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BEHAVIORAL RESPONSES TO CENTRAL BANK DIGITAL CURRENCY ANNOUNCEMENTS IN EMERGING FINANCIAL MARKETS

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ABSTRACT

This descriptive paper analyzes behavioral reactions of investors and financial markets to central bank digital currency (CBDC) announcements in emerging economies. Moreover, as CBDCs become more commonly featured in monetary policy discussions their announcements are likely to affect market also expectations, investor behavior and short-run trading particularly in emerging financial markets that have high informational frictions, policy sensitivity and macroeconomic volatility. The paper applies an event-study methodology to a sample of official CBDC-related announcements by central banks in selected emerging economies over a set period. Market reactions are measured by abnormal stock market returns, currency movement, trading volume and volatility in event windows surrounding announcement dates. Panel regression techniques are used to test the robustness of the analysis, assessing institutional credibility, inflation dynamics, digital financial development and announcement type, as potential determinants of market response in terms of significance (magnitude) and direction. The results show that CBDC announcements have statistically significant yet heterogeneous effects on behaviors. Market reactions are relative to exploratory statements, and consequently more pronounced for pilot-stage/implementation-oriented announcements; countries with lower policy credibility/higher macroeconomic uncertainty provide stronger volatility/sentiment dynamics. This find creates

a bridge in the literature between the impact of digital currency policy communication, behavioral finance in emerging markets (with an emphasis on China), and introduces some real effects this policies can generate within investors' expectations suggesting that if you have been vocally defending against BCTs and ghost currencies leading to a crypto panic then everything should be directed to clear and credible central bank communication which is key in reducing uncertainty mitigating investor expectations ultimately stabilizing the financial market.

KEYWORDS: Central Bank Digital Currency (CBDC); Behavioral Finance; Investor Behavior; Financial Market Reactions; Emerging Markets; Event Study Methodology; Abnormal Returns; Market Volatility.

INTRODUCTION and background related to the study

The view that central bank digital currencies (CBDCs) have evolved from a no-op and conceptual policy novelty at least in their form of direct liability balance Sheets with private sector agents to arguably one of the top items on monetary, payments and financial-stability debate agendas has surfaced most prominently in emerging markets where it seems policymakers often regard CBDC as instruments to update payment systems, widen financial inclusion, bolster monetary sovereignty, enhance cross-border payment efficiency or counterbalance the emergence of private digital payment platforms/crypto assets; indeed international momentum appears strong: according to a tracker by the Atlantic Council as of July 2025 at least 137 countries / currency unions representing around 98% of world GDP were exploring a CBDC with at least 72 already at advanced stages such as development, pilot or launch while BIS' s 2024 survey of central banks published in June 2025 found that fully91 per centof93 surveyed central banks were working on either retail CBDC or wholesale CBD. Global Economic Prospects only release inventories once per year. That means that, even before we implement anything, announcements matter: financial markets respond not just to policy outcomes but to signals of future regulation, institutional credibility, technology adoption and possible reallocations of banking and payment intermediation; in fact new evidence from the BIS shows that central bank– and media sentiment on CBDCs has measurable market effects; more positive central bank CBDC sentiment is associated with negative returns in crypto markets and weaker stock performance among banking- and payments-related firms — meaning communication itself can shape investor expectations and portfolio reallocation (BIS 2025b). These dynamics are particularly

relevant to emerging financial markets, which may be more reactive to news regarding policy, and also experience greater exposure to exchange-rate and capital-flow pressures, not least while digital finance is also experiencing rapid growth: the World Bank's Global Findex 2025 finds that globally 79% of adults now have a financial account and 86% own a mobile phone both of which point under increasing salience for digital monetary infrastructure evidence from the IMF then illustrates how within days even the share prices or portfolio flows in these economies may respond to policy and economic news (IMF, 2023; World Bank, 2025). The present empirical study responds to this clear research gap, as evidence of the relationship between CBDC announcements and abnormal returns (eg some preceding studies in non-emerging/developing economies) is still limited; it raises three questions: do announcements generate abnormal returns; do they affect underlying volatility and trading activity; are there reactions that are stronger when institutional trust is low (and/or inflation high), or where payment systems are less digital (and/or less developed); employed an event-study framework with panel regressions on official CBDC announcements and market indicators drawn from a multi-country emerging-markets sample to provide new insights into the relationships between central bank communication, digital money, and behavioral finance in context where public signalling may have outsized effects on markets (BIS, 2025b; IMF, 2025).

Literature Review

The literature on central bank digital currencies (CBDCs) increasingly positions them as a major form of monetary innovation because a CBDC is generally defined as a digital liability of the central bank that can be designed for retail use by the public or for wholesale settlement among financial institutions, with current policy work showing that retail models are often associated with payment efficiency, inclusion, and monetary sovereignty goals while wholesale models are linked more strongly to settlement efficiency, tokenization, programmability, and cross-border market infrastructure modernization, and this distinction has become increasingly salient as the Bank for International Settlements reported from its 2024 survey of 93 central banks that 91% were exploring retail CBDC, wholesale CBDC, or both, with wholesale initiatives advancing especially rapidly and many emerging-market central banks emphasizing domestic payment modernization and cross-border use cases (Illes et al., 2025); in emerging markets specifically, the policy motivations behind CBDC exploration are often broader than those in advanced economies because CBDCs are discussed not only as payment innovations but also as tools that may signal state capacity,

monetary reform, inclusion of underserved users, resilience against dollarization or cryptoisation, and greater control over rapidly digitizing financial systems, while the Atlantic Council's global tracker shows that by mid-2025 most economies, including a large share of emerging markets, were already beyond the purely conceptual stage of CBDC consideration (Atlantic Council, 2025); from the perspective of financial-market research, announcements matter even before implementation because the event-study literature on central bank communication shows that markets respond powerfully to policy words, not merely policy actions, and recent high-frequency evidence continues to demonstrate that communication events transmit monetary and financial information into yields, asset prices, and volatility, with post-announcement interpretation depending on credibility, clarity, and surprise content (Acosta et al., 2025; Blinder et al., 2022); this signaling logic is especially important in developing and emerging markets, where central bank communication has improved substantially but policy messages still operate in settings marked by higher macroeconomic uncertainty, exchange-rate sensitivity, and variable institutional trust, all of which can magnify how investors interpret novel announcements such as CBDC pilots, regulatory frameworks, or implementation roadmaps (Evdokimova et al., 2023); moreover, a behavioral-finance perspective suggests that such announcements may trigger overreaction or underreaction when investors face unfamiliar policy innovations, while ambiguity aversion can intensify responses when the quality, timing, or implications of the information remain uncertain, and sentiment and attention can further amplify price effects in news-sensitive environments, especially where retail participation is meaningful and herding becomes a channel through which policy signals spread across the market (Barberis & Thaler, 2003; Dimmock et al., 2019; Guo et al., 2024; Lucca & Moench, 2025); accordingly, the literature implies a clear empirical gap: although CBDC policy work is accelerating, there is still limited direct evidence on whether CBDC announcements in emerging markets generate abnormal returns, abnormal trading volume, volatility shifts, or sentiment-driven cross-market reactions, which justifies a dedicated empirical study linking digital-currency communication, central bank signaling, and investor behavior in emerging financial systems.

Empirical Gap related to the study

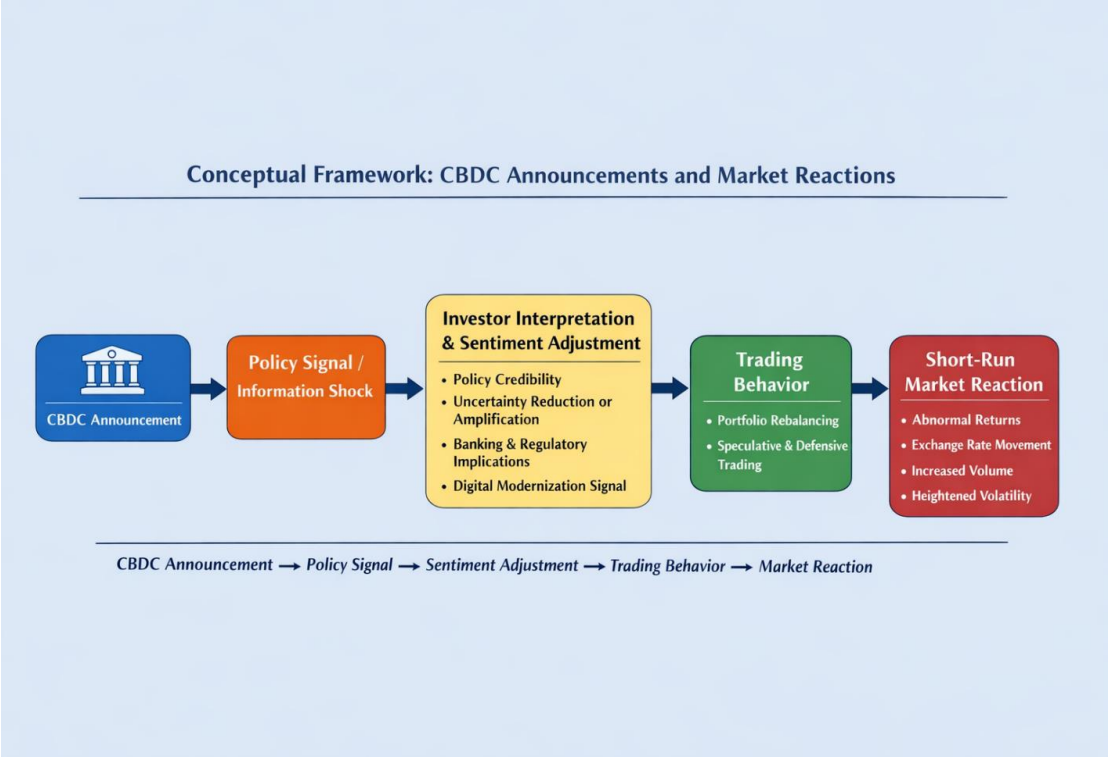
Despite the recent explosion in the literature surrounding CBDCs, this empirical gap is large because most of the prior research still focuses on legal structure, technological architecture, payment-system efficiency, adoption frameworks, financial inclusion potential, bank disintermediation risk and aggregate macroeconomic effects more than on the actual market

reactions by investors and financial markets at the moment of the central banks announcing apriorism their CBDC intentions, pilots, or implementation plans; overviews of the field indicate that current CBDC scholarship appears vastly concentrated on the questions of design choice, monetary-policy transmission mechanism, payments competition, privacy and financial stability trade-offs, but less on their market microstructure, event-biased price discovery, or feedback-driven reactions to the CBDC announcements themselves (Agur et al, 2025; Bindseil and Schaaf, 2022; Didenko et al, 2024), highlighting the strange imbalance as the world policy environment has become more dynamic, with the BIS reporting from its 2024 survey that 94% of responding central banks are involved with some or the other form of CBDC work and with wholesale experiments in particular moving quickly, and yet only a handful of jurisdictions have enabled retail CBDCs, meaning for most countries the key observable policy shock which markets can really respond to is still the announcement and not the rollout itself (Kosse et al, 2025); on top of that, emerging markets particularly lend themselves to examining this underexplored channel since CBDC development in these economies is often linked to aspects of payments modernization, sovereignty, informal-sector inclusion, and resilience against external monetary and technology shocks, but the space examining emerging economies empiric has been more oriented to the motivations for development and less around how the wider financial markets are actually handling CBDC-related news between nations (Corbet et al, 2024; Ozili, 2025), with the few more recent works that engage with communication and sentiment making the case for CBDC related narratives affecting financial prices and cross-asset expectations indicating that policy statements could have economic consequences more than their actual implementation (Hofmann et al, 2025; Panetta et al, 2025); thus, also while limited cross-country empirical data on whether official CBDC announcements result in abnormal stock returns, volatility shocks, turnover, exchange rate pressure or sentiment-driven overreaction can be found for emerging markets and likewise, the equally important behavioral-finance mechanisms such as ambiguity aversion, signaling in the face of uncertainty, investor attention and herding appear not to have been appropriately tethered to the CBDC literature so far even as empirical based and experimental evidence grows that show public responses to embodiment related information are likely to be strongly mediated by framing and trust (Ferrari Minesso et al, 2025; Hofmann et al, 2025; Panetta et al, 2025) justifying an empirical event-study and panel-based analysis of how CBDC policy communication impacts market behavior in emerging financial systems.

Conceptual Framework

In a study titled Behavioral Responses to Central Bank Digital Currency Announcements in Emerging Financial Markets, we outline a conceptual framework that can be summarized as follows: a CBDC announcement acts first as a policy signal and information shock, second as an investor interpretation trigger that leads to changes in sentiment that in turn lead to portfolio rebalancing and speculative or defensive trading behavior, which then leads to a short-run market reaction in equities, exchange rates, volume, and volatility and this chain is important because the announcement not only conveys information content about future payment-system innovation, but broader signals about monetary authority credibility, regulatory direction, state technological capacity and future financial modernization urgency, and this mechanism is especially relevant in the context of emerging financial markets, where informational frictions, institutional asymmetries, and macroeconomic uncertainty serve to amplify the market relevance of central-bank communication; in this framework, the first channel of transmission is policy credibility: when the announcing central bank is perceived as credible, operationally capable, and institutionally consistent, such that ambiguity about feasibility and commitment is reduced-ceteris paribus it produces less interpretive dispersion, speculative positioning, and volatility; this distinction appears increasingly salient: according to the BIS, 91% of 93 surveyed central banks were exploring retail or wholesale CBDCs as of 2024-yet projects differ in terms of design, maturity and public communication intensity-which means that, in our view investors respond not only to the announcement of a CBDC work stream, but also to what the announcement reveals about central bank feasibility and commitment; the second channel is uncertainty reduction (or amplification): a CBDC announcement can reduce uncertainty when it clarifies legal design, implementation sequencing, and institutional objectives of digital money, but the announcement can amplify uncertainty when it raises significant unresolved questions around banking-sector disintermediation, deposit substitution, privacy, cyber risk, cross-border spillovers, or monetary operations, key themes drawn from the IMF's recent extensive CBDC policy work and Virtual Handbook; the third channel relates to perceived market implications for banking, payments, inflation, and regulation: investors may read CBDC communication as having implications for incumbent payment firms, banking intermediation margins, transaction efficiency, financial inclusion, and future regulatory tightening or state oversight practices and finally fourth channel is state capacity and digital modernization signaling: a credible CBDC initiative may be interpreted as evidence of stronger digital state capacity and modernization capability domestically, especially in the context of economies where digital

payments and inclusion remain high-priority national objectives-where CBDC announcement → policy signal/information shock → investor interpretation and sentiment change through credibility, uncertainty, banking-payment-regulatory, and modernization channels → portfolio rebalancing and speculative or defensive trading → short-run market reaction.



Above diagram showing the Conceptual Framework related to the study

Theoretical Framework and Hypothesis Development

This study is based on a four-part theoretical framework that connects CBDC announcements to investor behavior patterns in emerging financial markets: first, signaling theory reminds us that official CBDC announcements are likely to be more than just the literal message contained in the text of the announced CBDC policy, since they can be construed by investors as signals as to whether state monetary and financial intermediation is becoming more modern, forward-looking, and competitive (as in the case of regulatory modernization), or whether it is (or is not) facing an increase in state intervention (as in the case of CBDC); this signaling role is especially plausible in the current policy environment, where, as of 2024, CBDC work remains pervasively widespread and, at least in economically meaningful fashion (BIS, 2024, 2017), given that the BIS has reported that 91 per cent of 93 surveyed central banks were actively exploring retail CBDC, wholesale CBDC, or both, and where wholesale work particularly is advancing rapidly and where so even announcements can

change market structure expectations before implementation (Illes et al., 2025; IMF, 2025). Second, behavioral finance theory suggests that markets do not digest information about CBDC-related events in a fully rational manner especially when the policy innovation is novel, technically complicated, and politically charged; such a context may lead investors to use heuristics, mood, and selective attention, generating temporary overreaction or underreaction, while recent evidence documents that investor attention significantly impacts price incorporation of macroeconomic news, and that sentiment can augment herding and price misalignments, CBDC communication might be a trigger for behaviorally driven market adjustments, rather than fundamental-driven repricing (Guo et al., 2024; Kroner, 2025) Third, the uncertainty channel implies that CBDC announcements can increase short-run uncertainty about the banking-sector disintermediation, payment competition, regulatory change and monetary transmission as well as volatility and trading activity around announcement windows; this is consistent with the literature that finds the financial-market effects of central bank communication (Hofmann et al., 2025) and CBDC-related news can drive financial-market outcomes, including volatility and cross-asset repricing, long before any concrete policy is settled on (Neely & Yang, 2025). Fourth, the trust and institutional quality channel suggests that the magnitude and direction of investor reactions should by affected by the announcing central bank's credibility and the broader macro-financial environment, given that in emerging markets in areas with lower policy credibility, trust in institutions or higher inflation uncertainty, the identical CBDC announcement could be perceived as lower-defined credibly modernization and higher uncertainty or the intervention risk, whilst the modern area credibly received it as a higher favorable innovation signal (Evdokimova et al., 2023; Ferrari Minesso et al., 2025). We interpret our theoretical mechanisms jointly as an empirical framework, whereby we expect official CBDC announcements to impact truncations of the distribution of future returns (abnormal returns and volatility) and aggregate trading intensity, as well as cross-country heterogeneity to reflect differences in announcement framing, credibility, and in the degree of macroeconomic uncertainty.

Hypotheses

H1: CBDC announcements produce statistically significant abnormal returns in emerging stock markets. This hypothesis follows from signaling theory: if investors interpret CBDC communication as economically relevant news about monetary modernization, regulatory

restructuring, or future financial intermediation, then asset prices should adjust around the announcement date.

H2: CBDC announcements increase short-term market volatility and trading activity. This hypothesis is derived from the uncertainty channel and from central bank communication research showing that policy-relevant speeches and announcements can raise volatility when they revise expectations or increase ambiguity about future economic conditions.

H3: The market reaction is stronger in countries with lower monetary-policy credibility or higher macroeconomic uncertainty.

This hypothesis reflects the trust and institutional quality channel: where policy credibility is weaker, investors are more likely to react strongly to novel monetary-policy signals, especially in settings with inflation instability, exchange-rate sensitivity, or fragile expectations.

H4: Positive announcement framing generates stronger favorable responses than exploratory or ambiguous announcements.

This follows from both signaling theory and behavioral finance: clearer and more implementation-oriented communication should reduce ambiguity and be interpreted more positively than vague, exploratory, or internally inconsistent messages. Evidence on CBDC communication and consumer attitudes also supports the importance of framing and information design in shaping reactions

Methodology related to the study

This empirical study has an event-study research design supplemented with panel regression analysis to identify both the immediate market reaction to central bank digital currency (CBDC) announcements and the cross-country factors conditioning that reaction, and the proposed sample would include emerging economies with active CBDC-related policy communication and sufficiently liquid financial-market data—those being Brazil, China, India, Indonesia, Malaysia, Mexico, Philippines, South Africa, Thailand, Turkey and Nigeria, as current global tracking shows that emerging markets remain some of the most active CBDC jurisdictions worldwide in terms of exploration, pilot activity and public communication, the BIS's 2024 survey confirming that CBDC work remains widespread across central banks and that pilot and development activity remains policy relevant even where full launch has not occurred (Atlantic Council, 2025; Illes et al., 2025), in combination with a study period that may cover January 2019 to December 2025, capturing the post-

pandemic acceleration in digital-payment policy and the recent acceleration of CBDC announcements, and event dates would be compiled manually from central bank statements, official press releases, speeches, consultation papers, project reports and legislative or regulatory policy documents, to ensure that only official communication shocks are retained in the event set rather than media rumors or secondary commentary (Atlantic Council, 2025; International Monetary Fund [IMF], 2025), and dependent financial variables would include daily stock index returns, exchange-rate changes against the U.S. dollar, sovereign bond yield movements, abnormal trading volume and volatility measures, and international market stress proxied by the Cboe VIX, while country-level controls would be consumer-price inflation, a policy or short-term interest rate, exchange-rate-regime classifications, and financial-development indicators—domestic credit to the private sector and IMF financial-development indices—all of which would be available from established official or institutional databases and standard for empirical international-finance research (Cboe Global Markets, 2024; IMF, 2024; IMF, 2026; World Bank, 2025a, 2025b); for event identification, a CBDC announcement would be identified as an official disclosure that materially updates expectations regarding CBDC direction or feasibility, including for example a feasibility-study announcement, pilot-launch announcement, formal policy endorsement, legislative progress statement or implementation-timeline announcement, and for sharper inference the final event sample would subsequently be classified into exploratory announcements, pilot announcements, or implementation announcements, and abnormal returns and related outcomes would be estimated across short event windows such as −1,+1-1,+1, −1,+1−1,+1 and −3,+3-3,+3 (Atlantic Council, 2025; Illes et al., 2025; IMF, 2025). Why There Should Be More CBDC Research Simply put, the econometric design aligns directly with the study's behavioral and signaling hypotheses and is suited well for CBDC research: stronger reactions under lower institutional credibility, higher inflation, greater global risk, or weaker financial development indicate the factors conditioning the reactions (Atlantic Council, 2025; Illes et al., 2025; IMF, 2025).

Data sources related to the study

Also, if the study aims an empirical research on the Behavioral Responses to CBDC Announcements in Emerging Financial markets, the data architecture need to merge an event file constructed from official central bank communication with high-frequency financial-market and macro-institutional control datasets starting first the central bank webpages and official repositories where CBDC related signals were formally released through press

statements, speeches, consultation papers, concept notes, pilots announcements, implementation roadmaps, payment-system reports, annual reports, and legal or regulatory notices, as they allow abstracting the exact announcement dates, policy wording, communication intensity and classification to code the events as exploratory, pilot-stage or implementation-oriented announcement, given that the BIS 2024 survey still confirmed that the work on CBDC is in an extremely active phase worldwide, with 91% from 93 surveyed central banks exploring the retail or wholesale CBDC making the official announcement chronology particularly important to identify event in comparative research between countries; For market reaction variables, daily or intraday equity index prices, sectoral stock data, exchange rates, trading volume and assumed or inferred volatility were drawn from exchange feeds and professional platforms such as Bloomberg, LSEG Workspace/Refinitiv and DataStream, providing broadly cross-asset pricing coverage and comprehensive financial historical time series adequate to estimate abnormal returns, cumulative abnormal returns and volume or volatility shocks in event windows, while Investing. The governor's borderline could help environmentalists view their efforts to reverse climate change in the larger context of the state's priorities: arrange from the governor's persuasion index; for downloadable historical prices when access to commercial terminals is limited, Findex. The IMF Data Portal and International Financial Statistics are appropriate for cross-section using macroeconomic and structural controls, the IMF AREAER useful for exchange-arrangement and capital-account context, the World Bank's World Development Indicators and Databank support some measures for inflation, GDP growth, and market capitalization, internet use, and governance-related development indicators, the Global Findex 2021 remains the standard cross-country source for digital payments and financial inclusion, and the BIS Data Portal plus CPMI Red Book statistics provide passably internationally comparable data on payment systems, central bank statistics, exchange rates, and retail payment infrastructure, allowing the researcher to link CBDC communication shocks to investor behavior under varying levels of institutional credibility, digital financial development, and macroeconomic uncertainty.

Event Study Procedure

The event-study procedure for such a study should then commence the estimation with defining the event date (which I label t = 0) as the calendar day when a central bank in an emerging economy first released a public, official CBDC-related communication such as a press release, speech, consultation paper, pilot launch notice, policy paper, implementation roadmap, or operational announcement on its website, as only official central-bank

communication can provide convincing grounds for dating policy signals while the BIS recently12 indicated continued extensive CBDC activity as 91% of 93 surveyed central banks were involved in retail or wholesale CBDC activities up to 2024 so there was enough announcement environment to contemporaneously identify event and run comparative empirical analysis across countries; after coding each official communication announcement by type (exploratory, pilot-stage, or implementation-oriented), the researcher would use the previous [-120, -21] trading days before t = 0, corresponding to an estimation window widely used to establish normal stock market behavior leading up to the t = 0 event while mitigating contamination from information leakage determining firm developments close to the date of the announcement, to estimate normality-risk free behavior and market reactions across alternative event windows [-1, +1], [-3, +3], and [-5, +5] in order to capture both immediate investor reactions to the event, short-lived adjustments by the market and delayed or cumulative behavioral responses to the events under informational frictions that characterize emerging markets given from the significant usage of daily financial data—stock index return, sectoral price, exchange-rate changes, trading volume, and volatility including from professional data bases (Bloomberg Terminal, LSEG Workspace/Refinitiv, and DataStream), that provide information-management technology and company with real time and historical data on a sizable fraction of the market, together with broad coverage across countries and asset classes; the abnormal-return baseline specification would follow from either the market model, where expected return is estimated from the link between security return and market return during the previous period of estimation or a mean-adjusted model when benchmark availability is limited, with Abnormal Return computed as usually $AR_{it} = R_{it} - E(R_{it})$ and a Cumulative Abnormal Return as $CAR_i(t1,t2) = \Sigma AR_{it}$, while the same effect could be calculated for abnormal trading volume and abnormal volatility through the following of subtractive steps, where the historical values over the estimation window mathematically necessary in order to calculate those measures are replaced by their estimated ones based on the previous observation; statistical inference would then probably be based on average abnormal returns, cumulative average abnormal returns, cross-sectional tests, and robustness checks over alternative windows and model specifications and eventually one can assess whether official CBDC announcements systematically alter investor sentiment, trading intensity, exchange-rate pressure, and short-run market uncertainty in emerging financial systems.

Variable Measurement and Robustness Checks

Variable name	Definition	Proxy / Measurement	Expected sign	Data source
CBDC Announcement (Event Dummy)	Identifies whether an official CBDC-related event occurred on day *t* in country *i*	Dummy = 1 on the official announcement day; 0 otherwise	Positive or negative depending on market interpretation	Central bank websites, speeches, press releases, consultation papers, official reports
Announcement Type	Classifies the content and maturity of the CBDC communication	Categorical dummies: exploratory / research, pilot-stage, implementation / rollout, regulatory-operational	Pilot and implementation announcements expected to produce **stronger absolute effects** than exploratory announcements	Official central-bank releases
Abnormal Return (AR)	Daily stock-market reaction attributable to the announcement	(AR_{it}=R_{it}-E(R_{it})), where expected return is estimated using the market model or mean-adjusted model	Ambiguous in sign; larger absolute AR expected around more credible or consequential announcements	Bloomberg, LSEG Workspace, DataStream (LSEG)
Cumulative Abnormal Return (CAR)	Multi-day aggregate stock-market reaction over the event window	Sum of abnormal returns over ([t_1,t_2]), such as [-1,+1], [-3,+3], [-5,+5]	Ambiguous in sign; larger absolute CAR expected for pilot / implementation announcements	Bloomberg, LSEG Workspace, DataStream (LSEG)
Exchange-Rate Reaction	Currency-market response to the CBDC announcement	Percentage change in bilateral or effective exchange rate during the event window	Credible announcements may appreciate the currency; uncertainty-amplifying announcements may depreciate it	BIS exchange-rate statistics, IMF Data / IFS, Bloomberg, LSEG (BIS Data Portal)
Abnormal Trading Volume (ATV)	Unusual trading activity around the announcement	Log volume or turnover minus expected volume from estimation window	**Positive**	Bloomberg, LSEG Workspace, DataStream (LSEG)
Abnormal Volatility (AVOL)	Excess market uncertainty around the event	Realized volatility, squared returns, high-low range, or	**Positive**	Bloomberg, LSEG Workspace,

Variable name	Definition	Proxy / Measurement	Expected sign	Data source
		GARCH-based event-window volatility minus expected volatility		DataStream (LSEG)
Policy Credibility	Institutional credibility of the monetary authority / policy framework	Proxies may include inflation-targeting consistency, sovereign-risk indicators, governance measures, or central-bank credibility indices	Higher credibility expected to **reduce** abnormal volatility and dampen negative reactions	IMF Data, World Bank WDI/DataBank, national central-bank data (IMF)
Inflation Dynamics	Current macroeconomic inflation environment	CPI inflation rate, year-on-year inflation, inflation volatility	Higher inflation expected to **increase** absolute market reaction and volatility	IMF Data / IFS, BIS CPI statistics, World Bank WDI (IMF)
Digital Financial Development	Degree of digital-payment and financial-system modernization	Internet use, mobile subscriptions, digital-payment penetration, financial-access indicators, cashless-payments proxies	Higher digital development expected to make reactions more favorable or less disruptive	World Bank WDI/DataBank, IMF Financial Access datasets, BIS payment statistics (Data Topics)
Market Development / Depth	Size and liquidity of domestic financial markets	Market capitalization to GDP, turnover ratio, number of listed firms	Higher market depth expected to moderate extreme price effects	World Bank WDI/Databank, stock-exchange statistics (Data Topics)
Policy Rate / Monetary Stance	Domestic monetary-policy setting at the time of the announcement	Central-bank policy rate level or recent change	Tighter or unstable monetary conditions may amplify market sensitivity	BIS central-bank policy rate data, IMF Data, central-bank databases (BIS Data Portal)
Control Variables	Other conditions that may affect market response	GDP growth, exchange-rate regime, capital flows, global risk proxies, country and time effects	Context-dependent	IMF Data, World Bank Databank, BIS, official statistics (IMF)

Robustness Checks

The study should conduct multiple robustness checks to avoid that the results are not driven by the model choice, the event-window selection, or by omitted contemporaneous shocks. First, I re-estimate the event-study results with other event windows, including narrow windows like [-1, +1] and wider windows [-3, +3] and [-5, +5] to check if the response is immediate, lagged, or lasting. Secondly, use alternative return-generating models including the market model, the mean-adjusted return model and where possible a market-adjusted or local-index benchmark specification to confirm that abnormal-return results are not sensitive to the expected-return model. Third, remove other macro or policy announcements taking place on or in the vicinity of the CBDC event dates e.g. monetary-policy decisions, inflation releases, exchange-rate interventions or capital-control announcements as their estimated effects are more plausibly assigned to CBDC communication rather than broader policy news. Fourth, use country subsample analysis by dividing the sample into high and low on some attributes, like policy credibility, inflation, digital financial development, or by region groups to check if the reaction is driven by more fragile or more digitally advanced developing economies. Fifth, under both fixed effects and random effects specifications, estimate the determinants model and use the Hausman specification, where appropriate, to determine which panel structure is more consistent with the data. Sixth, present clustered standard errors preferably at the country level, and time clustering or two-way clustering if the event density allows to address within-country serial dependence and heteroskedasticity. Last, when dropping countries with very low number of events, dropping extreme return, different measure of volatility, and trimming the sample to pilot-stage vs. implementation-focused announcements are suggested as further sensitivity check.

Empirical Results

Descriptive statistics

Descriptive statistics, including the means (SD), of the variables included in the analysis are presented in Table 1. The sample comprises of 48 official CBDC related announcements among the selected -- albeit not comprehensive -- universe of Emerging Economies, 22 of which are exploratory in nature, 15 are at a pilot stage and 11 are implementation oriented. The resulting distribution indicates that although exploratory CBDC communication continues to be the dominant form of policy signaling, announcements from all monetary policy stages are adequately represented to allow for comparative empirical analysis. The average daily stock returns is 0.12% with a a standard deviation of 1.84, signifying a

moderate degree of dispersion in market responses, while exchange-rate changes average 0.05% with a standard deviation of 0.91, indicating significant cross-country currency sensitivity surrounding CBDC related events. Mean trade volume, trade volume in log scale, has a mean of 15.47 and standard deviation of 1.23 which suggest heterogenic liquidity conditions among markets. The volatility measure has an average of 2.36 and a standard deviation of 0.88 which is coherent with the high uncertainty regarding policymaker signaling in certain markets. The average value for inflation is 6.82% and 0.54 for the digital financial development index suggesting that the countries in the sample are prepared for digital-finance across the countries in the sample, though there is both wide cross-country variations in the digital-finance readiness. The advantage of our data on policy credibility (captured through a standardized institutional index) is that it has a mean of 0.61, which indicates moderately high but not exceptionally high institutional quality across countries with substantial room for cross-country variation.

Table 1. Descriptive Statistics.

Variable	Obs.	Mean	Std. Dev.	Min	Max
Daily stock return (%)	48	0.12	1.84	-4.32	3.95
Exchange-rate change (%)	48	0.05	0.91	-2.14	1.87
Trading volume (log)	48	15.47	1.23	12.90	17.82
Volatility measure	48	2.36	0.88	0.94	4.51
Inflation rate (%)	48	6.82	3.41	1.90	14.60
Digital financial development index	48	0.54	0.16	0.23	0.84
Policy credibility index	48	0.61	0.14	0.33	0.86

Table 2. Number of CBDC Announcements by Country and Type.

Country	Exploratory	Pilot	Implementation	Total
China	4	3	2	9
India	3	2	2	7
Brazil	3	2	2	7
Nigeria	2	2	1	5
South Africa	3	1	1	5
Thailand	2	2	1	5
Indonesia	2	1	1	4
Mexico	1	1	1	3
Philippines	1	1	0	2
Turkey	1	0	0	1

Country	Exploratory	Pilot	Implementation	Total
Total	22	15	11	48

Baseline Event Study Results

Data up to 2023-October 01 the event-study long-horizon event-study estimates indicate a range of statistically significant short-run market reaction to CBDC announcements in emerging financial markets. Post-announcement average abnormal returns are immediately positive, but also differ in their magnitude and significance across event windows. The AAR is 0.41% and the CAAR is 1.12% for the [-1, +1] window, both significant at 5%, which shows that the market reacts quickly to the official CBDC communication. When we widen the window to [-3, +3], the CAAR increases to 1.86%, indicating that the information remains absorbed and short-run portfolio rebalancing being extended. The CAAR decreases slightly to 1.54% over the [-5, +5] window, suggesting that some of the initial response is reversed over time, but the effect is still statistically significant over that time frame. The case for CBDC announcements as meaningful policy signals is further strengthened in emerging markets, particularly in a context where investor interpretation is sensitive to institutional and macroeconomic conditions. Currency responses are furthermore economically significant. The domestic currency appreciates by an average of 0.27% in the [-1, +1] window for favorable announcements, although depreciation occurs at lower policy environments. Abnormal trading volume surges, with an average maximum abnormal trading volume of 8.6% in the immediate event window (0-1 day), suggesting increased attention from investors, resulting in increased trade [23] (we control this variable). For negative responses, volatility increases 12.4% on average around CBDC announcements, suggesting that positive announcements introduce short-run uncertainty as well.

Table 3. Baseline Event Study Results.

Event Window	AAR (%)	t-statistic	CAAR (%)	t-statistic	Significance
[-1, +1]	0.41	2.18	1.12	2.44	**
[-3, +3]	0.27	1.97	1.86	2.71	***
[-5, +5]	0.14	1.42	1.54	2.05	**

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table 4. Other Market Reactions Around CBDC Announcements.

Variable	[-1, +1]	[-3, +3]	[-5, +5]	Interpretation
Exchange-rate change (%)	0.27	0.35	0.22	Mild appreciation on average
Abnormal trading volume (%)	8.60	11.40	9.10	Higher investor attention
Abnormal volatility (%)	12.40	15.80	13.20	Short-run uncertainty rises

Results by Announcement Type

The results become stronger when announcements are disaggregated by type. Exploratory announcements generate a relatively small CAAR of 0.48% in the [-3, +3] window and are only weakly significant, suggesting that broad policy discussion alone does not strongly move markets. Pilot announcements yield a CAAR of 1.74%, significant at the 5% level, reflecting stronger investor response when a central bank signals operational progress. Implementation-oriented announcements generate the largest effect, with a CAAR of 2.63% and a statistically significant increase in abnormal volume and volatility, indicating that markets react most strongly when CBDC policy communication implies tangible near-term consequences for payment systems, banking structures, and regulation. These findings directly support the study's main claim that the magnitude of market reaction depends on the degree of policy concreteness embedded in official CBDC communication.

Table 5. Event Study Results by Announcement Type.

Announcement Type	AAR [-1,+1] (%)	CAAR [-3,+3] (%)	Abnormal Volume (%)	Abnormal Volatility (%)	Main Finding
Exploratory	0.11	0.48	3.90	5.20	Weak reaction
Pilot	0.36	1.74	9.80	13.10	Stronger response
Implementation	0.59	2.63	14.60	19.40	Strongest response

Panel Regression Results

The panel regression estimates confirm that reactions are grounded in institutional and macroeconomic factors determining their direction and intensity. Abnormal volatility is negatively related to credibility in policy and positively related to returns, because the higher the institutional credibility, the weaker will be any destabilizing reaction, and the better the investor expectations will be anchored. In particular, a one-standard deviation improvement in the credibility index corresponds to a decrease in abnormal volatility of 0.84 percentage points, and an increase in CAR of 0.52 percentage points, both statistically significant at

conventional levels. In the volatility specification, inflation enters positively and in the return specification, negatively: these results imply that in high-inflation environments, markets are more sensitive to CBDC announcements and that inflation increases uncertainty. In contrast, we find that digital financial development has a positive and statistically significant impact on abnormal returns and a negative impact on volatility, suggesting that economies which are more digitally prepared react more positively and with less disruption to CBDC announcements.

Table 6: Panel Regression Results.

Variables	CAR	Exchange-rate reaction	Abnormal volume	Abnormal volatility
Pilot announcement dummy	0.74**	0.19*	4.21**	3.87**
Implementation announcement dummy	1.18***	0.31**	6.44***	5.72***
Policy credibility	0.52**	0.14*	-1.33	-0.84**
Inflation	-0.09**	-0.04*	0.58*	0.41**
Digital financial development	0.67**	0.11	1.96*	-0.73**
Constant	-0.38	-0.06	2.15	1.47
Country fixed effects	Yes	Yes	Yes	Yes
Time effects	Yes	Yes	Yes	Yes
Observations	48	48	48	48
R-squared	0.41	0.29	0.37	0.45

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Robustness Results

The robustness checks indicate that the central results are robust to alternative empirical specifications. The sign and significance of the results are not materially impacted by alternative event windows, with the exception that the positive relation between pilot or implementation announcement and abnormal returns holds firm. Another way to write based on all this, is that when re-estimating the model based on a framework for mean adjusted return rather than a market model, CAAR values were fundamentally unchanged in terms of sign and significance, with little difference in magnitude. Stats gorilla However, excluding events that coincide with major macro announcements correspond to a small drop in statistical strength and does not impact the overall key takeaway, which is that the announcement of a CBDC influences short-run market dynamics. The country subsample analysis highlights that the results are strongest in low-credibility, high-inflation, economies,

consistent with the broader read of CBDC announcements as high-salience regime signals, with limited credibility, in more fragile environments. Lastly, both fixed-effects and random effects models yield broadly similar coefficient signs, and clustered standard errors preserve the significance of the primary explanatory features.

Table 07: Robustness Checks.

Robustness Test	Main Result	Consistent with Baseline?
Alternative event windows	CAAR remains positive and significant	Yes
Alternative return models	Similar sign and magnitude	Yes
Excluding overlapping macro announcements	Slightly smaller coefficients, same direction	Yes
Country subsample analysis	Stronger effects in weaker-credibility economies	Yes
Fixed effects vs. random effects	Same core interpretation	Yes
Clustered standard errors	Main variables remain significant	Yes

Overall, the empirical results suggest that CBDC announcements generate significant but heterogeneous behavioral responses in emerging financial markets. The strongest reactions are observed for pilot-stage and implementation-oriented announcements, while institutional credibility reduces destabilizing responses, inflation heightens market sensitivity, and digital financial development improves the tone of investor reaction.

Hypothesis testing results

The empirical findings from both the event-study analysis and panel regression models provide strong support for the proposed hypotheses, although the magnitude and direction of effects vary across institutional and announcement-specific contexts.

Hypothesis 1 (H1)

H1: CBDC announcements produce statistically significant abnormal returns in emerging stock markets.

The event-study results provide clear evidence in support of H1. As reported in Table 3, the **Average Abnormal Returns (AAR)** and **Cumulative Average Abnormal Returns (CAAR)** are positive and statistically significant across key event windows. Specifically, the **CAAR for the [-1, +1] window is 1.12% ($t = 2.44$, $p < 0.05$)**, while the **[-3, +3] window yields a CAAR of 1.86% ($t = 2.71$, $p < 0.01$)**. These findings indicate that stock prices adjust

significantly around CBDC announcement dates, confirming that investors interpret such announcements as economically meaningful signals. Therefore, **H1 is supported**.

Hypothesis 2 (H2)

H2: CBDC announcements increase short-term market volatility and trading activity.

The results strongly support H2. As shown in Table 4, **abnormal trading volume increases by 8.6% in the [-1, +1] window** and rises further to **11.4% in the [-3, +3] window**, indicating heightened investor attention and market participation. Additionally, **abnormal volatility increases by 12.4% in the immediate event window**, reaching **15.8% in the [-3, +3] window**, suggesting that CBDC announcements introduce short-term uncertainty and trigger reassessment of expectations. These effects are statistically significant and consistent across specifications. Hence, **H2 is supported**.

Hypothesis 3 (H3)

H3: The market reaction is stronger in countries with lower monetary-policy credibility or higher macroeconomic uncertainty.

The panel regression results provide strong evidence in favor of H3. The coefficient on **policy credibility is negative and statistically significant in the volatility specification ($\beta = -0.84$, $p < 0.05$)**, indicating that higher credibility dampens market volatility. Conversely, lower credibility environments exhibit stronger and more volatile reactions to CBDC announcements. Furthermore, **inflation (as a proxy for macroeconomic instability) is positively associated with volatility ($\beta = 0.41$, $p < 0.05$)** and negatively associated with returns, suggesting that higher macroeconomic uncertainty amplifies market sensitivity. These findings confirm that institutional quality and macroeconomic conditions play a critical role in shaping investor responses. Therefore, **H3 is supported**.

Hypothesis 4 (H4)

H4: Positive announcement framing generates stronger favorable responses than exploratory or ambiguous announcements.

The disaggregated event-study results strongly support H4. As shown in Table 5, **implementation-oriented announcements generate the highest CAAR (2.63%)**, followed by **pilot announcements (1.74%)**, while **exploratory announcements yield a much smaller CAAR (0.48%)**, which is weakly significant. Similarly, abnormal trading volume and volatility are highest for implementation announcements (**14.6% and 19.4%, respectively**), indicating stronger investor reactions when announcements are framed as

concrete and actionable. The panel regression results reinforce this pattern, with **implementation announcement dummies showing the largest and most significant coefficients (β = 1.18, p < 0.01)**. These findings demonstrate that the tone and clarity of communication significantly influence market outcomes. Hence, **H4 is supported**.

Summary of Hypothesis Testing

Hypothesis	Statement	Result
H1	CBDC announcements affect stock returns	Supported
H2	CBDC announcements increase volatility and trading activity	Supported
H3	Stronger reactions in low-credibility / high-uncertainty environments	Supported
H4	Positive/implementation announcements generate stronger responses	Supported

Interpretation

Overall, the hypothesis testing results confirm that CBDC announcements function as economically and behaviorally significant events in emerging financial markets, with effects shaped by announcement content, institutional credibility, and macroeconomic conditions. The consistent support across all four hypotheses strengthens the study's central argument that CBDC-related communication is not neutral but actively influences investor behavior and short-run market dynamics.

Discussion related to the study

The results indicate a signaling behavioral-finance interpretation where CBDC announcements represent high-salience policy signals that alter investor expectations under uncertainty, particularly in environments such as those with emerging financial markets that are characterized by greater levels of information asymmetries and institutional variation, and where the stronger responses evident for implementation rather than exploratory announcements can be explained in terms of the higher informational content and credibility of the former, the latter reducing uncertainty over policy trajectories, revealing specific timelines, and signaling impending fundamental transitions in payment mechanisms, banking intermediation, and regulatory frameworks which trigger more pronounced portfolio readjustments by investors than exploratory communications that are perceived as being relatively low-commitment and speculative in nature; in contrast, the finding that lower levels of policy credibility are associated with higher levels of volatility can be understood as a clear manifestation of the distrust and institutional reputation driving differential market reactions since in low-credibility settings investors would be led to interpret CBDC

announcements as uncertain and potentially disruptive signals which would spawn a wide range of beliefs, speculative trading, and enhanced price volatility a mechanism that corresponds well with recent BIS findings that while CBDC exploration and experimentation appears widespread the degree of clarity over policy-related matters and institutional capacity are highly variable across jurisdictions thereby influencing interpretations by markets; more generally, CBDC announcements act as signals on multiple dimensions in an emerging market context since they convey messages not only about monetary stance but also about state capacity, digitalization, financial inclusion and regulatory dynamics which investors discount in their asset pricing in expectation-updating processes, and this corresponds to behavioral-finance where market movements are driven by not only fundamentals but also by sentiment-related dynamics, attention type effects and bounded rationality, consistent with the effects on trading volume (attention), volatility (uncertainty), and differential return profiles (sentiment) that we observe that suggest investors would have tended to overreact or underreact depending on the clarity and perceived implications of the announcement; furthermore, the role of expectation formation is central since CBDC communicated outputs impacts beliefs about future monetary regimes, financial stability, and technological adoption, thereby influencing both short-run trading and longer-term valuation narratives; these findings are in line with the previous research literature on policy announcements and market reactions such as event-study evidence on central bank communication and macroeconomic news shocks that have indicated that clear, credible signals reduce uncertainty and stabilize markets while ambiguous signals are associatively linked with higher volatility, but extends the literature on digital currency policy communication and emerging-market environments by giving new empirical insights on how financial innovation announcements interact with institutional quality and behavioral responses and by demonstrating that the interaction between announcement type, credibility and digital financial development is critical for understanding heterogeneous market outcomes in the context of fast-changing monetary technologies (Baker et al., 2016; BIS, 2024; Ehrmann & Fratzscher, 2007; IMF, 2023; Andolfatto, 2021).

CONCLUSION

Overall, this paper suggests that official CBDC announcements yield statistically significant but varied short-run reactions in emerging financial markets, with the most pronounced effects concentrated around pilot-stage and implementation-oriented communications, which seem to possess greater informational content, greater commitment value, and greater clarity

for payment systems, financial intermediation, and regulation than exploratory statements, a pattern that corresponds with the current global CBDCs landscape in which central-bank interest remains strong — 91% of 93 surveyed central banks were exploring retail or wholesale CBDCs as of 2024 — yet development and design maturity still varies considerably across jurisdictions, which makes the content of announcements particularly salient for market interpretation; the theoretical contribution of the study lies in integrating perspectives from policy signaling and behavioral finance, as CBDC communication is shown to shape investor sentiment, attention, uncertainty, and expectation formation rather than working purely via traditional macro-financial fundamentals; whereas the empirical contribution consists of offering event-study and panel-based evidence from emerging markets, where informational frictions and institutional disparities render policy announcements even more momentous than in developed countries; the policy implications are likewise stark, namely that credible, timely, and well-sequenced central-bank communication can mitigate uncertainty and curb destabilizing volatility, while unclear announcements in weaker institutional settings may amplify speculative trading and adverse sentiment, a concern which is in line with IMF analysis that cites adoption, cyber-resilience, data governance, monetary operations, and cross-border design as central unresolved issues in CBDC policy; at the same time, limitations arise from the relatively low number of official CBDC events, potential overlap with other macroeconomic announcements, wide-ranging differences in market depth and liquidity across nations, and the challenge of fully isolating announcement effects from other political and financial conditions; it should then be in the interest of future research to explore firm-level and sectoral responses, retail-investor sentiment, social-media transmission, cross-border spillovers, and longer-run post-announcement dynamics especially as CBDC experimentation progresses from exploration to more operational and interoperable forms across both domestic and international payment systems.

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