William's Update

Remittances

William Clinton Co

September 5, 2025

Abstract

This document is a follow-up to the meeting on September 29th and addresses the items discussed during that meeting. This provides an update on who was contacted regarding the remittance datasets, offers updates on previously problematic pdf file links, and clarifies how the stablecoin/bitcoin cross-border flows dataset works. Most importantly, this presents the extracted remittance data from Remitscope.

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1 Update on Remitscope

1.1 Contacted

I have been searching for possible contacts related to Remitscope. It appears to be linked to the email and website

- migrationdataportal@iom.int
- Migration Data Portal Contact.

I have reached out to them, but the main Remitscope email (remittances@ifad.org) has not replied yet. Other relevant contacts made include:

- ifad@ifad.org
- a.trillobarca@ifad.org
- remittances@ifad.org

I also found and reached out to the following LinkedIn profiles:

- K.K. Podar
- Montie Mlachila
- Vigninou Gammadigbe
  - Vigninou replied to me. He is the author of Defying the Odds: Remittances During the COVID-19 Pandemic, which utilized a relatively modern version of the remittance dataset. This work was also discussed in 8.pdf.
  - I mainly asked him about datasets. But we can also arrange a meeting if need be.

1.2 Not Contacted

Additionally, I was able to find names attached to Remitscope in this image:

and in this LinkedIn post.

I eventually ran out of connection requests, which is probably for the best, but these are people to potentially connect with. I am still considering the best approach for outreach.

Other relevant people I found:

- Leon Isaacs
- Leonard Makuvaza
- Pedro de Vasconcelos
- Sarah Hugo
- LinkedIn Remittance Activity Post

2 PDF Link

Here is the previous PDF link, which was previously not working: 8.pdf

3 Found Remitscope Dataset

During my research, I examined the Remitscope website in detail and discovered raw data embedded within the website. While I am unsure if this data is intended to be public, it was located deep within the site code. The extracted files are saved in `data/Remittance_3` .

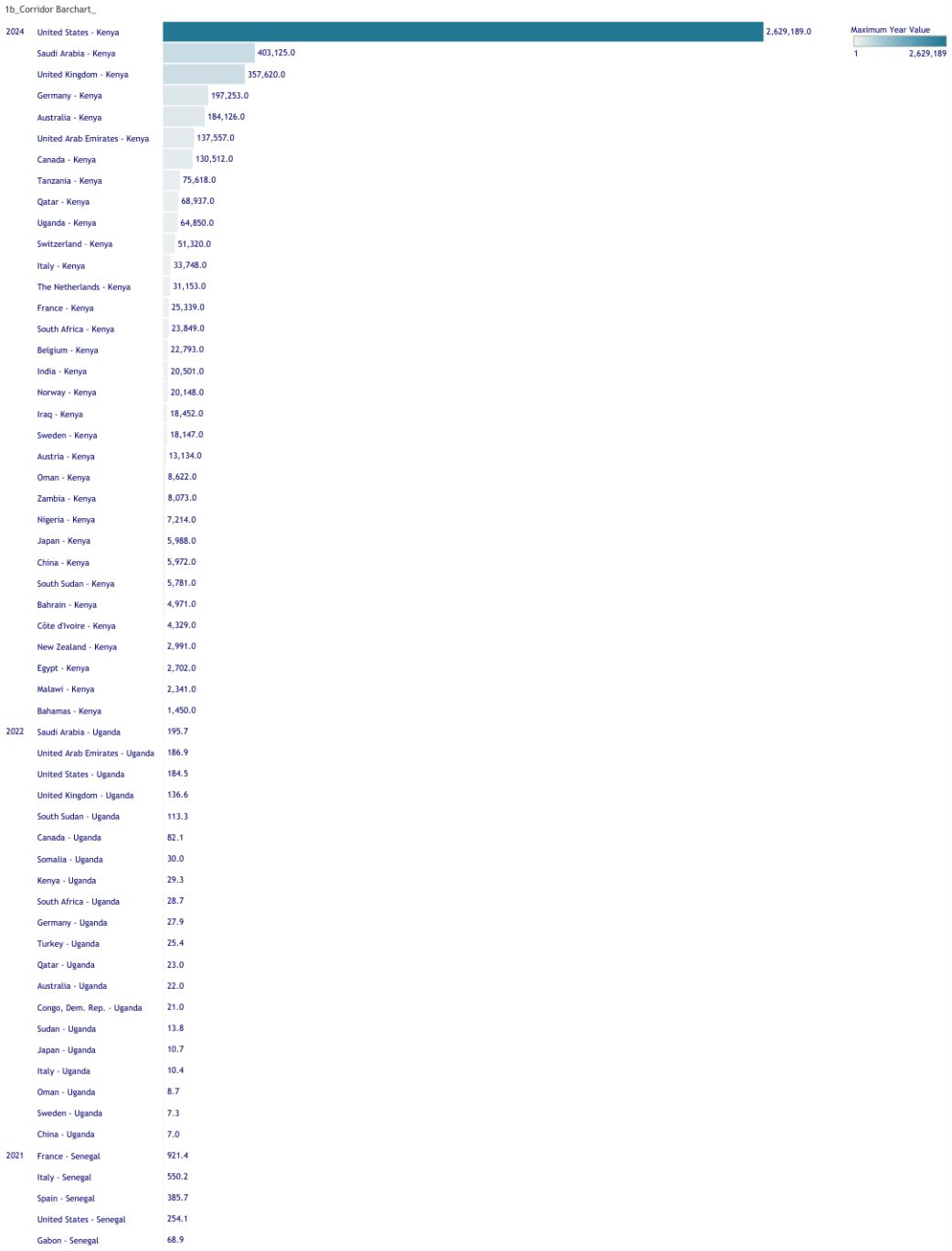
3.1 Remitscope Data analysis

This is a quote from Remitscope

> The World Bank has historically published estimates on remittance inflows and outflows at a corridor level (in a bilateral matrix). Estimated flows have been based on the number of migrants living in the host country and an estimate on the amount they send home (based on the income differential between the two countries). Whilst this data is understood not to be as accurate and has since been removed from the World Bank website, it is currently the best source available for this data, which provides an indication of the relative value of flows across corridors.

- The central bank data is sparse; from central banks we have data for 2020 to 2024, but many country pairs are missing compared to the World Bank dataset.
- The World Bank data covers only 2021, but is much more detailed.
- Currently, the dataset includes only African and Latin American countries. We need to decide whether this limited coverage is sufficient for our analysis.

To see a overview of the data see the following images:


1b_Corridor Barchart_
2024 United States - Kenya 2,629,189.0
Saudi Arabia - Kenya 403,125.0
United Kingdom - Kenya 357,620.0
Germany - Kenya 197,253.0
Australia - Kenya 184,126.0
United Arab Emirates - Kenya 137,557.0
Canada - Kenya 130,512.0
Tanzania - Kenya 75,618.0
Qatar - Kenya 68,937.0
Uganda - Kenya 64,850.0
Switzerland - Kenya 51,320.0
Italy - Kenya 33,748.0
The Netherlands - Kenya 31,153.0
France - Kenya 25,339.0
South Africa - Kenya 23,849.0
Belgium - Kenya 22,793.0
India - Kenya 20,501.0
Norway - Kenya 20,148.0
Iraq - Kenya 18,452.0
Sweden - Kenya 18,147.0
Austria - Kenya 13,134.0
Oman - Kenya 8,622.0
Zambia - Kenya 8,073.0
Nigeria - Kenya 7,214.0
Japan - Kenya 5,988.0
China - Kenya 5,972.0
South Sudan - Kenya 5,781.0
Bahrain - Kenya 4,971.0
Côte d'Ivoire - Kenya 4,329.0
New Zealand - Kenya 2,991.0
Egypt - Kenya 2,702.0
Malawi - Kenya 2,341.0
Bahamas - Kenya 1,450.0
2022 Saudi Arabia - Uganda 195.7
United Arab Emirates - Uganda 186.9
United States - Uganda 184.5
United Kingdom - Uganda 136.6
South Sudan - Uganda 113.3
Canada - Uganda 82.1
Somalia - Uganda 30.0
Kenya - Uganda 29.3
South Africa - Uganda 28.7
Germany - Uganda 27.9
Turkey - Uganda 25.4
Qatar - Uganda 23.0
Australia - Uganda 22.0
Congo, Dem. Rep. - Uganda 21.0
Sudan - Uganda 13.8
Japan - Uganda 10.7
Italy - Uganda 10.4
Oman - Uganda 8.7
Sweden - Uganda 7.3
China - Uganda 7.0
2021 France - Senegal 921.4
Italy - Senegal 550.2
Spain - Senegal 385.7
United States - Senegal 254.1
Gabon - Senegal 68.9
Maximum Year Value
1
2,629,189

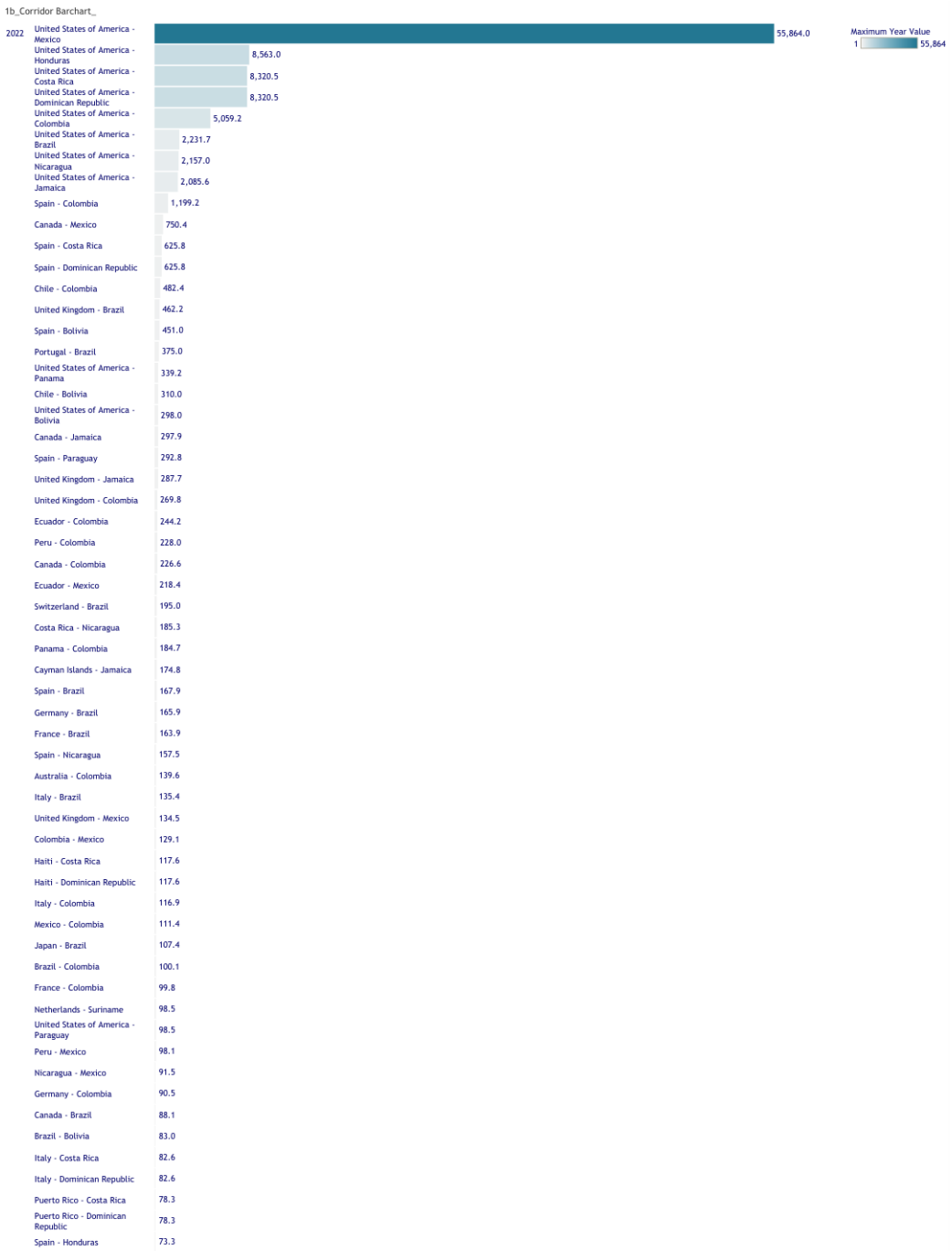
1b_Corridor Barchart_

2021	Belgium - Senegal	53.8
	Germany - Senegal	45.0
	Côte d'Ivoire - Senegal	42.3
	Congo, Rep. - Senegal	41.1
	United Kingdom - Senegal	40.0
	Mali - Senegal	27.8
	Cameroon - Senegal	24.6
	Burkina Faso - Senegal	17.4
	Portugal - Senegal	17.2
	Brazil - Senegal	14.2
	Benin - Senegal	13.0
	Togo - Senegal	11.8
	South Africa - Senegal	11.3
	Luxembourg - Senegal	6.4
	Central African Republic - Senegal	6.3
	Niger - Senegal	6.1
	Chad - Senegal	5.7
	Greece - Senegal	4.6
	Denmark - Senegal	3.6
	Equatorial Guinea - Senegal	3.1
	Guinea-Bissau - Senegal	2.9
	United Arab Emirates - Senegal	2.0
	Morocco - Senegal	1.1
2020	France - Morocco	2,740.2
	Spain - Morocco	705.7
	Italy - Morocco	696.6
	Saudi Arabia - Morocco	532.4
	United Arab Emirates - Morocco	454.7
	United States - Morocco	422.4
	Belgium - Morocco	387.6
	United States - Ethiopia	387.0
	Germany - Morocco	349.6
	United Arab Emirates - Ethiopia	282.1
	Namibia - Morocco	275.3
	United Kingdom - Morocco	204.8
	Djibouti - Ethiopia	185.5
	Qatar - Morocco	137.6
	Saudi Arabia - Ethiopia	137.5
	Switzerland - Morocco	119.5
	Kuwait - Morocco	107.6
	Canada - Morocco	99.8
	United Kingdom - Ethiopia	86.2
	Lebanon - Ethiopia	72.8
	South Africa - Ethiopia	67.9
	Germany - Ethiopia	61.5
	Italy - Ethiopia	40.6
	Canada - Ethiopia	33.9
	Sweden - Morocco	32.3
	Bahrain - Morocco	30.3
	Norway - Morocco	28.7
	Denmark - Morocco	28.3
	Sweden - Ethiopia	23.2
	Namibia - Kenya	22.3
	Oman - Morocco	19.5
	Israel - Ethiopia	16.1
	Kuwait - Ethiopia	13.7
	Australia - Ethiopia	13.6
	Norway - Ethiopia	13.0

Maximum Year Value

1 2,629,189

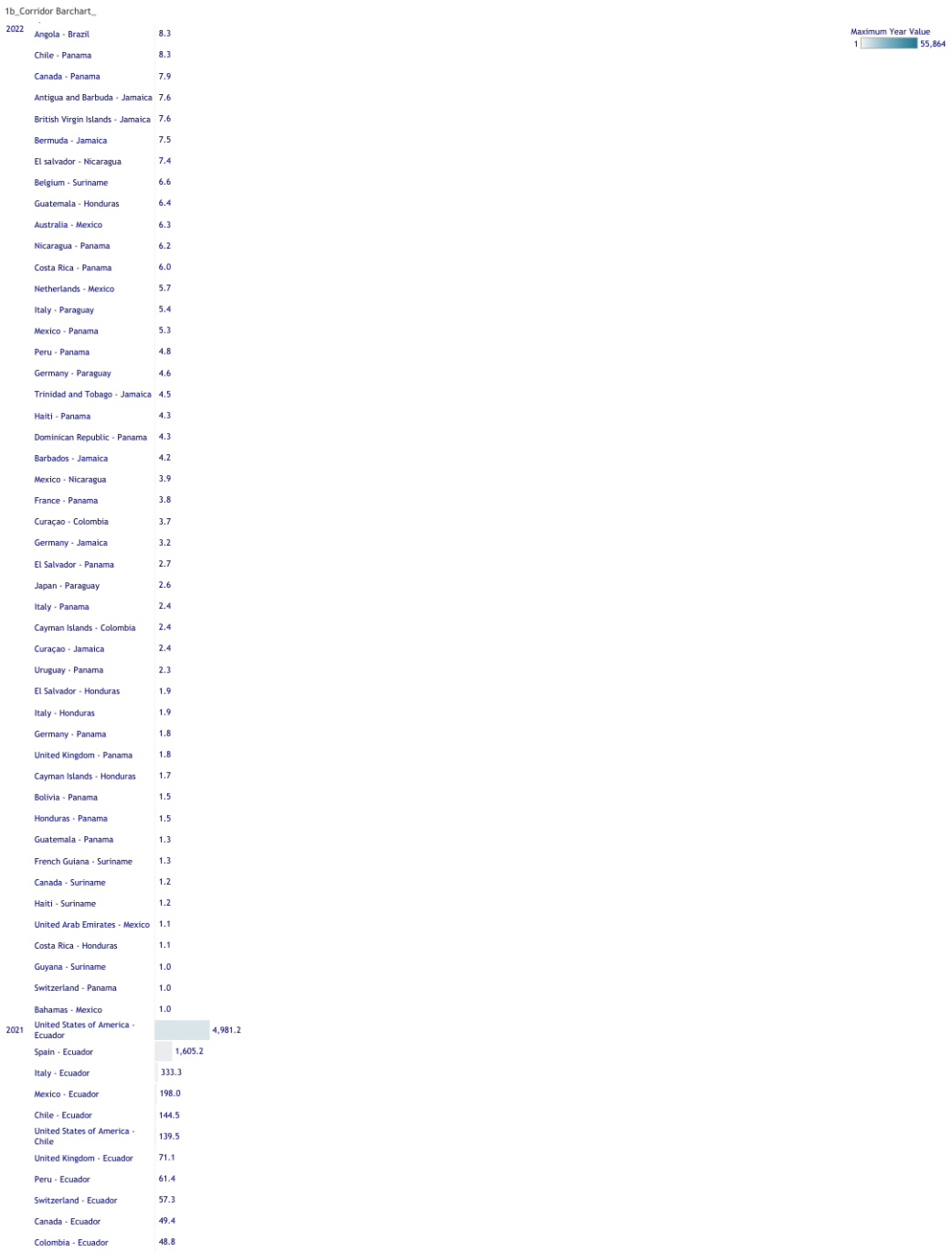

1b_Corridor Barchart_
2020
South Sudan - Ethiopia
11.3
Sudan - Ethiopia
1.9
Maximum Year Value
1
2,629,189


1b_Corridor Barchart_
2022
United States of America - Mexico 55,864.0
United States of America - Honduras 8,563.0
United States of America - Costa Rica 8,320.5
United States of America - Dominican Republic 8,320.5
United States of America - Colombia 5,059.2
United States of America - Brazil 2,231.7
United States of America - Nicaragua 2,157.0
United States of America - Jamaica 2,085.6
Spain - Colombia 1,199.2
Canada - Mexico 750.4
Spain - Costa Rica 625.8
Spain - Dominican Republic 625.8
Chile - Colombia 482.4
United Kingdom - Brazil 462.2
Spain - Bolivia 451.0
Portugal - Brazil 375.0
United States of America - Panama 339.2
Chile - Bolivia 310.0
United States of America - Bolivia 298.0
Canada - Jamaica 297.9
Spain - Paraguay 292.8
United Kingdom - Jamaica 287.7
United Kingdom - Colombia 269.8
Ecuador - Colombia 244.2
Peru - Colombia 228.0
Canada - Colombia 226.6
Ecuador - Mexico 218.4
Switzerland - Brazil 195.0
Costa Rica - Nicaragua 185.3
Panama - Colombia 184.7
Cayman Islands - Jamaica 174.8
Spain - Brazil 167.9
Germany - Brazil 165.9
France - Brazil 163.9
Spain - Nicaragua 157.5
Australia - Colombia 139.6
Italy - Brazil 135.4
United Kingdom - Mexico 134.5
Colombia - Mexico 129.1
Haiti - Costa Rica 117.6
Haiti - Dominican Republic 117.6
Italy - Colombia 116.9
Mexico - Colombia 111.4
Japan - Brazil 107.4
Brazil - Colombia 100.1
France - Colombia 99.8
Netherlands - Suriname 98.5
United States of America - Paraguay 98.5
Peru - Mexico 98.1
Nicaragua - Mexico 91.5
Germany - Colombia 90.5
Canada - Brazil 88.1
Brazil - Bolivia 83.0
Italy - Costa Rica 82.6
Italy - Dominican Republic 82.6
Puerto Rico - Costa Rica 78.3
Puerto Rico - Dominican Republic 78.3
Spain - Honduras 73.3
Maximum Year Value
1
55,864

1b_Corridor Barchart_

2022	Switzerland - Costa Rica	68.8
	Switzerland - Dominican Republic	68.8
	Switzerland - Colombia	68.4
	Argentina - Bolivia	68.0
	Canada - Costa Rica	64.7
	Canada - Dominican Republic	64.7
	Dominican Republic - Mexico	60.4
	Spain - Mexico	59.3
	Chile - Mexico	58.3
	Netherlands - Brazil	53.3
	Guatemala - Mexico	50.0
	El Salvador - Mexico	49.7
	Brazil - Mexico	39.5
	Panama - Mexico	38.5
	France - Costa Rica	38.0
	France - Dominican Republic	38.0
	Germany - Costa Rica	35.5
	Germany - Dominican Republic	35.5
	Aruba - Colombia	33.1
	France - Mexico	31.7
	Honduras - Mexico	31.4
	Panama - Nicaragua	31.4
	Germany - Mexico	29.7
	Dominican Republic - Colombia	28.5
	Costa Rica - Colombia	28.2
	Panama - Costa Rica	27.8
	Panama - Dominican Republic	27.8
	Argentina - Paraguay	25.4
	Bolivia - Colombia	24.4
	Guatemala - Colombia	23.7
	Israel - Colombia	21.9
	Belgium - Colombia	21.8
	Bahamas - Jamaica	21.8
	Netherlands - Colombia	21.0
	Canada - Nicaragua	20.1
	Italy - Mexico	19.1
	Argentina - Mexico	18.7
	Argentina - Colombia	18.0
	United States of America - Suriname	17.3
	Costa Rica - Mexico	16.2
	Colombia - Panama	15.4
	Sweden - Colombia	14.8
	Venezuela - Colombia	14.7
	Turks and Caicos Islands - Jamaica	14.4
	Switzerland - Mexico	13.6
	Canada - Honduras	13.5
	Mexico - Honduras	12.5
	France - Suriname	12.2
	United Arab Emirates - Colombia	12.0
	Brazil - Paraguay	11.8
	France - Paraguay	10.8
	Bolivia - Mexico	10.5
	Uruguay - Mexico	10.3
	Chile - Paraguay	9.8
	Honduras - Colombia	9.8
	Ecuador - Panama	9.3
	Brazil - Panama	9.1
	Spain - Panama	8.8

Maximum Year Value
1 55,864


1b_Corridor Barchart_
Maximum Year Value
1
55,864
2022
Angola - Brazil 8.3
Chile - Panama 8.3
Canada - Panama 7.9
Antigua and Barbuda - Jamaica 7.6
British Virgin Islands - Jamaica 7.6
Bermuda - Jamaica 7.5
El salvador - Nicaragua 7.4
Belgium - Suriname 6.6
Guatemala - Honduras 6.4
Australia - Mexico 6.3
Nicaragua - Panama 6.2
Costa Rica - Panama 6.0
Netherlands - Mexico 5.7
Italy - Paraguay 5.4
Mexico - Panama 5.3
Peru - Panama 4.8
Germany - Paraguay 4.6
Trinidad and Tobago - Jamaica 4.5
Haiti - Panama 4.3
Dominican Republic - Panama 4.3
Barbados - Jamaica 4.2
Mexico - Nicaragua 3.9
France - Panama 3.8
Curaçao - Colombia 3.7
Germany - Jamaica 3.2
El Salvador - Panama 2.7
Japan - Paraguay 2.6
Italy - Panama 2.4
Cayman Islands - Colombia 2.4
Curaçao - Jamaica 2.4
Uruguay - Panama 2.3
El Salvador - Honduras 1.9
Italy - Honduras 1.9
Germany - Panama 1.8
United Kingdom - Panama 1.8
Cayman Islands - Honduras 1.7
Bolivia - Panama 1.5
Honduras - Panama 1.5
Guatemala - Panama 1.3
French Guiana - Suriname 1.3
Canada - Suriname 1.2
Haiti - Suriname 1.2
United Arab Emirates - Mexico 1.1
Costa Rica - Honduras 1.1
Guyana - Suriname 1.0
Switzerland - Panama 1.0
Bahamas - Mexico 1.0
2021
United States of America - Ecuador 4,981.2
Spain - Ecuador 1,605.2
Italy - Ecuador 333.3
Mexico - Ecuador 198.0
Chile - Ecuador 144.5
United States of America - Chile 139.5
United Kingdom - Ecuador 71.1
Peru - Ecuador 61.4
Switzerland - Ecuador 57.3
Canada - Ecuador 49.4
Colombia - Ecuador 48.8

1b_Corridor Barchart_

2021	Germany - Ecuador	43.6
	France - Ecuador	42.7
	Peru - Chile	30.5
	Spain - Chile	27.0
	Belgium - Ecuador	21.5
	Panama - Ecuador	18.6
	Canada - Chile	14.4
	Brazil - Ecuador	13.0
	Netherlands - Ecuador	10.9
	Colombia - Chile	10.8
	Bolivia - Chile	9.4
	Ecuador - Chile	8.5
	Australia - Chile	8.5
	Argentina - Chile	8.2
	Bolivia - Ecuador	7.4
	Sweden - Ecuador	6.7
	Russian Federation - Ecuador	6.6
	Argentina - Ecuador	6.5
	Sweden - Chile	6.3
	France - Chile	5.9
	Australia - Ecuador	5.6
	Brazil - Chile	5.4
	Dominican Republic - Ecuador	5.2
	Mexico - Chile	4.8
	Italy - Chile	4.7
	United Kingdom - Chile	4.5
	Israel - Ecuador	4.3
	Switzerland - Chile	4.0
	Guatemala - Ecuador	3.7
	Uruguay - Ecuador	3.5
	Costa Rica - Ecuador	3.1
	El Salvador - Ecuador	2.6
	Aruba - Ecuador	2.5
	Ukraine - Ecuador	2.4
	Austria - Ecuador	2.3
	Honduras - Ecuador	2.2
	Paraguay - Ecuador	2.1
	Panama - Chile	2.0
	Paraguay - Chile	2.0
	Albania - Ecuador	1.9
	Turkey - Ecuador	1.8
	Venezuela - Ecuador	1.7
	China - Ecuador	1.6
	Portugal - Ecuador	1.6
	Norway - Ecuador	1.6
	China - Chile	1.5
	Haiti - Ecuador	1.4
	Bahamas - Ecuador	1.2
	Lebanon - Ecuador	1.2
	Denmark - Ecuador	1.2
	Qatar - Ecuador	1.1
	Nicaragua - Ecuador	1.0
2019	United States of America - Haiti	1,775.4
	Chile - Haiti	170.3
	France - Haiti	103.0
	Canada - Haiti	92.8
	Brazil - Haiti	75.6
	Dominican Republic - Haiti	67.9

This is relatively limited compared to the world bank dataset.

4 Clarification on Bitcoin

The challenge with analyzing Bitcoin transactions is that, while every micro-level transaction is publicly observable, the wallets involved are anonymized. As a result, we cannot directly determine the geographic locations of the transactions.

4.1 3 approaches

4.1.1 Approach 1: Exchange Wallets

This is the initial approach, similar to what we would do with standard fiat currency:

1. We observe wallets.
2. We can determine where these wallets are based and construct the dataset shown below. Here, the *exchanges* function as the "banks" in the traditional fiat system.

Table 2: Blockchain: matched cross-exchange transactions

This table shows the structure of the blockchain matched transactions. The dataset contains 592,218 cross-exchange transactions over Aug 2nd, 2011–Feb 7th, 2020.

Time	Amount (BTC))	Sending address	Receiving address
2 Aug 2011 11:08:39	0.1405	Cavirtex	VirWoX
11 Sep 2011 07:25:02	7.9610	Cavirtex	BTC-e
...			
28 Mar 2018 06:25:41	147.0000	MercadoBitcoin	Poloniex
...			
07 Feb 2020 05:17:26	0.7613	Kraken	Poloniex

3. The main limitation is that *exchanges* are not bound by geography, which restricts this method. An exception is China, where the "Great Firewall" blocks access to foreign websites, requiring exchanges to be registered in China to serve Chinese users. This allows for a distinction between China-based and non-China-based exchanges, as done in this link.

4.1.2 Approach 2: Exchange Wallets and Web Traffic

1. This approach builds on the limitations of Approach 1.
2. We can observe web traffic to the exchanges, including the geographic locations of the visitors. We also observe micro-transactions occurring across various exchanges.
3. Suppose there are two countries (Canada and China) and two exchanges (FTX and Binance):

Suppose we observe a transaction of 100 BTC (Bitcoin), where a transfer occurs from FTX to Binance.

Assume the users of FTX (the senders) are:

- 50% from Canada
- 50% from China

And the users of Binance (the receivers) are:

- 10% in Canada
- 90% in China

If 100 BTC is sent from FTX to Binance, the flows can be broken down as follows:

- 50 BTC leave Canada (100 BTC × 50%)
- 50 BTC leave China (100 BTC × 50%)
- 10 BTC arrive in Canada (100 BTC × 10%)
- 90 BTC arrive in China (100 BTC × 90%)

This can be further disaggregated:

- 5 BTC: Canada to Canada (50 BTC × 10%)
- 45 BTC: Canada to China (50 BTC × 90%)
- 5 BTC: China to Canada (50 BTC × 10%)
- 45 BTC: China to China (50 BTC × 90%)

The net flow is:

- 45 BTC from Canada to China
- 5 BTC from China to Canada

4.1.2.1 Assumptions

4. Key assumption:
    1. users do not mask online activity by employing virtual private networks (VPNs)
    2. transaction amounts are, on average, broadly equal across users in different countries
    3. These assumptions are similar to those used by the IMF when estimating remittances based on population shares.
        1. For example, suppose we observe remittances in Canada, where the immigrant population is 50% from China and 50% from the Philippines. If total remittances are $100 CAD, we would attribute $50 CAD to China and $50 CAD to the Philippines, reflecting the 50% immigrant profile.
        2. In this IMF example, the key assumption is that transaction amounts are uniform across each individual (similar to the bitcoin assumption)

4.1.3 Approach 3: Fiat Currencies

1. peer-to-peer exchange called LocalBitcoins: an escrow service for Bitcoin transactions.
2. When people want to trade Bitcoin, they use LocalBitcoins to exchange Bitcoin for fiat currency.
3. These transactions are observable: we can see the amount of BTC sold and the amount of fiat currency exchanged. We can not observe the wallets.
4. The key innovation is because Bitcoin transactions are public, researchers look for transactions of the same size and timeframe to link wallets with the fiat currency transaction.
5. For example, suppose an individual buys Bitcoin with Philippine pesos
6. LocalBitcoins records a transaction of 1.000003 BTC for 6 million pesos on August 31st at 2:00 PM.
7. Using the developed algorithm, it searches for a matching 1.000003 BTC transaction on the public blockchain.
8. Once found, the anonymized wallet involved in the transaction can be observed and associated with the Philippines and Philippine pesos.
9. Next, suppose someone sells 1.000003 BTC for 150,000 CAD in Canada at 2:30 PM on the same day.

10. The algorithm repeats the process, associating the wallet with both the Philippines and Canada.
11. In this way, a cross-border transfer is identified and recorded, Philippines to Canada cross border flow.

4.1.3.1 Assumptions

6. Key Assumptions:
7. The probability of observing two transactions of the same size within a 5-hour period is low.
8. People are risk-averse and minimize bitcoin volatility by immediately trading it.
9. LocalBitcoins is representative of broader crypto cross-border flows.

More detail can be found in this paper.

4.2 Stablecoin Flows Paper

A recent paper, Decrypting Crypto: How to Estimate International Stablecoin Flows (IMF, 2025)

1. The study analyzes stablecoin flows by integrating transaction data with exchange locations, timing of activity, and geographic patterns to infer wallet origins.
2. It leverages user-assigned domain names (e.g., "Pierre") as identifiers, providing additional context beyond anonymized wallet strings.
3. AI models combine domain names with transaction timing to estimate user locations for instance, a wallet named "Pierre" active during France business hours is probabilistically associated with Europe.
4. The model also incorporates data from region-specific exchanges. An example would be suppose we observe a wallet interacting with Coinhouse, a Paris-based crypto exchange, with a domain name "Pierre" combined with France time trading behavior. This information would associate the wallet with a high probability to Europe.
5. Unlike most prior work, which emphasizes stablecoins as hedges against U.S. dollar instability, this paper highlights their significance in facilitating cross-border flows.

Key findings from the paper include:

> In absolute terms, Asia and the Pacific lead with the highest stablecoin activity (inflows: $407bn, outflows: $395bn, intraregional flows: $209bn), followed by North America (inflows: $363bn, outflows: $417bn, intraregional flows: $216bn). However, relative to GDP, Africa and the Middle East, and Latin America and the Caribbean stand out, with stablecoin usage reaching 6.7% and 7.7% of GDP, respectively.
>
> Calculating bilateral net flows highlights North America as the primary source of stablecoin outflows into all other regions of the world, estimated at $54bn in 2024. The data show that net stablecoin flows from North America to other regions increase when domestic currencies are weak.
>
> This suggests that stablecoins could increasingly serve as an instrument to meet global demand for dollars, particularly in regions where access to traditional dollar markets is constrained.
>
> Stablecoins are typically minted in the U.S., where issuers convert fiat dollars into digital tokens. The analysis shows that stablecoin net flows are largely outflows from North

America. The authors hypothesize that these net outflows are linked to global demand for U.S. dollars, especially when local currencies depreciate.

4.2.1 Dataset Discrepancies

Big discrepancies between the various methodologies, possibly because of VPN. > For 2024, we estimate 5.5 times more gross stablecoin flows involving China (i.e., $153bn vs $28bn) and 100 times more net flows of stablecoins into China (i.e., $18bn vs $0.18bn)

5 Appendix

5.1 IMF External Sector Report

For further reading, see the IMF External Sector Report (2025, Chapter 2).