# Crypto Market Responses to Digital Asset Policies

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#### Abstract

We construct daily databases of crypto bans and policy statements concerning central bank digital currencies (CBDCs) to estimate their effect on crypto trading volumes for an unbalanced panel of 116 countries from November 2016 to December 2021. We find that trading volume falls by up to 55% in the week after the announcement of a ban, and by up to 25% after a CBDC-supportive speech by senior central bank officials. For the strictest bans, this reduction persists over the subsequent quarter, driven by a reduction in trading by institutional investors. The results suggest that crypto market participants pay significant attention to government policy on digital assets.

Keywords: Crypto assets; Central Bank Digital Currency; Regulation.

JEL: G12; G14; G18.

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### 1 Introduction

The rapid rise of crypto assets has been accompanied by widespread policy discussions on whether and how governments should respond. To date, more than 50 countries have introduced some form of ban on crypto activity (Library of Congress 2021), while others have introduced new taxes on crypto transactions and profits.<sup>1</sup> Prompted by new forms of private digital money, such as Facebook's Diem (formerly Libra) and US dollar-denominated stablecoins, a full 80% of surveyed central banks are engaged in research, experimentation, or development of digital currencies (Auer et al. 2020).<sup>2</sup>

How do crypto markets, in turn, respond to government policies on digital assets? In this paper, we examine the response of country-level trading volumes to announcements about two policy levers: (i) regulatory tightening—that is, crypto 'bans', whereby the government introduces new regulation or reinterprets existing regulation to prohibit some set of activities involving crypto assets; and (ii) central bank digital currency (CBDC) projects, where the government undertakes to provide an alternative digital asset, whose properties may make it more attractive for some users.<sup>3</sup> These two policy instruments are not mutually exclusive—crudely, the regulatory 'stick' could be complemented by a CBDC 'carrot' to reduce both access to, and demand for, crypto assets.

We construct a novel daily database of crypto bans and extend the Auer et al. (2020) database of CBDC announcements to a daily frequency. We combine these with data on daily crypto trading volumes from CryptoCompare, resulting in an unbalanced panel of 116 countries from November 2016 to December 2021. Applying Jorda (2005) local projection method, we find significant declines in crypto trading volumes in the week after such announcements, of up to 55% after a ban is announced and up to 25% after a CBDC-supportive speech by senior central bank officials. Volumes thereafter return to their previous levels, except in the case of the strictest bans where trading remains significantly lower over the subsequent quarter, driven by a reduction in trading by institutional investors. Overall, these results suggest that crypto market participants pay significant attention to government policy on digital assets. Our analysis complements previous work examining specific regulatory events (e.g., Borri & Shakhnov 2020) and impacts on global crypto price time series (Shanaev et al. 2020, Chokor & Alfieri 2021) or the non-crypto financial sector (Burlon et al. 2022, Wang et al. 2022).

<sup>&</sup>lt;sup>1</sup>This partly reflects fears of 'cryptoization' or 'stablecoin dollarization', particularly in developing countries (International Monetary Fund 2021).

<sup>&</sup>lt;sup>2</sup>Anecdotal evidence from crypto-focused news websites suggests that crypto market participants are in turn highly attuned to CBDC developments (see e.g. https://www.coindesk.com/search?s=cbdc).

<sup>&</sup>lt;sup>3</sup>Cong & Mayer (2022) provide a theoretical argument for CBDC-crypto substitution effects, on the assumption that holding money in digital form has some convenience yield (e.g., cheaper or faster transactions) which rises over time as technology improves. This implies that in the long run all money is digital, and a higher share for CBDC lowers the share for crypto assets. However, countervailing mechanisms are possible, for instance where CBDCs are seen to legitimize digital money and so attract more users to also purchase crypto assets. Our analysis therefore reflects the net impact of such mechanisms.

#### 2 Data & Methodology

We construct a country-daily database of crypto bans by building on the Library of Congress (2021) survey of the legal status of crypto assets by country. This cross-country survey does not include precise dates for the bans, so we manually identify the date that the ban was implemented, or the date that it was announced if different.<sup>4</sup> We also use the Library of Congress survey's distinction between absolute bans and 'implicit' bans—such as banning crypto asset exchanges, or prohibiting banks from dealing in crypto assets or offering services to individuals and businesses dealing in crypto assets.

The main source of data on CBDC-related announcements is Auer et al. (2020), who classify speeches by central bank governors and board members as positive, neutral or negative. Specifically, a speech is assigned a value of: -1 if it has a clear negative viewpoint on CBDCs or explicitly states that there is no plan at present to issue a CBDC; +1 if a speech is clearly positive in tone, or announces that a project or pilot has been launched or is in the pipeline; and 0 otherwise. We use the version of the country-month dataset updated in January 2022 and extend it to the country-daily frequency by manually tracing the exact date on which each speech was given.<sup>5</sup>

Our primary source of crypto volume data is CryptoCompare, which aggregates trading data from 300 crypto exchanges around the world. We use daily data from September 2016 to January 2022, and gauge country-wise crypto transaction volumes by focusing on fiat-crypto trades, which allow us to associate the transaction with the country issuing the fiat currency. We also complement this data from exchanges with on-chain data, i.e. scraped transactions, provided by Chainalysis at monthly frequency from April 2019 to August 2021.<sup>6</sup> Chainalysis's algorithm assigns transactions to countries by matching crypto wallet addresses to IP addresses (Chainalysis 2021).<sup>7</sup>

Figure 1 shows the global trends in our data. Panel (A) shows the familiar explosive growth in crypto trading, measured in both number and volume of transactions. Panel (B) shows the takeoff of both crypto bans and CBDC speeches over the same period. The red lines show the growth of crypto bans, including a small number of the strictest 'absolute' bans. The blue line shows the rapid growth in interest in CBDCs, where initially governments tended to take a negative stance

<sup>&</sup>lt;sup>4</sup>Specifically, we manually trace the earliest online mention of the ban, starting by following the links in the Library of Congress survey but also by, for instance, directly querying news websites. We then use the content and context of the mention (e.g. in news reports or legislation) to assign announcement and implementation dates.

<sup>&</sup>lt;sup>5</sup>The data on crypto bans and CBDC announcements are reported in the Online Appendix and are also available in CSV format at https://copestake.info/uploads/bandates.csv and https://copestake.info/uploads/speechdates.csv.

<sup>&</sup>lt;sup>6</sup>Both platforms convert and aggregate trading volumes from various currencies into comparable USD using contemporaneous exchange rates.

<sup>&</sup>lt;sup>7</sup>While the use of virtual private networks (VPNs) could distort this to some extent, such distortions are likely to be small—Chainalysis uses hundreds of millions of transactions, so VPN usage would have to be very widespread to meaningfully affect the results.

in speeches before turning increasingly positive since 2019. Table 1 provides summary statistics on the countries in our study, distinguishing between countries with/without bans and countries with/without CBDC initiatives, where the latter is defined as having at least one positive CBDC speech in our dataset. Interestingly, CBDCs tend to be favored by richer and bans by poorer countries, likely reflecting both the higher capacity of more advanced countries' central banks and the greater threats of cryptoization or stablecoin dollarization faced by poorer countries with weaker governance and less stable currencies.



FIGURE 1: Global crypto trading volumes, bans and CBDC speeches

*Notes:* The left-hand graph shows total crypto transaction and trading volumes across all countries in our dataset. The right-hand graph shows the cumulative count of CBDC speeches across all countries in the sample over time, counting negative speeches as -1 and neutral speeches as zero, and the cumulative counts of crypto ban events, both for any bans and for absolute bans only. *Sources:* Auer et al. (2020), Library of Congress (2021), CryptoCompare, Chainalysis.

To investigate the dynamic response of crypto markets to policy announcements, we use the local projection method of Jorda (2005) and estimate two specifications, one using daily data—which gauges the short-term effects—and one using monthly data—which captures more persistent effects. The first specification is:

$$y_{c,t+h} - y_{c,t-1} = \alpha_c^h + \alpha_t^h + \alpha_{DoW}^h + \beta^h E_{c,t-1} + \sum_{k=1}^7 \gamma_k^h E_{c,t-k-1} + \sum_{k=0}^h \mu_k^h E_{c,t+k} + \sum_{k=1}^7 \delta_k^h \Delta y_{c,t-k} + u_{c,t-1} + \sum_{k=1}^7 (1) \delta_k^h \Delta y_{c,t-k} + u_{c,t-1} + u_{c$$

	CBDC only	Both CBDC & Bans	Bans only	Neither
Number of countries	18	2	20	76
GDP per capita ( $2017 \text{ US}$ )	$46,\!553$	41,328	8,325	$11,\!943$
Inflation rate (percent)	2.9	3.1	3.8	4.3
Trust in government (percentile)	91	81	30	43
Control of corruption (percentile)	90	70	29	47

TABLE 1: Characteristics of the countries in the baseline sample

*Notes:* This table shows the characteristics of the countries announcing bans and/or CBDC projects in our baseline sample. All values are cross-country medians, except for the number of countries in each group. *Sources:* Auer et al. (2020), Library of Congress (2021), IMF, World Bank.

where:  $y_{c,t+h}$  is log trading volume in country c at time t and horizon h days ahead, measured in USD;  $\alpha_c^h$ ,  $\alpha_t^h$  and  $\alpha_{DoW}^h$  are country, time and day-of-the-week fixed effects; and  $E_{c,t-1}$  is the ban/CBDC dummy, lagged by one day to preclude reverse causality and measurement errors associated with the unknown time of the speech during the day.<sup>8</sup> The coefficient of interest  $\beta^h \times 100$  therefore measures the percent change in volume h days after the event, in countries with a ban or positive CBDC announcement, relative to the counterfactual in which there was no such event. The fifth term  $\sum_{k=1}^{7} \gamma_k^h E_{c,t-k-1}$  includes seven lags of the main relationship to control for recent events, the sixth term  $\sum_{k=0}^{h} \mu_k^h E_{c,t+k}$  includes a full set of leads to control for contemporaneous or upcoming events, and the seventh term  $\sum_{k=1}^{7} \delta_k^h \Delta y_{c,t-k}$  includes seven lags of the outcome variable to control for pre-existing trends. We use robust standard errors in our baseline, and our results are robust to using Driscoll-Kraay standard errors or clustering at the country level, as discussed in the Online Appendix.

The specification using monthly data is similar to equation 1, except with t and h measured in months, no day-of-the-week fixed effect, and two months' worth of lags instead of seven days:

$$y_{c,t+h} - y_{c,t-1} = \alpha_c^h + \alpha_t^h + \beta^h E_{c,t} + \sum_{k=1}^2 \gamma_k^h E_{c,t-k} + \sum_{k=1}^h \mu_k^h E_{c,t+k} + \sum_{k=1}^2 \delta_k^h \Delta y_{c,t-k} + u_{c,t}$$
(2)

For this specification, we can use Chainalysis data in addition to CryptoCompare, which also allows us to run this specification separately on alternative sub-categories G of crypto trading volumes  $y_{c,t}^G$ .

<sup>&</sup>lt;sup>8</sup>Specifically, the ban variable equals one on ban announcement days, while the CBDC variable is a symmetrical dummy that equals +1 on the day of a CBDC-supportive speech, equals -1 on the day of a CBDC-negative speech, and equals 0 otherwise, as described above.

Specifically, Chainalysis use average transaction sizes to classify participants into one of five groups:

 $G = \begin{cases} \text{Small retail, for transactions } <\$1k \\ \text{Large retail, for transactions between }\$1k-\$10k \\ \text{Professional, for transactions between }\$10k-\$1M \\ \text{Institutions, for transactions between }\$1M-\$10M \\ \text{Large institutions, for transactions }>\$10M \end{cases}$ 

This allows us to examine heterogeneous effects across investor types, as discussed below.

### 3 Results

Figure 2 shows the daily response of crypto trading volumes to CBDC and ban announcements. Positive CBDC speeches and regulatory tightening are respectively associated with up to 25% and 55% lower growth in trading volumes during the subsequent week, relative to the counterfactual in which there was no such announcement. Given the large set of controls in our specification, and the volatility of the underlying crypto market, the fact that we detect a significant response is striking. The size of the effect is modest but economically meaningful, with the reductions mentioned above corresponding to declines of 0.2 and 0.5 standard deviations over the respective horizons. These results are robust to a range of alternative specifications, including clustering at the country level, winsorizing the top and bottom 1% of crypto volumes, using Driscoll-Kraay standard errors, using levels rather than changes in the outcome variable, using ten lags of the main variables, adding a country-wise quadratic trend, and using implementation rather than announcement dates where they differ (see the Online Appendix for details).

Since these responses are simply to CBDC-supportive *speeches*, not (in the vast majority of cases) the launch of a live CBDC, we would not expect to see persistent effects. Most CBDC projects are at far too nascent a stage to have had any major impacts on the real economy (Auer et al. 2021). Similarly, most crypto bans are 'implicit' bans, as seen in Figure 1, which in many cases simply consisted of announcements clarifying that various transactions involving crypto assets are forbidden under existing regulations.<sup>9</sup> Our specification using monthly data corroborates this intuition: Figure 3 finds almost no significant effects in the quarter following the policy event.

However, the strictest 'absolute' bans *would* be expected to have a persistent effect. Figure 4 shows the responses of trading volumes to absolute bans, both on centralized exchanges (from CryptoCompare) and on chain (from Chainalysis). In both cases, we find significant declines in the quarter after the ban, with maximum effects of 70% and 39% respectively, which correspond

 $<sup>^{9}</sup>See,~for~example,~announcements~in~Tanzania~https://perma.cc/ZGY7-FFPY,~the~Maldives https://perma.cc/UN4D-8QKM and Nigeria https://perma.cc/4QSS-MGVK.$ 



FIGURE 2: Short-term responses of crypto markets to CBDC and ban announcements

*Notes:* These graphs show the percentage point response to CBDC/ban announcements of crypto trading volumes on CryptoCompare. The dashed and dotted lines show the 90% and 68% confidence intervals respectively.



FIGURE 3: Medium-term responses of crypto markets to CBDC and ban announcements

*Notes:* These graphs show the percentage point response to CBDC/ban announcements of crypto trading volumes on CryptoCompare. The dashed and dotted lines show the 90% and 68% confidence intervals respectively.

to reductions in volume changes of 0.6 and 0.4 standard deviations.<sup>10</sup> Disaggregating the on-chain impact across investor categories G, by using transaction size as a proxy as described in the previous section, we find that this effect is driven by a reduction in trading among the largest crypto investors (Figure 5). Specifically, the maximum impact is 0.4 standard deviations among both 'professional' and 'institutional' investors, and 0.7 standard deviations in the 'large institutions' category. These groups are highly influential in crypto markets, with 'large institutions' alone accounting for one third of the total trading volume in our data for 2021. Their large transaction sizes and trading volumes also make these groups most easily traceable by government, strengthening the incentive to comply with bans.

FIGURE 4: Medium-term responses of crypto markets to absolute bans



*Notes:* These graphs show the percentage point response to absolute crypto bans of crypto trading volumes in the CryptoCompare and Chainalysis datasets respectively. The dashed and dotted lines show the 90% and 68% confidence intervals respectively.

## 4 Conclusion

We investigate crypto markets' responses to policy announcements concerning digital assets. We find a reduction in crypto trading volumes immediately after the announcement of both regulatory tightening and support for the development of a CBDC. While volumes thereafter generally return to their previous growth path, the strictest bans have a persistent effect over the subsequent quarter, driven by a reduction in trading by institutional investors. We conclude that crypto market participants pay significant attention to government policy on digital assets, particularly the most sophisticated investors. Looking ahead, institutional investors are becoming increasingly important

<sup>&</sup>lt;sup>10</sup>We speculate that the impact is larger for centralized exchanges than for on-chain transactions because large centralized exchanges are comparatively easier to identify and sanction.



FIGURE 5: Medium-term responses of crypto markets to absolute bans

#### (A) Small retail (<\$1k) (B) Large retail (\$1k-\$10k)

*Notes:* These graphs show the percent responses to absolute crypto bans of crypto trading volumes among different investor categories in the Chainalysis data. Investor categories are identified using the average size of transactions (noted in parentheses for each group) as a proxy. The dashed and dotted lines show the 90% and 68% confidence intervals respectively.

in crypto markets (Auer et al. 2022, Huang et al. 2022), suggesting that this scrutiny will only increase.

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#### SUPPLEMENTARY ONLINE APPENDIX

This supplementary appendix includes a complete list of our policy events and a range of robustness checks. First, Tables I and II in turn list the daily ban and CBDC speech events compiled for the paper, building upon Library of Congress (2021) and Auer et al. (2020) respectively. For the benefit of future researchers we include the maximum time and country spans available, even though our empirical results use only a subset of these (as in Table 1 in the main paper) due to the limited availability of corresponding crypto trading data.

Second, this appendix provides figures demonstrating that our main results also hold under a range of alternative specifications. Figures I and II show that our findings are qualitatively unaffected by, in turn: (I.A) clustering at the country level, (I.B) winsorizing the top and bottom 1% of crypto volumes, (I.C) using Driscoll-Kraay standard errors, (II.A) using levels  $y_{c,t+h}$  rather than changes  $y_{c,t+h} - y_{c,t-1}$  in the outcome variable, (II.B) including ten rather than seven lags of the dependent and independent variables, and (II.C) including a country-wise quadratic time trend as an additional control.

Finally, Figure III repeats the core crypto ban results from the main text (Figure 2 Panel B, Figure 3 Panel B and Figure 4), but using implementation dates rather than announcement dates where they differ. As noted in the main text, many of the announcements (such as those in footnote 9) take place with immediate effect, as they are effectively clarifying that various transactions involving crypto assets are forbidden under existing regulations, where this had not previously been explicit due to the nascency of the asset class. The implementation date therefore differs from the announcement date in only a small number of cases in our dataset, so Figure III shows very similar results to those presented in the main text.

Country	ISO-2	Date	Date announced	Ban type
Algeria	DZ	12/27/17	10/27/17	absolute
Bangladesh	BD	9/15/14	9/15/14	implicit
Bangladesh	BD	12/24/17	12/24/17	absolute
Bangladesh	BD	7/29/21	7/29/21	implicit
China	CN	9/15/17	9/4/17	implicit
China	CN	9/24/21	9/15/21	absolute
Egypt	EG	12/28/17	12/28/17	implicit
Egypt	EG	1/10/18	1/10/18	implicit
Egypt	EG	9/15/20	9/15/20	absolute
Iraq	IQ	12/3/17	12/3/17	absolute
Morocco	MA	11/20/17	11/20/17	absolute
Nepal	NP	8/13/17	8/13/17	implicit
Nepal	NP	9/9/21	9/9/21	absolute
Qatar	QA	2/7/18	2/7/18	implicit
Qatar	QA	6/7/20	6/7/20	absolute
Bahrain	BH	1/7/18	1/7/18	implicit
Benin	BJ	3/1/18	3/1/18	implicit
Benin	BJ	6/11/18	6/11/18	implicit
Bolivia	BO	6/5/14	6/5/14	implicit
Bolivia	BO	12/15/20	12/15/20	implicit
Bolivia	BO	5/17/21	5/17/21	implicit
Burkina Faso	BF	6/11/18	6/11/18	implicit
Burundi	BI	9/2/19	9/2/19	implicit
Cameroon	CM	10/23/20	10/23/20	implicit
Central African Republic	$\operatorname{CF}$	10/23/20	10/23/20	implicit
Chad	TD	10/23/20	10/23/20	implicit
Congo	CG	10/23/20	10/23/20	implicit
Cote D'Ivoire	CI	6/11/18	6/11/18	implicit

Table I: List of bans

Country	ISO-2	Date	Date announced	Ban type
Democratic Republic Of Congo	CD	7/7/20	7/7/20	implicit
Ecuador	$\mathbf{EC}$	1/8/18	1/8/18	implicit
Gabon	GA	10/23/20	10/23/20	implicit
Georgia	GE	6/28/19	6/28/19	implicit
Indonesia	ID	12/7/17	12/7/17	implicit
Jordan	JO	2/22/14	2/22/14	implicit
Kazakhstan	ΚZ	6/25/20	6/25/20	implicit
Kuwait	KW	12/18/17	12/18/17	implicit
Kuwait	KW	1/18/18	1/18/18	implicit
Lebanon	LB	12/19/13	12/19/13	implicit
Lesotho	LS	2/7/18	2/7/18	implicit
Libya	LY	5/15/21	5/15/21	implicit
Macao	МО	9/27/17	9/27/17	implicit
Maldives	MV	10/11/18	10/11/18	implicit
Mali	ML	6/11/18	6/11/18	implicit
Moldova	MD	2/15/18	2/15/18	implicit
Namibia	NA	5/2/18	5/2/18	implicit
Niger	NE	6/11/18	6/11/18	implicit
Nigeria	NG	2/5/21	2/5/21	implicit
Oman	OM	12/12/17	12/12/17	implicit
Pakistan	PK	4/18/18	1/13/18	implicit
Palau	$\mathbf{PW}$	3/19/19	3/19/19	implicit
Saudi Arabia	SA	7/4/17	7/4/17	implicit
Senegal	SN	6/11/18	6/11/18	implicit
Tajikistan	ΤJ	3/19/21	3/19/21	implicit
Tanzania	ΤZ	11/12/19	11/12/19	implicit
Togo	TG	6/11/18	6/11/18	implicit
Turkey	$\mathrm{TR}$	4/30/21	4/16/21	implicit

Table I: List of bans (Continued)

Country	ISO-2	Date	Date announced	Ban type
Turkmenistan	ТМ	3/19/21	3/19/21	implicit
United Arab Emirates	AE	12/6/20	12/6/20	implicit
Vietnam	VN	7/21/17	7/21/17	implicit
Zimbabwe	ZW	5/8/18	5/8/18	implicit

Table I: List of bans (Continued)

Source: Library of Congress (2021).

Country	ISO-2	Date	Speech stance
United Kingdom	GB	3/2/16	0
Euro Area	$\mathbf{E}\mathbf{A}$	4/25/16	0
Finland	FI	6/14/16	-1
United Kingdom	GB	6/16/16	-1
Canada	CA	6/17/16	-1
United Kingdom	GB	9/20/16	0
Singapore	$\operatorname{SG}$	11/16/16	1
Sweden	SE	11/16/16	1
Japan	JP	11/18/16	-1
Euro Area	$\mathbf{E}\mathbf{A}$	1/16/17	0
United States	US	3/3/17	-1
Japan	JP	4/21/17	0
Malaysia	MY	5/15/17	0
Germany	DE	6/14/17	0
Czech Republic	CZ	7/11/17	0
Chile	CL	6/29/17	-1
Euro Area	$\mathbf{E}\mathbf{A}$	9/1/17	-1
Germany	DE	9/20/17	-1
United Kingdom	GB	10/6/17	0
Singapore	$\operatorname{SG}$	10/9/17	1

Table II: List of CBDC speeches

Country	ISO-2	Date	Speech stance
Denmark	DK	10/30/17	-1
Barbados	BB	10/3/17	0
Denmark	DK	11/3/17	-1
Euro Area	EA	11/9/17	-1
Euro Area	EA	11/21/17	0
Canada	CA	12/14/17	0
United States	US	11/30/17	-1
Australia	AU	12/13/17	0
Denmark	DK	12/4/17	-1
Euro Area	EA	12/17/17	0
Pakistan	РК	11/21/17	0
Sweden	SE	12/8/17	1
Sweden	SE	1/29/18	0
Euro Area	EA	2/6/18	0
Euro Area	EA	2/8/18	-1
Germany	DE	2/14/18	-1
Czech Republic	CZ	2/27/18	-1
Euro Area	EA	3/13/18	0
United Kingdom	GB	3/2/18	-1
Malaysia	MY	3/22/18	0
Japan	JP	4/16/18	-1
United States	US	5/15/18	-1
Euro Area	EA	5/14/18	-1
Euro Area	EA	5/14/18	0
Germany	DE	5/25/18	0
Thailand	$\mathrm{TH}$	6/5/18	-1
Japan	JP	5/30/18	0
Lithuania	LT	5/16/18	0

Table II: List of CBDC speeches (Continued)

Country	ISO-2	Date	Speech stance
Italy	IT	6/7/18	0
Greece	GR	5/24/18	0
New Zealand	NZ	6/26/18	0
Singapore	SG	6/26/18	1
New Zealand	NZ	9/7/18	0
Thailand	TH	9/15/18	0
Canada	CA	10/1/18	0
Thailand	TH	10/2/18	1
Hong Kong SAR	ΗK	9/21/18	0
Belgium	BE	9/14/18	0
Curacao and Sint Maarten	CBCS	6/29/18	1
Japan	JP	11/20/18	-1
Norway	NO	11/1/18	0
Sweden	SE	11/6/18	1
Euro Area	EA	11/15/18	0
South Africa	ZA	11/27/18	0
Kuwait	KW	11/27/18	1
Belgium	BE	11/30/18	0
United Arab Emirates	AE	12/10/18	1
China	CN	12/17/18	0
Singapore	SG	12/13/18	0
Bosnia and Herzegovina	ВА	11/1/18	0
Norway	NO	2/14/19	1
The Bahamas	BS	3/18/19	1
Euro Area	EA	3/22/19	-1
Thailand	TH	3/27/19	1
Lithuania	LT	4/12/19	0
United Kingdom	$\operatorname{GB}$	6/20/19	0

Table II: List of CBDC speeches (Continued)

Country	ISO-2	Date	Speech stance
Germany	DE	6/21/19	0
Mexico	MX	7/9/19	0
Japan	JP	7/5/19	-1
Thailand	TH	7/18/19	1
Curacao and Sint Maarten	CBCS	6/7/19	0
United Kingdom	GB	8/23/19	0
France	$\mathbf{FR}$	9/17/19	0
Euro Area	EA	9/17/19	0
Chile	$\operatorname{CL}$	9/12/19	0
Singapore	SG	9/19/19	0
France	$\mathbf{FR}$	10/15/19	-1
United States	US	10/16/19	0
Euro Area	EA	10/17/19	1
Euro Area	EA	10/18/19	0
Germany	DE	10/30/19	0
Hong Kong SAR	ΗK	11/6/19	1
France	$\mathbf{FR}$	11/13/19	-1
Norway	NO	11/14/19	0
France	$\mathbf{FR}$	11/21/19	0
Germany	DE	11/22/19	0
Euro Area	EA	11/26/19	0
Ireland	IE	11/29/19	0
Mauritius	MU	12/29/19	1
Euro Area	EA	12/2/19	0
Japan	JP	12/4/19	0
France	$\mathbf{FR}$	12/4/19	0
United States	US	12/3/19	0
Switzerland	CH	12/12/19	1

Table II: List of CBDC speeches (Continued)

Country	ISO-2	Date	Speech stance
Euro Area	EA	12/13/19	0
United States	US	12/18/19	0
Euro Area	EA	12/18/19	0
Canada	CA	12/12/19	0
Euro Area	EA	1/8/20	1
Korea	KR	1/2/20	1
France	$\mathbf{FR}$	1/15/20	1
United States	US	2/5/20	0
Euro Area	EA	2/11/20	1
France	$\mathbf{FR}$	3/3/20	1
United Kingdom	GB	2/28/20	1
Japan	JP	2/27/20	1
Canada	CA	2/25/20	1
China	CN	4/1/20	1
Euro Area	EA	5/11/20	1
United Kingdom	GB	6/11/20	1
Japan	JP	7/29/20	-1
Malaysia	MY	8/6/20	1
Canada	CA	6/16/20	-1
United States	US	8/13/20	1
United Kingdom	GB	9/3/20	0
Euro Area	EA	9/10/20	1
France	$\mathbf{FR}$	9/11/20	1
New Zealand	NZ	7/31/20	-1
Spain	ES	9/25/20	0
Germany	DE	9/10/20	1
Philippines	PH	9/16/20	1
France	$\mathbf{FR}$	10/7/20	1

Table II: List of CBDC speeches (Continued)

Country	ISO-2	Date	Speech stance
Chile	$\operatorname{CL}$	9/2/20	0
Euro Area	EA	10/12/20	0
France	$\mathbf{FR}$	10/7/20	1
United Kingdom	GB	10/13/20	0
New Zealand	NZ	10/19/20	-1
France	$\mathbf{FR}$	10/15/20	1
Germany	DE	10/20/20	0
Euro Area	EA	10/22/20	0
Germany	DE	10/21/20	0
Euro Area	EA	11/2/20	0
Hong Kong SAR	HK	11/2/20	1
Euro Area	EA	11/4/20	0
Switzerland	CH	11/5/20	1
Norway	NO	11/5/20	-1
United Kingdom	GB	11/18/20	0
Japan	JP	11/16/20	0
Canada	CA	11/12/20	1
Italy	IT	11/27/20	0
Germany	DE	11/27/20	1
Euro Area	EA	11/27/20	1
Italy	IT	12/7/20	1
France	$\mathbf{FR}$	12/8/20	1
France	$\mathbf{FR}$	12/10/20	1
Russia	RU	12/8/20	0
Korea	KR	1/4/21	1
Germany	DE	1/28/21	0
Euro Area	EA	2/10/21	1
Germany	DE	2/10/21	0

Table II: List of CBDC speeches (Continued)

Country	ISO-2	Date	Speech stance
Canada	CA	2/10/21	1
United Kingdom	GB	2/17/21	0
Hong Kong SAR	HK	2/26/21	1
Australia	AU	3/15/21	1
Japan	JP	3/16/21	1
United States	US	3/18/21	1
Hong Kong SAR	HK	3/23/21	1
India	IN	3/25/21	1
Singapore	$\operatorname{SG}$	3/25/21	1
Mauritius	MU	4/12/21	1
France	$\mathbf{FR}$	4/8/21	1
United Kingdom	GB	4/21/21	1
Norway	NO	5/11/21	0
Denmark	DK	4/23/21	0
Canada	CA	5/13/21	0
United Kingdom	GB	5/13/21	0
Ireland	IE	5/18/21	0
United States	US	5/24/21	1
Hong Kong SAR	HK	6/8/21	1
Sweden	SE	5/31/21	1
Germany	DE	6/10/21	1
Germany	DE	6/15/21	0
United Kingdom	GB	6/15/21	0
Spain	ES	6/16/21	0
Germany	DE	6/17/21	0
United Kingdom	GB	6/21/21	0
United Kingdom	GB	6/30/21	0
United Kingdom	GB	6/10/21	1

Table II: List of CBDC speeches (Continued)

Country	ISO-2	Date	Speech stance
Finland	FI	7/1/21	0
Italy	IT	6/28/21	1
United States	US	6/28/21	0
France	$\mathbf{FR}$	6/29/21	1
Singapore	$\operatorname{SG}$	6/28/21	0
France	$\mathbf{FR}$	7/12/21	1
Italy	IT	7/12/21	1
Mexico	MX	7/28/21	0
Ireland	IE	7/29/21	1
United States	US	8/5/21	-1
Germany	DE	7/1/21	0
Thailand	TH	8/25/21	1
United Kingdom	GB	9/13/21	0
China	CN	9/18/21	0
Mexico	MX	10/7/21	1
France	$\mathbf{FR}$	9/30/21	1
France	$\mathbf{FR}$	10/11/21	1
France	$\mathbf{FR}$	11/8/21	1
Germany	DE	11/3/21	1
Germany	DE	11/10/21	0
France	$\mathbf{FR}$	11/19/21	1
Spain	ES	11/15/21	0
Italy	IT	11/10/21	0
France	$\mathbf{FR}$	11/25/21	1
Albania	AL	12/6/21	0
Hong Kong SAR	HK	12/9/21	1
Australia	AU	12/9/21	1
Netherlands	NL	12/9/21	0

Table II: List of CBDC speeches (Continued)

Country	ISO-2	Date	Speech stance
China	CN	12/9/21	1
Finland	FI	10/20/21	0
North Macedonia	MK	12/9/21	0
Source: Auer et al. $(2020)$ .			

Table II: List of CBDC speeches (Continued)

FIGURE I: Short-term responses of crypto markets to policy announcements—Robustness 1 (A) Clustering at the country level



Notes: These graphs show the percentage point response to CBDC/ban announcements of crypto trading volumes on CryptoCompare. The dashed and dotted lines show the 90% and 68% confidence intervals respectively. 13

FIGURE II: Short-term responses of crypto markets to policy announcements—Robustness 2 (A) Using levels rather than changes in the outcome variable **CBDC** speeches Bans



Notes: These graphs show the percentage point response to CBDC/ban announcements of crypto trading volumes on CryptoCompare. The dashed and dotted lines show the 90% and 68% confidence intervals respectively.

FIGURE III: Responses of crypto markets to implementation of crypto bans





*Notes:* These graphs show the percentage point response of crypto trading volumes on CryptoCompare (Panels A-C) and Chainalysis (Panel D) to the implementation of bans. These graphs are respectively comparable to Figure 2 Panel B, Figure 3 Panel B, and Figure 4 in the main text. The dashed and dotted lines show the 90% and 68% confidence intervals respectively.

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