0.000)			(0.000)	
Lag 2 Yearly Bilateral Remittances			0.000002			-0.000205
			(0.000)			(0.000)
GDP of Sending Country	-0.000000	-0.000000*	-0.000000	0.000000	0.000000	0.000000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP of Receiving Country	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Population of Sending Country	0.035091	0.033388	0.000504	-0.008900	-0.009104	0.004163
	(0.044)	(0.044)	(0.044)	(0.103)	(0.103)	(0.104)
Population of Receiving Country	-0.008501**	-0.009300***	-0.013656***	0.001274	0.001777	-0.002522
	(0.003)	(0.004)	(0.004)	(0.010)	(0.010)	(0.011)
Exchange Rate of Receiving (versus $)	-0.000082	-0.000067	-0.000059	-0.000007	0.000003	-0.000031
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Exchange Rate of Sending (versus $)	0.001086	0.001155*	0.000684	0.000783	0.000763	0.000801
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Corridors FE	Yes	Yes	Yes	Yes	Yes	Yes
Firms types FE	Yes	Yes	Yes	Yes	Yes	Yes
Transfer speed FE	Yes	Yes	Yes	Yes	Yes	Yes
Access point FE	Yes	Yes	Yes	Yes	Yes	Yes
N	2.75e+04	2.75e+04	2.53e+04	1.30e+04	1.30e+04	1.30e+04
r2	0.919357	0.919373	0.927623	0.945373	0.945327	0.945448

* p¡0.10, ** p¡0.05, *** p¡0.01

Table B.6: Transaction Costs and Remittances

	(1) Yearly Bilateral Remittances b/se	(2) Lag 1 Yearly Bilateral Remittances b/se	(3) Lag 2 Yearly Bilateral Remittances b/se	(4) Yearly Bilateral Remittances b/se	(5) Lag 1 Yearly Bilateral Remittances b/se	(6) Lag 2 Yearly Bilateral Remittances b/se
Lag 1 Transaction Costs %				1.341480	-0.292112	0.640408
				(2.575)	(1.349)	(2.095)
Deads or Affected	-0.341426			-0.526651*		
	(0.276)			(0.280)		
Lag 1 Deads or Affected	-0.660316			-5.707959**		
	(1.272)			(2.202)		
Lag 2 Deads or Affected	0.931302**			4.367027		
	(0.404)			(2.745)		
Lag 3 Deads or Affected	-0.992942*			-8.692604***		
	(0.530)			(1.987)		
Lag 4 Deads or Affected	-2.058660***	-0.570996**		-3.480438***	-0.303479	
	(0.423)	(0.255)		(0.559)	(0.399)	
Lag 5 Deads or Affected	-0.770243***	1.220442***		-1.36e+01***	-5.123301	
	(0.221)	(0.253)		(3.252)	(3.399)	
Lag 6 Deads or Affected	-1.023802	1.310692***		-5.511653	0.115495	
	(0.653)	(0.270)		(5.723)	(4.252)	
Lag 7 Deads or Affected	-1.184305**	1.708877***		-6.179757***	0.362707	
	(0.529)	(0.466)		(1.678)	(0.948)	
Lag 8 Deads or Affected		-0.303612***	0.689903***		0.031550	1.282641***
		(0.101)	(0.028)		(0.349)	(0.240)
Lag 9 Deads or Affected		-0.778619	0.520455		-9.645291**	-0.114924
		(0.754)	(0.327)		(4.040)	(2.690)
Lag 10 Deads or Affected		-1.317703	0.628563		0.438772	6.452943***
		(1.006)	(0.785)		(0.782)	(2.443)
GDP of Sending Country	0.000551**	0.000420**	0.000171	0.000494	0.000548***	0.000061
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP of Receiving Country	-0.000031	0.000021	0.000179***	-0.000382*	-0.000014	0.000505***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Population of Sending Country	-0.544879	10.962842	30.298072*	-5.080014	-0.887012	58.646930**
	(10.720)	(12.094)	(16.809)	(16.000)	(10.164)	(28.579)
Population of Receiving Country	13.845804***	12.332201***	0.475059	33.399814***	19.220469***	-3.000567
	(4.579)	(3.949)	(3.523)	(7.873)	(7.166)	(5.502)
Exchange Rate of Receiving (versus $)	-0.044641	-0.131017*	-0.237032***	-0.141647***	-0.018981	-0.191068**
	(0.049)	(0.073)	(0.078)	(0.041)	(0.046)	(0.090)
Exchange Rate of Sending (versus $)	-0.636621	-0.397076	0.090946	-0.375199	-0.444970	-0.125537
	(0.431)	(0.268)	(0.232)	(0.291)	(0.288)	(0.213)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Corridors FE	Yes	Yes	Yes	Yes	Yes	Yes
Firms types FE	Yes	Yes	Yes	Yes	Yes	Yes
Transfer speed FE	Yes	Yes	Yes	Yes	Yes	Yes
Access point FE	Yes	Yes	Yes	Yes	Yes	Yes
N	2.76e+04	2.75e+04	2.53e+04	1.30e+04	1.30e+04	1.30e+04
r2	0.991996	0.994371	0.993770	0.993670	0.997711	0.994412

* p¡0.10, ** p¡0.05, *** p¡0.01

Table B.7: First Stage

	(1) Transaction Costs % b/se	(2) Transaction Costs % b/se	(3) Transaction Costs % b/se	(4) Transaction Costs % b/se	(5) Transaction Costs % b/se	(6) Transaction Costs % b/se
Lag 1 Transaction Costs %		0.370714***	0.370042***	0.371612***	0.370714***	0.370042***
		(0.025)	(0.030)	(0.026)	(0.025)	(0.030)
Yearly Bilateral Remittances	0.000033			-0.000321***		
	(0.000)			(0.000)		
Lag 1 Yearly Bilateral Remittances		0.001092***			0.001092***	
		(0.000)			(0.000)	
Lag 2 Yearly Bilateral Remittances			0.001168***			0.001168***
			(0.000)			(0.000)
GDP of Sending Country	-0.000001***	-0.000001	0.000000	0.000001	-0.000001	0.000000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
GDP of Receiving Country	0.000000***	-0.000000	-0.000000	0.000000*	-0.000000	-0.000000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Population of Sending Country	0.054296	0.002972	-0.087150	-0.045467	0.002972	-0.087150
	(0.038)	(0.095)	(0.110)	(0.090)	(0.095)	(0.110)
Population of Receiving Country	-0.012023***	-0.013859***	0.007966	0.001184	-0.013859***	0.007966
	(0.001)	(0.003)	(0.010)	(0.002)	(0.003)	(0.010)
Exchange Rate of Receiving (versus)	-0.000062	0.000036	0.000208	-0.000012	0.000036	0.000208
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Exchange Rate of Sending (versus)	0.001323**	0.001434**	0.001251*	0.001213*	0.001434**	0.001251*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Corridors FE	Yes	Yes	Yes	Yes	Yes	Yes
Firms types FE	Yes	Yes	Yes	Yes	Yes	Yes
Transfer speed FE	Yes	Yes	Yes	Yes	Yes	Yes
Access point FE	Yes	Yes	Yes	Yes	Yes	Yes
N	2.75e+04	1.30e+04	1.30e+04	1.30e+04	1.30e+04	1.30e+04
Hansen J statistic	5.569949	3.173357	1.980000	8.314471	3.173357	1.980000
p-value of Hansen J statistic	0.590761	0.786795	0.371577	0.305683	0.786795	0.371577
F statistic for weak identification (KP rk)	3.34e+04	5.15e+02	10.815120	4.91e+03	5.15e+02	10.815120

* p¡0.10, ** p¡0.05, *** p¡0.01

Table B.8: Second stage GMM

Appendix C. Disasters and Remitances

The figure (Appendix C) simply illustrates the impact of disasters on remittances for an arbitrary set of countries.

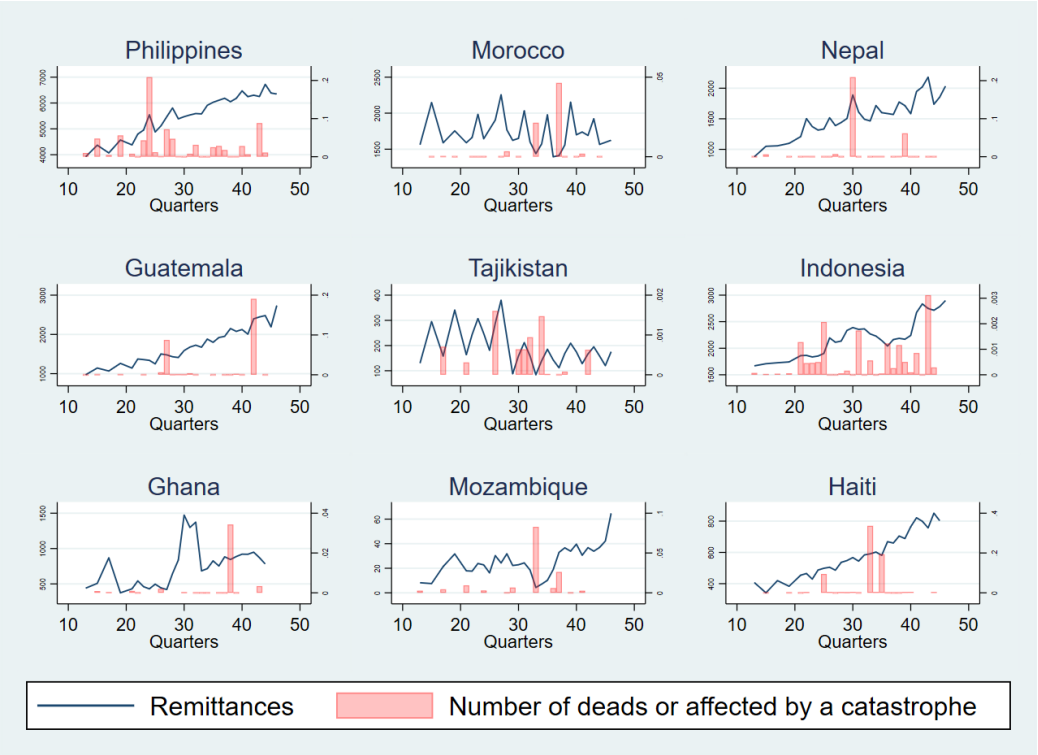

Figure C.5: Disasters and Remittancess

Appendix D. Feb-March work

Appendix D.1. Remittances and Costs

For credit IMF data

	(1) total cost of the transaction in percentage b/se	(2) total cost of the transaction in percentage b/se	(3) total cost of the transaction in percentage b/se	(4) total cost of the transaction in percentage b/se	(5) total cost of the transaction in percentage b/se	(6) total cost of the transaction in percentage b/se	(7) total cost of the transaction in percentage b/se	(8) total cost of the transaction in percentage b/se	(9) total cost of the transaction in percentage b/se	(10) total cost of the transaction in percentage b/se
credit_personal_transfers_lag0	0.00011* (0.000)									0.00013 (0.000)
GDP_cst_dol year	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)
GDP_cst_dol year	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)
tot_pop year	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)
tot_pop year	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)
EX_RATE_destination	0.00038*** (0.000)	0.00038*** (0.000)	0.00039*** (0.000)	0.00040*** (0.000)	0.00043*** (0.000)	0.00042*** (0.000)	0.00041*** (0.000)	0.00043*** (0.000)	0.00043*** (0.000)	0.00045*** (0.000)
EX_RATE_source	-0.00606*** (0.001)	-0.00611*** (0.001)	-0.00612*** (0.001)	-0.00614*** (0.001)	-0.00617*** (0.001)	-0.00616*** (0.001)	-0.00613*** (0.001)	-0.00618*** (0.001)	-0.00613*** (0.001)	-0.00602*** (0.001)
credit_personal_transfers_lag1		0.00010* (0.000)								-0.00001 (0.000)
credit_personal_transfers_lag2			0.00012* (0.000)							0.00002 (0.000)
credit_personal_transfers_lag3				0.00012 (0.000)						-0.00010** (0.000)
credit_personal_transfers_lag4					0.00013* (0.000)					-0.00003 (0.000)
credit_personal_transfers_lag5						0.00014* (0.000)				0.00012 (0.000)
credit_personal_transfers_lag6							0.00013** (0.000)			0.00007 (0.000)
credit_personal_transfers_lag7								0.00010 (0.000)		0.00003 (0.000)
credit_personal_transfers_lag8									0.00009 (0.000)	0.00001 (0.000)
N	6.52e+04	6.49e+04	6.46e+04	6.42e+04	6.38e+04	6.35e+04	6.31e+04	6.26e+04	6.21e+04	6.08e+04
r2	0.50161	0.50224	0.50258	0.50302	0.50343	0.50412	0.50385	0.50423	0.50410	0.50698

* p¡0.10, ** p¡0.05, *** p¡0.01

Table D.9: For credit IMF data

For debit IMF data

	(1) total cost of the transaction in percentage b/se	(2) total cost of the transaction in percentage b/se	(3) total cost of the transaction in percentage b/se	(4) total cost of the transaction in percentage b/se	(5) total cost of the transaction in percentage b/se	(6) total cost of the transaction in percentage b/se	(7) total cost of the transaction in percentage b/se	(8) total cost of the transaction in percentage b/se	(9) total cost of the transaction in percentage b/se	(10) total cost of the transaction in percentage b/se
debit_personal_transfers_lag0	0.00021 (0.000)									-0.00033 (0.000)
GDP_cst_dol year	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)
GDP_cst_dol year	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)
tot_pop year	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)
tot_pop year	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)
EX_RATE_destination	0.00039*** (0.000)	0.00039*** (0.000)	0.00040*** (0.000)	0.00041*** (0.000)	0.00042*** (0.000)	0.00044*** (0.000)	0.00045*** (0.000)	0.00046*** (0.000)	0.00044*** (0.000)	0.00046*** (0.000)
EX_RATE_source	-0.00724*** (0.001)	-0.00732*** (0.001)	-0.00736*** (0.001)	-0.00737*** (0.001)	-0.00744*** (0.001)	-0.00743*** (0.001)	-0.00746*** (0.001)	-0.00745*** (0.001)	-0.00744*** (0.001)	-0.00745*** (0.001)
debit_personal_transfers_lag1		0.00022 (0.000)								0.00013 (0.000)
debit_personal_transfers_lag2			0.00016 (0.000)							0.00038 (0.000)
debit_personal_transfers_lag3				0.00013 (0.000)						0.00016 (0.000)
debit_personal_transfers_lag4					-0.00005 (0.000)					-0.00033 (0.000)
debit_personal_transfers_lag5						-0.00006 (0.000)				0.00006 (0.000)
debit_personal_transfers_lag6							-0.00023 (0.000)			0.00008 (0.000)
debit_personal_transfers_lag7								-0.00034 (0.000)		-0.00033 (0.000)
debit_personal_transfers_lag8									-0.00009 (0.000)	-0.00017 (0.000)
N	6.22e+04	6.17e+04	6.15e+04	6.10e+04	6.07e+04	6.02e+04	5.97e+04	5.91e+04	5.86e+04	5.78e+04
r2	0.50330	0.50487	0.50559	0.50668	0.50726	0.50847	0.50865	0.50895	0.50930	0.51020

* p¡0.10, ** p¡0.05, *** p¡0.01

Table D.10: For debit IMF data

For net flows IMF data

	(1) total cost of the transaction in percentage b/se	(2) total cost of the transaction in percentage b/se	(3) total cost of the transaction in percentage b/se	(4) total cost of the transaction in percentage b/se	(5) total cost of the transaction in percentage b/se	(6) total cost of the transaction in percentage b/se	(7) total cost of the transaction in percentage b/se	(8) total cost of the transaction in percentage b/se	(9) total cost of the transaction in percentage b/se	(10) total cost of the transaction in percentage b/se
net_flows_lag0	0.00009 (0.000)									0.00016** (0.000)
GDP_cst_dol year	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)	-0.00000 (0.000)
GDP_cst_dol year	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)
tot_pop year	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)	0.00000* (0.000)
tot_pop year	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)	0.00000 (0.000)
EX_RATE_destination	0.00040*** (0.000)	0.00039*** (0.000)	0.00040*** (0.000)	0.00041*** (0.000)	0.00045*** (0.000)	0.00044*** (0.000)	0.00044*** (0.000)	0.00045*** (0.000)	0.00045*** (0.000)	0.00048*** (0.000)
EX_RATE_source	-0.00726*** (0.001)	-0.00732*** (0.001)	-0.00733*** (0.001)	-0.00735*** (0.001)	-0.00740*** (0.001)	-0.00737*** (0.001)	-0.00733*** (0.001)	-0.00735*** (0.001)	-0.00734*** (0.001)	-0.00726*** (0.001)
net_flows_lag1		0.00008 (0.000)								-0.00003 (0.000)
net_flows_lag2			0.00011 (0.000)							0.00002 (0.000)
net_flows_lag3				0.00010 (0.000)						-0.00015** (0.000)
net_flows_lag4					0.00015** (0.000)					0.00000 (0.000)
net_flows_lag5						0.00015* (0.000)				0.00018 (0.000)
net_flows_lag6							0.00015** (0.000)			0.00007 (0.000)
net_flows_lag7								0.00012* (0.000)		0.00000 (0.000)
net_flows_lag8									0.00010 (0.000)	0.00002 (0.000)
N	6.15e+04	6.10e+04	6.07e+04	6.02e+04	5.99e+04	5.94e+04	5.89e+04	5.83e+04	5.77e+04	5.59e+04
r2	0.50470	0.50567	0.50608	0.50721	0.50803	0.50918	0.50926	0.50951	0.51018	0.51407

* p¡0.10, ** p¡0.05, *** p¡0.01

Table D.11:

For yearly remittances WB data

	(1) total cost of the transaction in percentage b/se	(2) total cost of the transaction in percentage b/se	(3) total cost of the transaction in percentage b/se	(4) total cost of the transaction in percentage b/se	(5) total cost of the transaction in percentage b/se
yearly_remittances_lag0	0.00000	0.00013**			-0.00000
	(0.000)	(0.000)			(0.000)
yearly_remittances_lag1	0.00035*		0.00022*		0.00035
	(0.000)		(0.000)		(0.000)
yearly_remittances_lag2	-0.00003			0.00023	-0.00003
	(0.000)			(0.000)	(0.000)
GDP_cst_dol year	0.00000	-0.00000	-0.00000	0.00000	-0.00000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
tot_pop year	0.00000	0.00000	0.00000	0.00000	0.00000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
tot_pop year	0.00000	0.00000	0.00000	0.00000	0.00000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
EX_RATE_destination	0.00035**	0.00032**	0.00033**	0.00037**	0.00036
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
EX_RATE_source	-0.00610***	-0.00801**	-0.00798**	-0.00617**	-0.00530*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
yearly_remittances_lag3					-0.00001
					(0.000)
N	2.78e+04	3.04e+04	3.04e+04	2.78e+04	2.54e+04
r2	0.50214	0.49472	0.49464	0.49825	0.50362

* p¡0.10, ** p¡0.05, *** p¡0.01

Table D.12: For yearly remittances WB data

	(1) yearly_remittances b/se	(2) credit_personal_transfers_lag0 b/se	(3) debit_personal_transfers_lag0 b/se	(4) net_flows_lag0 b/se
y_d_or_a_000000_lag0	0.188			
	(0.190)			
y_d_or_a_000000_lag1	0.100			
	(0.444)			
y_d_or_a_000000_lag2	1.139			
	(1.457)			
y_d_or_a_000000_lag3	-2.200			
	(1.704)			
GDP_cst_dol year	0.000	0.000	0.000*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
GDP_cst_dol year	0.000			
	(0.000)			
tot_pop year	0.000			
	(0.000)			
EX_RATE_destination	-0.129***	0.025	0.012	0.027
	(0.041)	(0.036)	(0.008)	(0.029)
EX_RATE_source	-0.428			
	(0.248)			
dead_or_affected_000000_lag0		2.245***	-0.073	2.295***
		(0.692)	(0.549)	(0.776)
dead_or_affected_000000_lag1		0.442	-0.253	0.684
		(0.567)	(0.490)	(0.517)
dead_or_affected_000000_lag2		-0.196	-0.155	-0.042
		(0.793)	(1.676)	(1.213)
dead_or_affected_000000_lag3		-2.160	-0.951	-1.208*
		(1.304)	(0.911)	(0.682)
tot_pop year		-0.000	0.000	-0.000
		(0.000)	(0.000)	(0.000)
N	2057.000	2068.000	1953.000	1922.000
r2	0.974	0.984	0.908	0.984

* p¡0.10, ** p¡0.05, *** p¡0.01

Table D.13: For yearly remittances WB data

	(1) yearly_remittances b/se	(2) credit_personal_transfers b/se	(3) debit_personal_transfers b/se	(4) net_flows b/se
lag0_y_d_or_a_pop	83.223			
	(268.938)			
lag0_dead_or_affected_pop		3371.733***	487.761	3021.535***
		(956.832)	(358.557)	(1050.591)
lag1_dead_or_affected_pop		459.104	-53.478	416.580
		(452.501)	(157.564)	(429.371)
lag2_dead_or_affected_pop		342.584	-109.250	422.265
		(421.931)	(294.625)	(394.410)
GDP_cst_dol year	-0.000	0.000**	0.000	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
GDP_cst_dol year	0.000	0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
share_rural	-5220.527	-6323.275	1347.271	-8481.219
	(4082.782)	(8318.717)	(4340.500)	(7415.005)
shre_rural_H	-1530.478	21054.941	-5634.035	26564.061
	(9027.539)	(14005.447)	(5669.517)	(17243.054)
tot_pop year	0.000	-0.000	0.000*	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
EX_RATE_destination	-0.154	-0.065	0.059***	-0.143***
	(0.103)	(0.048)	(0.018)	(0.051)
EX_RATE_source	-0.626	-1.966***	-0.217	-1.952***
	(0.628)	(0.491)	(0.175)	(0.544)
Years FE	Yes	No	No	No
Quarters FE	No	Yes	Yes	Yes
Destination country FE	No	No	No	No
Corridors FE	Yes	Yes	Yes	Yes
Disaster types FE	Yes	Yes	Yes	Yes
N	1215.000	1992.000	1935.000	1929.000
r2	0.977	0.989	0.896	0.990

* p¡0.10, ** p¡0.05, *** p¡0.01

Table E.14: Yearly and Quarterly Remittances

Appendix D.2. Disasters and Remittances

Appendix D.3. Disasters and Costs

Appendix E. Remittances and disasters – January work

The following table displays the equivalent results as in table (**??**) but it includes an additional number of lag to better highlight the vanishing effect. The price to pay is a lower number of observations (which does not seem to impact much the results).

SECOND ROUND WITH ABSORBING FUNCTION

	(1) yearly_remittances b/se	(2) credit_personal_transfers b/se	(3) debit_personal_transfers b/se	(4) net_flows b/se
lag0_y_d_or_a_pop	-186.506			
	(423.022)			
lag4_y_d_or_a_pop	-490.239			
	(635.783)			
lag8_y_d_or_a_pop	629.114			
	(1017.356)			
lag0_dead_or_affected_pop		7166.546***	1083.518	6236.587***
		(1019.185)	(919.519)	(859.531)
lag1_dead_or_affected_pop		791.866	-374.201	870.881
		(967.543)	(520.638)	(953.491)
lag2_dead_or_affected_pop		2291.146	220.850	1984.187
		(1505.300)	(700.372)	(1299.157)
lag3_dead_or_affected_pop		908.957	92.479	780.926
		(578.441)	(371.418)	(691.677)
lag4_dead_or_affected_pop		-535.383	-161.700	-597.302
		(1109.973)	(525.153)	(1096.906)
lag5_dead_or_affected_pop		76.353	406.922	-543.089
		(853.064)	(443.542)	(842.878)
lag6_dead_or_affected_pop		1914.763*	45.961	1623.021
		(1121.624)	(373.533)	(1309.246)
lag7_dead_or_affected_pop		2549.418**	-64.037	2373.579**
		(1198.200)	(418.353)	(886.112)
lag8_dead_or_affected_pop		1044.155*	242.314	776.584
		(601.862)	(539.100)	(623.184)
GDP_cst_dol year	-0.000***	0.000**	-0.000**	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
GDP_cst_dol year	0.000	0.000	-0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)
share_rural	-5083.598	-1.10e+04	3823.216	-1.65e+04**
	(9115.317)	(7906.789)	(7051.612)	(7352.427)
share_rural_H	1514.549	35647.805*	-3.06e+04***	65971.236***
	(8786.873)	(18587.579)	(9959.477)	(19103.460)
tot_pop year	0.000	-0.000	0.000	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)
EX_RATE_destination	-0.188**	-0.126**	0.076**	-0.212***
	(0.089)	(0.059)	(0.028)	(0.071)
EX_RATE_source	-0.494	-4.969**	2.856	-4.789
	(0.715)	(2.368)	(4.775)	(4.584)
Years FE	Yes	No	No	No
Quarters FE	No	Yes	Yes	Yes
Source country FE	No	No	No	No
Destination country FE	No	No	No	No
Corridors FE	Yes	Yes	Yes	Yes
Disaster types FE	Yes	Yes	Yes	Yes
N	618.000	893.000	884.000	882.000
r2	0.980	0.991	0.910	0.993

* pj0.10, ** pj0.05, *** pj0.01

Table E.15: Remittances and disasters with lags

	(1)	(2)	(3)	(4)	(5)
	total cost	total cost	total cost	total cost	total cost
	b/se	b/se	b/se	b/se	b/se
lag0_dead_or_affected_000000	0.003**	0.003**	0.002**	0.002**	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
lag1_dead_or_affected_000000	0.00175150	0.00205282	0.00150454	0.00150454	0.00154788
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
ln_dead_or_affected	-0.00528757	-0.00322843			0.00290344
	(0.007)	(0.009)			(0.008)
lag1_ln_dead_or_affected	-0.000998298	-0.00166216			-0.00104923
	(0.007)	(0.009)			(0.008)
Gapin days		0.000690317	0.000463022	0.000463022	0.000449219
		(0.001)	(0.000)	(0.000)	(0.000)
lag1_Gapindays		-0.000540391	-0.000859817*	-0.000859817*	-0.000851178
		(0.001)	(0.001)	(0.001)	(0.001)
yearly_remittances		4.16996e-05***	4.30736e-05***	4.30736e-05***	4.31158e-05***
		(0.000)	(0.000)	(0.000)	(0.000)
GDP_cst_dol year		7.74365e-13	6.40161e-13	6.40161e-13	6.45406e-13
		(0.000)	(0.000)	(0.000)	(0.000)
share_rural		-3.82708e-06	-3.89056e-06	-3.89056e-06	-3.89019e-06
		(0.000)	(0.000)	(0.000)	(0.000)
share_rural_H		3.28033e-06*	1.90391e-06	1.90391e-06	1.90568e-06
		(0.000)	(0.000)	(0.000)	(0.000)
tot_pop year		0.461946	0.442566	0.442566	0.442579
		(0.467)	(0.478)	(0.478)	(0.478)
tot_pop year		0.149023	0.0972486	0.0972486	0.0977698
		(0.164)	(0.152)	(0.152)	(0.152)
(log)Geodesic distance		22.91058**	18.01780*	18.01780*	18.06347*
		(11.233)	(10.229)	(10.229)	(10.232)
colonized_by_receiving		-69.79502*	-52.23360	-52.23360	-52.45094
		(40.100)	(35.098)	(35.098)	(35.104)
common_language		41.00213**	31.91483*	31.91483*	31.98657*
		(18.955)	(17.788)	(17.788)	(17.791)
Quarters controls	Yes	Yes	Yes	Yes	Yes
Corridors controls	Yes	Yes	Yes	Yes	Yes
Disaster types controls	Yes	Yes	Yes	Yes	Yes
Firms types controls	Yes	Yes	Yes	Yes	Yes
Transfer speed controls	Yes	Yes	Yes	Yes	Yes
Access point controls	Yes	Yes	Yes	Yes	Yes
N	44226.000	39472.000	38725.000	38725.000	38725.000

* p¡0.10, ** p¡0.05, *** p¡0.01

Table E.16: Costs of Remittances

	(1) total cost b/se	(2) total cost b/se	(3) total cost b/se	(4) total cost b/se
lag0_dead_or_affected_000000	0.009***	0.007***	0.006***	0.007***
	(0.003)	(0.002)	(0.002)	(0.001)
lag1_dead_or_affected_000000	0.005	0.003	0.003	0.003
	(0.003)	(0.002)	(0.002)	(0.002)
lag4_dead_or_affected_000000	0.002	0.002	0.002	0.002
	(0.002)	(0.002)	(0.001)	(0.001)
lag8_dead_or_affected_000000	0.000	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
2.lag0_disastertype_cat	0.830**	0.613**	0.395	0.486*
	(0.334)	(0.290)	(0.260)	(0.241)
3.lag0_disastertype_cat	0.503	0.381	0.258	0.433
	(0.461)	(0.410)	(0.407)	(0.290)
5.lag0_disastertype_cat	0.252	0.172	0.047	0.137
	(0.326)	(0.265)	(0.242)	(0.205)
6.lag0_disastertype_cat	0.518	0.433	0.309	0.390
	(0.358)	(0.311)	(0.289)	(0.238)
7.lag0_disastertype_cat	0.044	-0.005	-0.104	-0.012
	(0.425)	(0.401)	(0.381)	(0.341)
8.lag0_disastertype_cat	-1.804	-2.227	-3.781	-3.463**
	(1.699)	(2.439)	(2.552)	(1.610)
9.lag0_disastertype_cat	0.361	0.245	0.108	0.188
	(0.354)	(0.308)	(0.262)	(0.222)
10.lag0_disastertype_cat	0.270	0.146	-0.000	0.091
	(0.348)	(0.296)	(0.257)	(0.210)
11.lag0_disastertype_cat	0.396	0.287	0.137	0.213
	(0.338)	(0.274)	(0.256)	(0.220)
12.lag0_disastertype_cat	0.535	0.343	0.090	0.196
	(0.359)	(0.344)	(0.325)	(0.305)
13.lag0_disastertype_cat	1.102**	0.877*	0.848*	0.916**
	(0.491)	(0.472)	(0.415)	(0.414)
Gap in days	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
lag1_Gapindays	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)
Quarters FE	Yes	Yes	Yes	Yes
Corridors FE	Yes	Yes	Yes	Yes
Disaster types FE	Yes	Yes	Yes	Yes
Firms types FE	No	Yes	Yes	Yes
Transfer speed FE	No	No	Yes	Yes
Access point FE	No	No	No	Yes
N	21223.000	20960.000	20960.000	20793.000
r2	0.393	0.471	0.503	0.527

* pi0.10, ** pi0.05, *** pi0.01

Table E.17: Cost of Remittances