Supplementary Materials

A FATF Risk-Based Approach Guidance

The FATF specifies six broad characteristics indicative of potentially high-risk activity in the cryptocurrency sector: "Technological features that increase anonymity..., geographic features..., transaction patterns – including transactions which are structured to avoid reporting or appear irregular, unusual or uncommon; transaction size – if the amount and frequency has no logical business explanation; sender or recipient profiles; and source of funds or wealth" (FATF 2021, p. 88).

B Trading Pairs Summary

See Table 7.

C Data Cleaning

I performed several steps to prepare the data for analysis. First, I removed data from 3 exchanges with registrations in multiple jurisdictions. I also excluded trading pairs with low transaction volumes (less than an average of 30 transactions per hour) because the statistical method I use (bunching estimation) requires sufficiently frequent observations to estimate valid parameters. In total, these low-volume pairs accounted for only 0.5% of all transactions close to the threshold (within 500 dollars/euros), assuaging concerns that their removal would substantially influence the results. Lastly, I excluded data from 5 exchanges that show abnormal distributions within their trading pairs given the high likelihood that they include fake data (more details are provided in Section I).

Table 7: Trading Pairs Summary

Fiat Currency	Count of Trading Pairs	
	Bitcoin	Ethereum
Australian Dollar	2	0
Brazilian Real	3	1
Euro	6	6
British Pound	2	1
Indian Rupee	1	1
Japanese Yen	5	4
South Korean Won	3	3
Russian Ruble	2	0
Turkish Lira	3	3
US Dollar	10	9
Total	37	28

Notes: Table shows the number of pairs in the sample for each crypto-to-fiat trade. Each count represents the number of exchanges that offered that trading pair.

D Fees by Cryptocurrency Exchange

Table 8 shows fees at select major cryptocurrency exchanges as of January 1, 2021.[25] Most exchanges operate on a percentage base fee structure, which should not influence incentives around the size of each trade. Several exchanges offer volume discounts or (occasionally) flat fees, measures that should encourage traders to execute larger rather than smaller transactions.

Table 8: Fees by Cryptocurrency Exchange

Exchange	Trading Fees			Funding Fees		Discounts	
	Maker	Taker	Spread	Deposits	Withdrawals	Exchange Token Discount	Volume Discount
Binance.us	0.1%	0.1%	No	No	No	Yes - 25%	Yes
Binance.com	0.1%	0.1%	No	No	Yes	Yes - 25%	Yes
Bitfinex	0.1%	0.2%	No	No	Yes	No	Yes
Bitstamp	0.5%	0.5%	No	No	Yes	No	Yes
Bittrex	0.35%	0.35%	No	No	Yes	No	Yes
Bitmex	0.025%	0.075%	No	No	No	No	Yes
BTC Markets	0.05%	0.2%	No	No	Yes (AUD Free)	No	Yes
Bybit.com	-0.025% (Rebate)	0.075%	No	No	No	No	No
CEX.IO	0.16%	0.25%	No	No	Yes	No	Yes
Coinbase	N/A	The greater of flat fee ($1.49, $1.99 & $2.99) or 1.49%	0.50% fiat 1.00% crypto	No	No	No	Yes
Coinbase Pro	0.5%	0.5%	No	No	No	No	Yes
crypto.com	0.1%	0.16%	No	No	Yes	No	Yes
Gemini	The greater of flat fee ($0.99, $1.49, $1.99 & $2.99) or 1.49%	The greater of flat fee ($0.99, $1.49, $1.99 & $2.99) or 1.49%	No	No	No	No	Yes
HitBTC	0.1%	0.25%	No	No	No	No	Yes
Huboi	0.2%	0.2%	No	No	No	Yes	Yes
Kraken	0.16%	0.26%	No	No	No	No	Yes
Liquid	0.29%	0.29%	No	No	Yes	Yes	Yes

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[25]Text taken from Stone 2022.

Table 9: Bunching in Threshold-Screening Exchanges

	Bitcoin			Ethereum		
	USD	*EUR*	*YEN*	*USD*	*EUR*	*YEN*
Threshold	1.664**	0.520	6.706***	2.446***	1.133***	−1.105
	(0.566)	(0.564)	(1.510)	(0.471)	(0.360	(0.763)
Placebo 1	1.425	0.446**	5.288	0.195	0.039	−1.214
	(1.733)	(0.188)	(2.798)	(0.597)	(0.288)	(1.201)
Placebo 2	−0.077	0.022	14.578	0.419	0.223	1.475*
	(0.271)	(0.107)	(10.499)	(0.989)	(0.247)	(0.666)
N (Threshold)	161,605	1,180,226	2,431,032	63,760	879,692	59,978
N (Placebo 1)	137,822	1,302,271	5,007,865	129,240	1,103,333	143,507
N (Placebo 2)	74,794	399,601	804,864	23,049	365,390	45,270
Exchanges	2	1	4	2	2	3
Pairs	5	3	6	2	4	3
Countries	1	1	1	1	2	1

Notes: Bunching estimates in exchanges with threshold-based screening in the 70 dollars/euros (70,000 yen) below the threshold. N denotes number of transactions, *Exchanges* denotes number of exchanges, and *Pairs* denotes number of trading pairs; standard errors are in parentheses. Stars indicate statistical significance at *p<0.05; **p<0.01; ***p<0.001.

E   Robustness

Table 9 presents estimates of bunching with an alternate specification of the bunching window – 70 dollars/euros (70,000 yen) below each threshold – as a robustness check. Once again, bunching is positive and significant across transactions from Bitcoin and Ethereum to dollars, Bitcoin to yen, and Ethereum to euros. Similarly, bunching is not significant in transactions from Ethereum to yen. These results are similar to the estimates presented in Table 1, underscoring the robustness of these results.

F   Pre-Trends for Difference-in-Differences Estimation

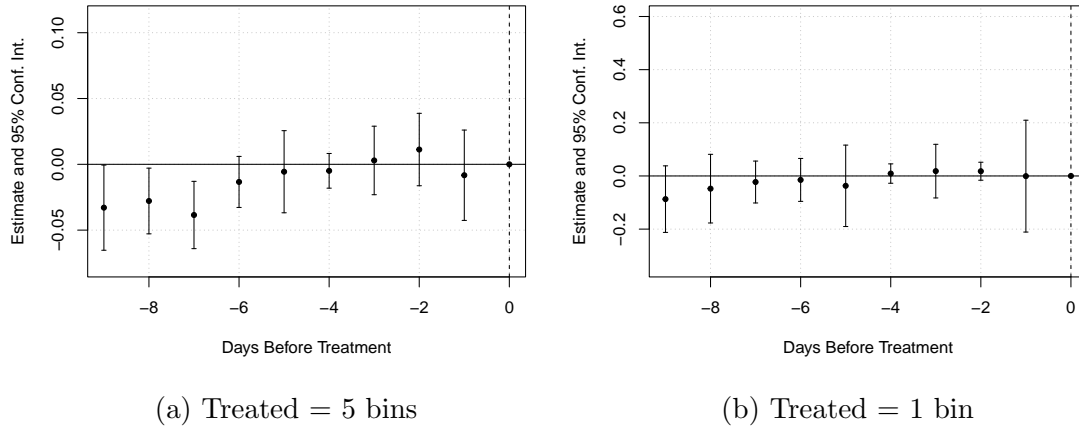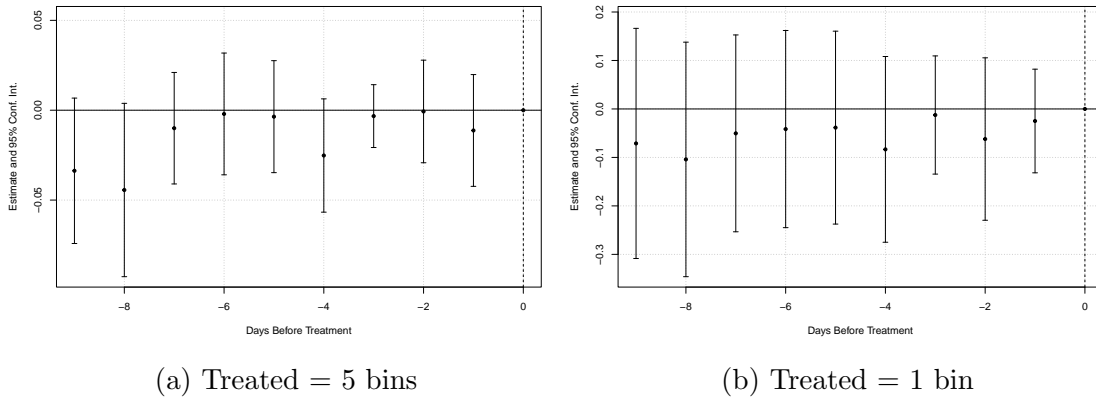Figure 3: Pre-Trends: Bitcoin Trades in British Virgin Islands and Unregulated Exchanges

(a) Treated = 5 bins

(b) Treated = 1 bin

Figure 4: Pre-Trends: Ethereum Trades in British Virgin Islands and Unregulated Exchanges

(a) Treated = 5 bins

(b) Treated = 1 bin

Figures present a comparison of pre-trends in the proportion of trades in 1 or 5 bins below the threshold between British Virgin Islands and unregulated exchanges before the introduction of new regulatory standards in the British Virgin Islands on July 10, 2020.

Table 10: Difference-in-Differences Estimation Below $500 Placebo Threshold

	Proportion of Trades in Bin			
	Bitcoin		Ethereum	
	Range: 50 bins below threshold (1)	*Range: 10 bins below threshold* (2)	*Range: 50 bins below threshold* (3)	*Range: 10 bins below threshold* (4)
Treated	0.016***	0.022**	0.015***	0.013**
	(0.005)	(0.007)	(0.004)	(0.005)
Time	−0.015**	0.002	−0.014*	−0.001
	(0.005)	(0.012)	(0.005)	(0.006)
Treated × Time	−0.007	−0.011	−0.004	−0.001
	(0.004)	(0.007)	(0.004)	(0.005)
Day FEs	✓	✓	✓	✓
Bin-Pair FEs	✓	✓	✓	✓
N	2,040	408	1,275	255
R^2	0.229	0.534	0.283	0.358
Adjusted R^2	0.194	0.457	0.238	0.180

Notes: Unit of observation is at the day-bin-trading pair level. Models are clustered by trading pair with robust standard errors. Placebo threshold of 500 dollars. 07/01 - 08/22. Stars indicate the statistical significance level: *$p<0.05$; **$p<0.01$; ***$p<0.001$.

G   Difference-in-Differences Estimation Below Placebo Thresholds

Table 11: Difference-in-Differences Below $1,500 Placebo Threshold

	Proportion of Trades in Bin			
	Bitcoin		Ethereum	
	Range: 50 bins below threshold (1)	*Range: 10 bins below threshold* (2)	*Range: 50 bins below threshold* (3)	*Range: 10 bins below threshold* (4)
Treated	0.004	0.030*	0.002	0.015**
	(0.007)	(0.013)	(0.010)	(0.005)
Time	−0.004	0.048*	−0.006	0.051
	(0.008)	(0.023)	(0.013)	(0.051)
Treated × Time	0.006	−0.004	0.010	−0.006
	(0.004)	(0.011)	(0.011)	(0.006)
Day FEs	✓	✓	✓	✓
Bin-Pair FEs	✓	✓	✓	✓
N	2,040	408	1,275	255
R^2	0.122	0.310	0.092	0.247
Adjusted R^2	0.081	0.195	0.035	0.039

Notes: Unit of observation is at the day-bin-trading pair level. Models are clustered by trading pair with robust standard errors. Placebo threshold of 1,500 dollars. 07/01 – 08/21. Stars indicate the statistical significance level: *p<0.05; **p<0.01; ***p<0.001.

Table 12: Bunching Before and After Regulatory Change in British Virgin Islands

	Bitcoin		Ethereum	
	Before	After	Before	After
500	5.051*	−0.088	5.684***	−0.383
(*Placebo*)	(2.326)	(2.040)	(1.751)	(0.782)
1,000	3.680***	3.146***	3.524	2.671***
(*Threshold*)	(0.475)	(1.771)	(0.924)	(0.645)
1,500	−4.661***	−0.511	3.235	−0.454
(*Placebo*)	(0.571)	(0.366)	(2.014)	(1.282)
N (500)	15,149	101,523	16,635	107,025
N (1,000)	20,903	116,790	4,189	56,844
N (1,500)	5,984	55,521	1,609	20,489
Exchanges	2	2	2	2
Pairs	4	4	2	2

Notes: Bunching in regulated and unregulated exchanges by trading pair between 06/21/20 and 09/02/20. Pairs denotes the number of trading pairs and exchanges denotes the number of exchanges included in each estimate; standard errors are in parentheses and stars indicate the statistical significance level: *p<0.05; **p<0.01; ***p<0.001.

H   Bunching in British Virgin Islands Exchanges

Table presents bunching estimates below the screening threshold ($1,000) and two placebo thresholds ($500 and $1,500) for British Virgin Islands exchanges before and after the introduction of new regulatory standards on July 10, 2020.

I Fake Data

Typical transaction data from cryptocurrency exchanges feature bunching at round quantities of cryptocurrency or values of fiat currency as well as other types of anomalies (see Section J). I suspect that four exchanges in the sample feature fake transaction data as the distributions resemble an exponential distribution or other unusual distribution. Figure 5 shows distributions for trading pairs in Coinsbit, Figure 6 for pairs in Cryptology, Figure 7 for pairs in Folgory, and Figure 8 for pairs in Whitebit. All of these exchanges were registered in Estonia during the data collection period. Importantly, excluding these trading pairs from the analysis does not significantly affect the results, as the majority of these trading pairs did not have significant trading activity in the 500-dollar window around the 1,000 dollar/euro screening threshold.

Figure 5: Coinsbit
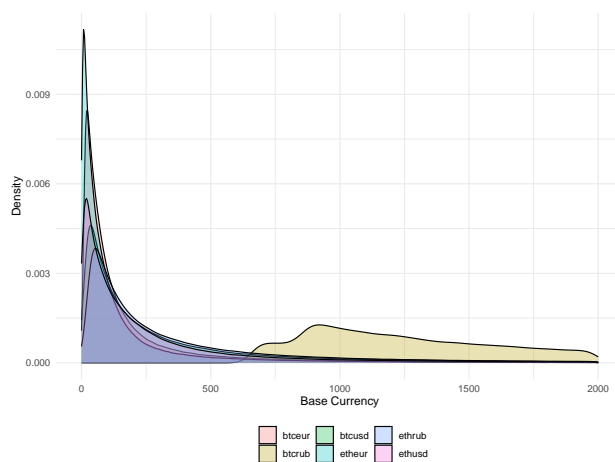
The graphs show that trading pairs in Coinsbit, Cryptology, and Whitebit resemble an exponential distribution, while trades in Folgory feature an unusual pattern in which the number of transactions decrease significantly past a certain fiat value. Further, the trading pairs within each exchange follow a similar distribution, which is unusual as there is often
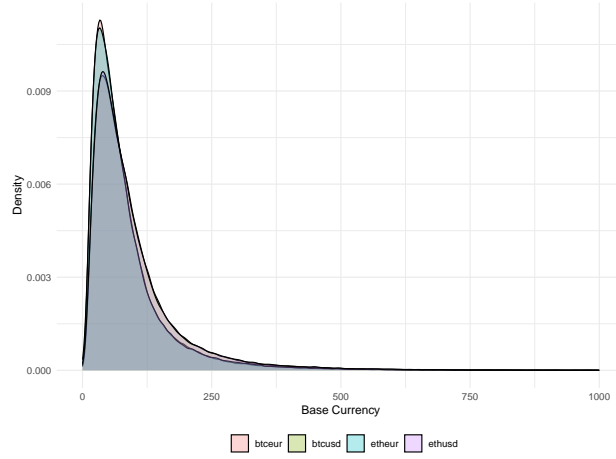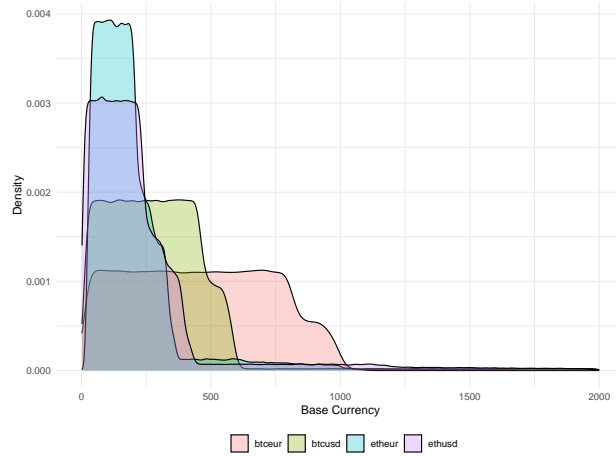
Figure 6: Cryptology

Figure 7: Folgory

variation in the distributions of transactions across trading pairs.[26] For a more detailed discussion of fake transaction volume within exchanges, see Chen, Lin, and Wu (2022).

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[26]For example, many exchanges feature higher transaction volumes for cryptocurrency trades to dollars or euros, which often results in a different distribution of transactions for these trading pairs than trades to other fiat currencies.

Figure 8: Whitebit
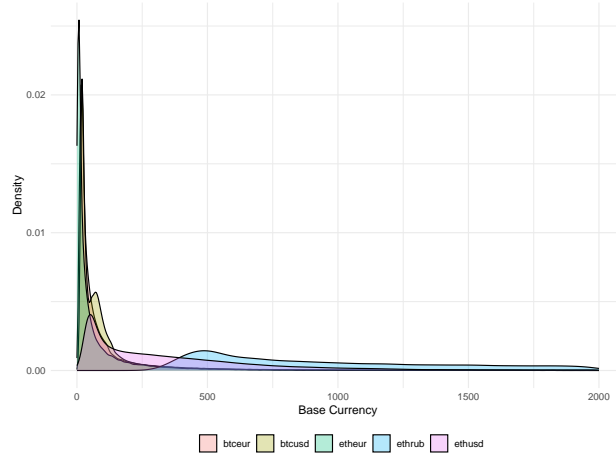
J   Distributions in Regulated and Unregulated Exchanges

Figures 9a and   9b show the distributions for Bitcoin transactions in regulated and un-regulated exchanges, respectively. Figure 9a excludes one outlier exchange, but this graph including the outlier is presented in Figure 10.

Figure 9: Distributions for Bitcoin Transactions

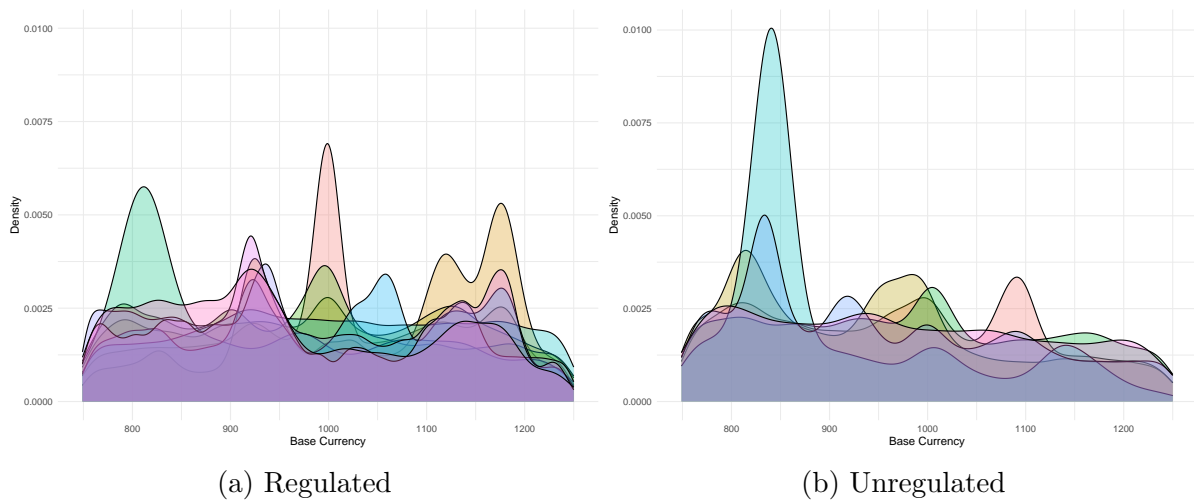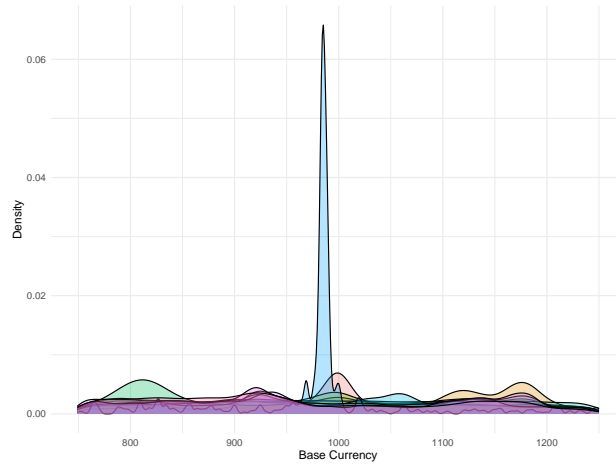(a) Regulated   (b) Unregulated

Figure 10: Distributions for Bitcoin Transactions with Outlier Exchange

Figures 11a and 11b show the distributions for Ethereum transactions in regulated and unregulated exchanges, respectively.

Figure 11: Distributions for Ethereum Transactions

(a) Regulated

(b) Unregulated