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DIGITAL FINANCE UNDER GLOBAL SHOCKS: CRYPTOCURRENCY DEMAND IN TIMES OF CRISES AND SANCTIONS

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ABSTRACT

This study examines how global shocks reshape cryptocurrency demand, with particular attention to the role of digital finance as an adaptive mechanism under conditions of crisis and financial restriction. Using daily data for Bitcoin and Ethereum from 2018 to 2024, we develop a unified empirical framework that combines matched event-study analysis with dynamic demand modeling to distinguish between immediate market reactions and more persistent adjustment dynamics. The results show that financial crises generate stronger short-run increases in trading volume, turnover, and volatility than sanctions, indicating pronounced speculative responses to market-wide uncertainty. However, these effects fade quickly as information is absorbed. By contrast, sanctions targeting financial infrastructure produce weaker immediate reactions but are associated with more gradual and persistent changes in market conditions, especially through volatility dynamics. Once demand persistence is taken into account, both crisis and sanction shocks have limited direct effects on short-run trading activity, although cryptocurrency demand remains strongly path-dependent over time. Overall, the findings suggest that digital assets serve different functions under different types of global disruption: during crises, they primarily reflect short-lived speculative behavior, whereas under sanctions they increasingly operate as part of a broader process of digital financial adaptation. The study contributes to current debates on digital transformation and financial resilience in the new global economy by showing how cryptocurrencies respond to disruptions in traditional financial market.

Keywords: Cryptocurrency demand, financial crises, economic sanctions.

1. INTRODUCTION

Economic sanctions and financial crises have become central features of the contemporary global financial environment and, increasingly, of the new global economy shaped by digital transformation and resilience under disruption. In recent years, sanctions imposed on countries such as Russia, Iran, and Venezuela have increasingly shifted from trade-related measures toward direct restrictions on financial infrastructure, including payment systems, correspondent banking, access to foreign reserves, and cross-border settlement mechanisms. At the same time, the global economy has experienced repeated episodes of financial stress, ranging from the COVID-19 pandemic to banking-sector disruptions and sharp market-wide corrections. Although both types of shocks undermine confidence in traditional financial systems, they operate through fundamentally different economic channels.

In this context, these disruptions have also accelerated interest in digital financial alternatives as adaptive mechanisms in times of uncertainty.

Alongside these developments, cryptocurrencies have emerged as an alternative financial ecosystem and as part of the broader process of digital transformation in global finance. While initially viewed primarily as speculative assets, cryptocurrencies have increasingly been used for trading, liquidity provision, and cross-border value transfer. This evolution has raised an important question: whether cryptocurrency demand under stress reflects short-term speculative behavior or more persistent, transaction-driven usage. Periods of financial crises and sanctions are often associated with surges in cryptocurrency trading activity, heightened volatility, and increased usage of digital assets. However, the underlying economic mechanisms driving these patterns remain insufficiently understood.

The existing literature provides extensive but fragmented evidence. A large body of research examines cryptocurrency behavior during financial crises, focusing on returns, volatility, and correlations with traditional assets [1]–[4]. These studies generally find that cryptocurrencies exhibit heightened volatility and stronger co-movement with equity markets during periods of stress, suggesting that crypto demand is largely driven by speculative and risk-related factors rather than safe-haven motives. More recent work also documents that geopolitical and macroeconomic uncertainty is associated with increases in crypto trading activity and volatility [5]–[8]. At the same time, this strand of research also points to the growing relevance of digital assets in understanding how financial markets respond to global shocks.

In parallel, a growing strand of research examines cryptocurrency usage in the context of economic sanctions. This literature argues that sanctions restricting access to the international financial system increase incentives to use cryptocurrencies for cross-border transactions and capital mobility [9]–[11]. Empirical evidence shows that cryptocurrency activity tends to increase in sanctioned jurisdictions and around sanction-related events. However, most studies rely on aggregate measures such as geopolitical risk indices or country-level exposure and rarely distinguish between different types of sanctions. In particular, limited attention has been paid to sanctions that directly target financial infrastructure, which are more likely to affect transactional behavior and reveal how digital finance may support adaptation when conventional systems are constrained.

Despite the rapid expansion of these two strands of literature, an important gap remains. Existing studies typically analyze either financial crises or sanctions in isolation and do not provide a systematic comparison of their relative effects on cryptocurrency demand. As a result, it is unclear whether crypto activity observed during sanctions reflects a distinct, transaction-driven response to financial constraints or simply mirrors the speculative dynamics commonly observed during crises. Moreover, most studies treat cryptocurrency demand as a single outcome, focusing on returns and volatility without distinguishing between short-term speculative reactions and more persistent changes in usage. This limits our understanding of the role of digital assets not only as speculative instruments, but also as part of a broader adaptive financial response in the digital era.

This study addresses these gaps by providing a mechanism-based comparison between financial crises and sanctions as drivers of cryptocurrency demand. Specifically, we distinguish between two key channels: (i) short-term speculative demand arising from market uncertainty and risk repricing during financial crises, and (ii) persistent, transaction-driven demand resulting from constraints on payment and settlement systems under sanctions. By focusing on these distinct mechanisms, the study offers a more nuanced understanding of how different types of shocks shape cryptocurrency usage and how digital financial instruments may contribute to financial resilience under adverse conditions.

To implement this framework, we construct a dataset of financial crisis events and sanctions targeting financial infrastructure, thereby isolating shocks most relevant to the proposed mechanisms. Methodologically, we combine matched event-study analysis with persistence-aware dynamic models and volatility modeling techniques to examine both immediate responses and longer-term effects. This approach allows for a consistent comparison of the magnitude and persistence of cryptocurrency demand across different types of shocks, while also contributing to current discussions on digital transformation and resilience in the new global economy.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Financial Crises and Short-Term Speculative Demand

Financial crises represent periods of heightened uncertainty, market stress, and systemic liquidity constraints, which fundamentally alter investor behavior across financial markets. In such environments, rapid repricing of risk, deleveraging pressures, and portfolio rebalancing typically lead to increased trading activity and volatility. Within this context, cryptocurrencies have increasingly been examined as part of the broader financial system rather than as isolated alternative assets.

Empirical evidence consistently shows that cryptocurrency markets react strongly to crisis-related shocks. During periods such as the global financial disruptions associated with COVID-19, cryptocurrencies exhibit sharp increases in trading volume, return volatility, and correlations with traditional financial assets, particularly equities [2]–[4], [12]. These findings challenge the notion of cryptocurrencies as safe-haven assets and instead suggest that they behave similarly to high-risk financial instruments during periods of market stress.

From a theoretical perspective, these patterns can be explained by speculative demand and risk-driven trading behavior. Financial crises intensify information asymmetry and uncertainty, prompting investors to respond quickly to new information and short-term price movements. This leads to increased turnover and short-lived trading strategies aimed at exploiting volatility rather than supporting long-term holding or transactional use. In addition, the relatively low barriers to entry and high leverage available in cryptocurrency markets further amplify speculative dynamics during turbulent periods. Recent studies also document that macroeconomic announcements and geopolitical shocks trigger immediate and significant responses in cryptocurrency markets, particularly in terms of trading volume and volatility [8], [13]. These short-run reactions are consistent with the view that cryptocurrencies are highly sensitive to shifts in market sentiment and investor expectations.

In contrast, sanctions-related developments tend to evolve through gradual policy processes, including announcements, implementation, and enforcement stages. This gradual nature reduces the likelihood of abrupt speculative responses comparable to those observed during financial crises. Therefore, while both crises and sanctions may influence cryptocurrency markets, their short-term effects are expected to differ substantially. Based on this theoretical and empirical evidence, financial crises are expected to generate stronger short-run increases in speculative cryptocurrency demand than sanctions.

H1. Immediate speculative response: Financial crisis shocks generate stronger short-run increases in speculative cryptocurrency demand than sanctions shocks.

2.2. Sanctions and Persistent Transactional Demand

A parallel strand of literature focuses on the role of cryptocurrencies in environments characterized by financial repression, capital controls, and economic sanctions. Unlike financial crises, which primarily affect investor sentiment and market risk perceptions, sanctions, particularly those targeting financial infrastructure, directly constrain access to payment systems, international banking networks, and cross-border financial flows.

Early empirical evidence indicates that cryptocurrency adoption is higher in countries with weaker financial institutions and binding capital controls, where traditional financial channels are limited [9]. More recent studies extend this argument by showing that restrictions on cross-border payments and financial intermediation increase the incentives to use cryptocurrencies as alternative mechanisms for transferring value and maintaining economic activity [10], [11]. Empirical analyses using geopolitical risk measures, sanctions exposure indices, and country-level case studies generally find a positive association between sanctions intensity and cryptocurrency trading activity [5]. However, the underlying mechanism differs fundamentally from that observed during financial crises. Rather than reflecting speculative trading driven by uncertainty, increased cryptocurrency usage under sanctions is more closely linked to transactional needs arising from constraints in the formal financial system.

From a theoretical standpoint, sanctions that disrupt financial infrastructure create persistent frictions in payment and settlement processes. Economic agents, including firms and individuals, may turn to cryptocurrencies to bypass restrictions on international transfers, access liquidity, or preserve the ability to conduct cross-border transactions. In this context, cryptocurrency usage becomes a functional response to institutional constraints rather than a purely speculative activity.

Importantly, sanctions are typically long-lasting and may involve multiple layers of restrictions, including limitations on banking access, payment systems (e.g., SWIFT exclusions), and capital movements. As a result, their effects on cryptocurrency usage are likely to be persistent rather than temporary. Consistent with this view, both industry reports and recent academic evidence suggest that cryptocurrency activity in sanctioned environments remains elevated over time, reflecting sustained transactional demand rather than short-term market reactions [11]. This distinction highlights a key difference between financial crises and sanctions: while crises primarily generate short-lived, sentiment-driven fluctuations, sanctions induce structural adjustments in how economic agents access and use financial systems. Consequently, the impact of sanctions on cryptocurrency demand is expected to be more durable and transaction-oriented. Based on this reasoning, sanctions are expected to generate larger and more persistent increases in cryptocurrency demand compared to financial crises.

H2. Persistent transactional demand: Sanctions targeting financial infrastructure lead to larger and more persistent increases in cryptocurrency demand than financial crisis shocks.

3. METHODOLOGY

3.1. Data Collection and Variable Construction

The empirical analysis is conducted using daily data from January 2018 to December 2024, a period marked by both the intensified use of economic sanctions and multiple episodes of global financial instability. This timeframe encompasses major sanctions targeting financial infrastructure, as well as significant crisis events such as the COVID-19 shock and subsequent disruptions in global financial markets. By covering both types of shocks within a unified sample, the dataset enables a consistent comparison of their effects on cryptocurrency demand.

Cryptocurrency data are collected for Bitcoin (BTC) and Ethereum (ETH), which represent the largest and most liquid digital assets and are widely used as benchmarks in literature. For each asset, we obtain daily data on prices, trading volume, and market capitalization from major cryptocurrency data aggregators and exchange-level sources to ensure comprehensive market coverage and reliability.

To control global financial conditions, we include several macro-financial variables. These consist of the VIX index as a proxy for global risk sentiment, the U.S. dollar index (DXY) to capture international liquidity and currency strength, gold returns as a benchmark for traditional safe-haven demand, and S&P 500 returns to reflect overall equity market performance and risk appetite. All variables are aligned at a daily frequency and synchronized to a common trading calendar.

Measuring Cryptocurrency Demand

Consistent with the focus of this study, cryptocurrency demand is proxied by indicators of speculative market activity, which capture short-term trading behavior driven by investor sentiment, risk repricing, and portfolio reallocation.

Speculative demand is measured using three complementary variables. First, trading volume, defined as the natural logarithm of daily trading volume for BTC and ETH, captures the overall level of market participation and trading intensity. Higher trading volume typically reflects increased investor engagement and is commonly associated with speculative activity [12], [14]. Second, the turnover ratio, calculated as trading volume scaled by market capitalization, provides a relative measure of trading intensity that accounts for changes in asset size. This measure reflects how actively an asset is traded relative to its market value and is widely used to capture speculative trading behavior and short-term repositioning [2], [13]. Third, realized volatility, measured as the 30-day rolling standard deviation of daily log returns, captures short-term price fluctuations arising from rapid information incorporation and sentiment-driven trading. Unlike model-based volatility measures, realized volatility reflects actual market activity and is therefore well suited to capturing speculative dynamics in cryptocurrency markets [12], [14]. These measures provide a comprehensive representation of speculative demand, allowing us to examine both trading intensity and risk-driven price behavior.

Sanctions events are identified based on official policy announcements issued by major authorities, including the U.S. Treasury (OFAC) and the European Union Council. These events are cross-validated using established sanctions databases and prior academic studies [6], [9]. To ensure consistency with the proposed mechanism, the sample is restricted to financial-infrastructure sanctions, defined as measures that directly affect payment systems, correspondent banking relationships, access to foreign reserves, or cross-border settlement channels. Sanctions that are purely symbolic, trade-related, or limited to individuals are excluded. Based on these criteria, a set of high-impact sanctions events is constructed, each dated according to the initial public announcement, which represents the information arrival point for financial markets. Events overlapping with unrelated major shocks are excluded to preserve identification clarity.

Financial crisis events are identified using discrete indicators of systemic financial stress, following established approaches in the financial economics literature [2], [12], [15]. These events include major banking-sector disruptions, abrupt and sustained equity market declines, and episodes of exceptionally high market volatility. Each crisis event is dated based on the first public signal of systemic distress, such as the announcement of a bank failure or emergency policy intervention. Similar to the sanctions sample, overlapping events and extended crisis periods are excluded to maintain clear event boundaries.

Table 1. Identified Sanctions and Financial Crisis Events

Category	Event Date (t_0)	Event Summary	Primary Transmission Channel
Sanctions	2018-11-05	The United States reinstated sanctions on Iran, focusing on banking restrictions and international financial transactions following its withdrawal from the JCPOA	Disruption of payment networks; restrictions on correspondent banking
Sanctions	2022-02-26	Joint EU–U.S. action to remove major Russian banks from the SWIFT network, limiting access to global payment systems	Breakdown of cross-border payment infrastructure
Sanctions	2022-03-02	Expansion of financial sanctions targeting Russian institutions, restricting international banking and transaction settlement	Impairment of clearing and settlement systems
Sanctions	2023-06-23	U.S. Treasury imposed additional sanctions affecting cross-border financial flows linked to restricted jurisdictions	Restrictions on international payment channels and banking links
Financial Crisis	2020-03-11	WHO declared COVID-19 a global pandemic, triggering a widespread collapse in financial markets	System-wide stress; liquidity contraction
Financial Crisis	2022-06-13	Heightened global financial instability amid aggressive monetary tightening and significant equity market declines	Broad-based risk repricing
Financial Crisis	2023-03-19	Emergency acquisition of Credit Suisse by UBS to prevent systemic instability in global banking	Financial sector instability
Financial Crisis	2023-10-27	Sharp increase in global market volatility driven by renewed stress in banking and bond markets	Elevated financial market uncertainty

3.2. Research Design

To examine how financial crises and sanctions affect cryptocurrency demand through distinct channels and time horizons, this study adopts a two-stage empirical strategy aligned with the hypotheses. Specifically, we distinguish between short-run speculative responses (H1) and persistent demand dynamics (H2) by combining an event-study framework with a dynamic demand model. This design allows for a consistent comparison of the immediate impact and the duration of effects across different types of shocks.

3.2.1. Event-Study Framework

To assess immediate market reactions to sanctions and financial crisis shocks, we employ a matched event-study design, which is widely used to identify short-run responses to discrete information events [16], [17]. For each event eee, we compute abnormal changes in cryptocurrency demand over symmetric event windows $[t_{0-k}, t_{0+k}]$, where t_0 denotes the event date. Abnormal demand is defined as the deviation of the observed value from its pre-event benchmark, as specified in Eq. (1).

This approach enables us to isolate the immediate effect of each shock by comparing observed market behavior around the event with normal conditions prior to the event. In particular, the framework focuses on short-run speculative demand, captured by indicators such as trading volume, turnover, and volatility, which are sensitive to rapid changes in investor sentiment and market expectations. By avoiding the imposition of a dynamic structure, the event-study design provides a clean and direct measure of immediate reactions, allowing for a consistent comparison of how sanctions and financial crises differ in their short-term impact on cryptocurrency markets.

$$AD_t^{(e)} = D_t^{(e)} - \underline{D}_{pre}^{(e)} \tag{1}$$

where $D_t^{(e)}$ is the observed demand measure at time t and $\underline{D}_{pre}^{(e)}$ is the average demand over the estimation window prior to the event.

This section focuses on short-run speculative demand, which is proxied using several key indicators. Trading volume of major cryptocurrencies such as Bitcoin (BTC) and Ethereum (ETH) is used to capture overall market activity and investor participation; sudden increases in volume are typically associated with speculative trading behavior. The turnover ratio is included to measure trading intensity relative to market size, reflecting the extent of short-term portfolio rebalancing and active trading. In addition, return-based measures, such as cumulative abnormal returns (CAR), are employed to capture abnormal price reactions to new information and event announcements. Volatility measures, whether realized or conditionally estimated, are also considered, as they reflect market uncertainty and rapid repricing, both of which are central characteristics of speculative dynamics.

To evaluate the timing and magnitude of market responses, we employ multiple symmetric event windows around each event date. Specifically, the window [−1,+1] captures immediate reactions, the window [−3,+3] serves as the baseline specification for short-run responses, and the window [−5,+5] allows for the assessment of short-term persistence and delayed adjustments. This multi-window design is particularly suitable for cryptocurrency markets, where trading occurs continuously and information is incorporated rapidly into prices and trading behavior.

3.2.2. Dynamic Demand Model

While event-study methods are well suited to identifying immediate market reactions to discrete events, they do not capture the dynamic nature of cryptocurrency demand, which is widely documented to exhibit strong persistence over time. In particular, trading activity and volatility in cryptocurrency markets tend to display inertia, whereby shocks are not fully absorbed within short event windows but instead propagate over subsequent periods [12], [14]. As a result, focusing solely on short-run responses may lead to an incomplete assessment of how different shocks influence market behavior.

To address this limitation, we complement the event-study analysis with a dynamic demand model, as specified in Eq. (2), which incorporates temporal dependence. This approach allows us to examine not only the immediate impact of sanctions and financial crises but also the extent to which these effects persist over time. By including a lagged dependent variable, the model captures demand inertia and distinguishes between transitory shocks and sustained changes in market activity.

The model is estimated using key proxies of speculative demand, including trading volume, turnover, and volatility for major cryptocurrencies such as Bitcoin (BTC) and Ethereum (ETH). These variables reflect different dimensions of speculative behavior, ranging from trading intensity to risk-driven price fluctuations. Within this framework, the coefficients associated with the sanction indicator γ (gamma) and the crisis indicator δ (delta) measure the respective impact of each type of shock on cryptocurrency demand, after controlling for persistence and global financial conditions. Importantly, the relative magnitude and statistical significance of γ (gamma) and δ (delta) provide a direct test of the core research question, namely, which type of shock has a stronger and more persistent effect on cryptocurrency demand. A larger and more persistent coefficient for sanctions would indicate that these shocks induce sustained changes in market activity, whereas a stronger but short-lived crisis effect would be consistent with temporary, sentiment-driven responses.

$$\Delta D_t = \alpha + \beta\Delta D_{t-1} + \gamma Sanc_t + \delta Cris_t + \theta ControlVariables_t + \varepsilon_t \quad (2)$$

The key explanatory variables in the model consist of two event indicators capturing the effects of sanctions and financial crises. The variable Sanc is a dummy variable that takes the value of 1 during sanction periods, particularly those targeting financial infrastructure such as payment systems, banking access, or cross-border settlement, and 0 otherwise. This variable is intended to capture the impact of structural constraints imposed on financial and payment systems. The variable Cris is also specified as a dummy variable, equal to 1 during periods of financial crisis and 0 otherwise, reflecting the effect of market-wide uncertainty, liquidity stress, and risk repricing.

To account for the persistence of cryptocurrency demand, the model includes a lagged dependent variable, ΔD_{t-1}, which represents the one-period lag of the change in demand. This term captures demand inertia, acknowledging that shocks to cryptocurrency activity may not dissipate immediately but instead persist over time. A positive and statistically significant coefficient β (beta) on this lagged variable indicates that changes in demand are persistent, which is central to testing H2. In particular, persistence allows us to distinguish between the short-lived effects typically associated with financial crises and the more sustained effects expected under sanctions.

In addition, the model incorporates a set of control variables to isolate the effects of sanctions and crises from broader macro-financial conditions. These include the VIX (Volatility Index), which serves as a proxy for global risk sentiment and uncertainty; the US Dollar Index (DXY), which captures global liquidity conditions and currency strength; gold returns, representing safe-haven demand in traditional financial markets; and S&P 500 returns, reflecting overall equity market performance and investor risk appetite. The inclusion of these controls ensures that the estimated effects of sanctions and crises are not confounded by general movements in global financial conditions.

4. RESEARCH RESULTS

4.1. Variable Description

Table 2 presents descriptive statistics for the main variables used in the analysis, including cryptocurrency demand proxies and global financial control variables over the 2018–2024 period. The summary statistics reveal several key features that inform the empirical design.

First, speculative activity in cryptocurrency markets exhibits substantial variability. The logarithm of Bitcoin trading volume averages 23.68 with a standard deviation of 0.79, while Ethereum trading volume shows slightly greater dispersion. Turnover ratios for both assets remain relatively low on average but display considerable variation, suggesting that trading intensity fluctuates sharply over time. These patterns indicate that speculative demand is not stable but characterized by episodic surges, consistent with short-run reactions to market shocks. Second, volatility measures further highlight the risk-driven nature of cryptocurrency markets. Bitcoin's realized volatility, calculated as the 30-day rolling standard deviation of daily log returns, averages 3.41% per day, while Ethereum exhibits higher average volatility at 4.40%. Both assets show wide dispersion and pronounced upper extremes, reflecting periods of intensified uncertainty and rapid price adjustments. This behavior supports the view that cryptocurrency markets are highly sensitive to changes in investor sentiment and external shocks. In contrast, global financial variables display more stable dynamics. The VIX index, which proxies global risk sentiment, shows substantial variation with occasional spikes during periods of market stress. The U.S. dollar index (DXY) fluctuates within a narrower range, reflecting relatively stable global liquidity conditions. Equity and gold returns exhibit typical financial market behavior, with moderate variability and occasional extreme observations.

Overall, these descriptive statistics highlight two important features. First, cryptocurrency demand, proxied by trading activity and volatility, is highly volatile and prone to short-lived spikes, supporting the relevance of an event-based approach for capturing immediate reactions (H1). Second, the observed persistence in trading measures and volatility justifies the use of dynamic models to examine whether shocks have lasting effects over time (H2).

Table 2. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Log BTC Volume	23.68	0.79	21.80	26.58
BTC Turnover	0.0064	0.0049	0.0007	0.0345
BTC Volatility (30-day)	0.0341	0.0151	0.0089	0.1036
Log ETH Volume	22.88	0.90	20.67	25.16
ETH Turnover	0.0059	0.0046	0.0006	0.0318
ETH Volatility (30-day)	0.0440	0.0184	0.0081	0.1264
Stablecoin Dominance	0.24	0.12	0.02	0.58
Stablecoin Volume Share	0.24	0.12	0.02	0.58
VIX	22.6	10.9	9.1	82.7
DXY	97.8	6.2	89.2	114.1
Equity Returns	0.0004	0.0126	−0.127	0.093
Gold Returns	0.0003	0.0098	−0.086	0.084

4.2. Results and Discussions

4.2.1. Results for Event-Study

We calculate mean abnormal demand (AD) and standardized abnormal demand (SAD) around sanctions and financial crisis events. AD is computed as the deviation of demand from its pre-event average. SAD standardizes AD by the pre-event standard deviation, allowing comparison across demand measures and assets.

Table 3 reports abnormal and standardized abnormal demand across event windows. Panel A shows that financial crises generate substantially larger speculative demand responses than sanctions, particularly over short windows, with effects decaying as the window expands. Panel B shows the opposite pattern for transactional demand: sanctions generate increasingly large standardized abnormal responses for stablecoin dominance and volume share over wider windows, indicating gradual adjustment rather than immediate reaction.

Table 3. Event-Study Results: Abnormal and Standardized Abnormal Demand

Panel A. Speculative Demand (BTC & ETH)					
Shock Type	Window	AD (Log Volume)	SAD (Log Volume)	AD (Turnover)	SAD (Turnover)
Sanction	[−1, +1]	0.10	0.59	0.0037	0.54
	[−3, +3]	0.09	0.54	0.0034	0.49
	[−5, +5]	0.06	0.35	0.0025	0.31
Crisis	[−1, +1]	**0.18**	**0.98**	**0.0061**	**1.02**
	[−3, +3]	**0.14**	**0.81**	**0.0049**	**0.85**
	[−5, +5]	**0.09**	**0.54**	**0.0031**	**0.57**
Panel B. Transactional (Settlement) Demand (Stablecoins)					
Shock Type	Window	AD (Dominance)	SAD (Dominance)	AD (Volume Share)	SAD (Volume Share)
Sanction	[−1, +1]	0.012	0.21	0.014	0.24
	[−3, +3]	0.028	**0.46**	0.031	**0.49**
	[−5, +5]	0.039	**0.63**	0.044	**0.67**
Crisis	[−1, +1]	0.010	0.18	0.011	0.19
	[−3, +3]	0.013	0.22	0.014	0.23
	[−5, +5]	0.012	0.19	0.013	0.20

*Note**:** Bold values indicate the dominant response within each demand channel.*

The event-study results show that speculative demand, proxied by Bitcoin and Ethereum trading volume and turnover, responds differently to sanctions and financial crisis shocks. Financial crisis events generate large and immediate positive standardized abnormal demand, particularly over the shortest [−1,+1] window. These responses indicate sharp increases in speculative trading activity, consistent with panic trading and rapid risk repricing during periods of systemic stress. However, the magnitude of SAD declines as the event window expands, suggesting that speculative responses are short-lived and dissipate quickly once information is absorbed. In contrast, sanctions targeting financial infrastructure are associated with moderate but weaker speculative responses. While positive abnormal demand is observed immediately following sanction announcements, the standardized effects diminish over wider event windows. This pattern indicates that sanctions do not trigger sustained speculative trading comparable to financial crises, but instead generate only temporary attention-driven reactions.

A markedly different pattern emerges for transactional demand, proxied by stablecoin dominance and stablecoin trading volume share. For sanctions events, standardized abnormal demand for stablecoin-based measures is positive and increases with the length of the event window. Effects are relatively small in the immediate [−1,+1] window but become more pronounced over [−3,+3] and [−5,+5] windows, indicating gradual adjustment rather than instantaneous reaction. This delayed but persistent response suggests that sanctions induce a progressive shift toward stablecoins as instruments for settlement, liquidity management, and cross-border transactions. Unlike speculative trading, which reacts sharply and fades quickly, transactional demand appears to adjust over time as users adapt to constraints on traditional financial infrastructure. Financial crisis events, by contrast, exhibit weaker and less persistent effects on stablecoin-based measures, reinforcing the view that crises primarily affect cryptocurrencies through speculative rather than transactional channels.

The event-study evidence highlights a clear asymmetry across both shock types and demand channels. Financial crises predominantly generate short-run speculative responses characterized by sharp but transitory increases in trading activity, while sanctions targeting financial infrastructure lead to more persistent increases in transactional cryptocurrency demand, particularly through stablecoins.

4.2.2. Results for Dynamic Demand Model

The dynamic demand estimates confirm strong short-run adjustment dynamics across all cryptocurrency demand measures. The lagged dependent variable is highly significant for trading volume, turnover, and stablecoin volume share, indicating rapid mean reversion in changes of demand once persistence is controlled for. For realized volatility, the lag term is positive and significant for both Bitcoin and Ethereum, implying that increases in uncertainty tend to persist even after trading activity normalizes. These results validate the use of a dynamic specification and suggest that ignoring demand inertia would overstate the role of contemporaneous shocks.

For speculative demand, sanction windows do not significantly affect trading volume or turnover for either Bitcoin or Ethereum within the ±3-day horizon. However, sanctions are associated with statistically significant increases in realized volatility for both assets, with particularly strong effects for Ethereum. This pattern indicates that sanctions primarily operate through heightened uncertainty and price discovery rather than through immediate increases in speculative trading participation. Crisis windows, by contrast, exhibit weaker and generally insignificant effects on speculative demand once persistence and global financial conditions are taken into account.

A different response is observed for transactional demand. Sanction windows are associated with a small but statistically significant decline in stablecoin dominance, while no significant effects are detected for stablecoin volume share. This suggests that short-run sanction effects do not immediately translate into greater stablecoin usage relative to the broader crypto market, possibly reflecting slower institutional and operational adjustments in settlement behavior. Crisis windows do not exert significant short-term effects on stablecoin-based measures in the dynamic framework.

Overall, the ±3-day dynamic results indicate that sanctions and crises do not trigger immediate shifts in trading intensity or transactional usage once demand persistence is controlled for. Instead, sanctions manifest primarily through short-run increases in volatility, while adjustments in trading activity and stablecoin adoption appear to unfold more gradually over longer horizons.

Table 4. Dynamic Demand Model with Event-Window Dummies (±3 Days)

Dependent variable: ΔDemand Method: OLS with Newey–West HAC standard errors (maxlags = 7) Event window: ±3 trading days around event dates Controls: ΔVIX, ΔDXY, Gold returns, S&P 500 returns			
Panel A. Speculative Demand – Bitcoin (BTC)			
Variable	Δlog Volume	ΔTurnover	ΔVolatility
ΔD_{t-1}	−0.3292***	−0.2824***	0.0493*
	(−11.15)	(−3.95)	(1.80)
SanctionW (±3)	0.0337	0.0004	0.0009
	(0.95)	(0.28)	(2.49)
CrisisW (±3)	0.0396	0.0247	0.0032*

	(0.58)	(1.31)	(1.71)
Observations	1,506	1,506	1,506
Adj. R^2	0.1069	0.0930	0.0491
Panel B. Speculative Demand – Ethereum (ETH)			
Variable	Δlog Volume	ΔTurnover	ΔVolatility
ΔD_{t-1}	−0.2923***	−0.2026***	0.0624**
	(−11.31)	(−2.66)	(2.05)
SanctionW (±3)	0.0354	0.0007	0.0007*
	(0.96)	(0.25)	(3.32)
CrisisW (±3)	0.0528	0.0575	0.0030
	(0.89)	(1.36)	(1.54)
Observations	1,506	1,506	1,506
Adj. R^2	0.0883	0.0698	0.0437
Panel C. Transactional Demand – Stablecoins			
Variable	ΔStablecoin Dominance		ΔStablecoin Volume Share
ΔD_{t-1}	−0.0961*		−0.4783***
	(−1.88)		(−16.52)
SanctionW (±3)	−0.0018		−0.0119
	(−2.20)		(−0.68)
CrisisW (±3)	0.0020		−0.0978
	(1.07)		(−1.01)
Observations	837		837
Adj. R^2	0.0198		0.2263

*Notes: t-statistics (HAC-robust) are reported in parentheses; ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.*

5. DISCUSSION, IMPLICATIONS, AND CONCLUSION

This study provides a systematic comparison of how financial crises and sanctions affect cryptocurrency demand, with a focus on distinguishing short-run speculative responses from potentially more persistent demand dynamics. By combining event-study analysis with dynamic modeling, the findings reveal a clear asymmetry in how different types of shocks influence cryptocurrency markets. More broadly, the results contribute to understanding the role of digital finance in the new global economy, especially under conditions of disruption and adjustment.

The event-study results offer strong support for H1, showing that financial crises generate larger and more immediate increases in speculative demand than sanctions. Across short event windows, crisis episodes are associated with pronounced spikes in trading volume, turnover, and volatility, reflecting rapid portfolio rebalancing and risk repricing. These effects, however, decay quickly as the event window expands, indicating that speculative reactions are short-lived and primarily driven by temporary shifts in investor sentiment. This pattern is consistent with the broader literature, which characterizes cryptocurrencies as high-risk assets that respond strongly to market-wide uncertainty rather than serving as stable hedging instruments. In contrast, sanctions targeting financial infrastructure produce weaker immediate responses in speculative demand. Although some increase in trading activity is observed following sanction announcements, the magnitude is smaller and dissipates more quickly compared to crisis-driven reactions. This suggests that sanctions do not trigger the same level of panic trading or rapid repositioning observed during systemic financial stress. Instead, their effects appear to operate through more gradual and indirect channels, which is particularly relevant in a context where digital financial instruments may serve as adaptive alternatives when conventional channels are constrained.

The dynamic demand model provides further insights into the persistence of these effects and offers partial support for H2. Once demand inertia and global financial conditions are controlled for, both sanctions and crisis shocks exhibit no statistically significant immediate impact on trading volume and turnover. However, the strong significance of the lagged dependent variable across most specifications confirms that cryptocurrency demand is highly persistent. This finding highlights the importance of accounting for dynamic adjustment processes when evaluating the impact of external shocks and suggests that digital asset markets may evolve through cumulative responses rather than only through isolated event reactions.

Importantly, the results indicate that crisis-driven effects are largely transitory, while sanction-related effects, although weaker in the short run, may contribute to more gradual adjustments in market behavior. In particular, sanctions are associated with increases in volatility rather than trading intensity, suggesting that their primary impact operates through heightened uncertainty and information frictions rather than immediate participation in speculative trading. This distinction reinforces the idea that different types of shocks influence cryptocurrency markets through fundamentally different mechanisms and highlights how digital finance may respond differently to temporary stress than to structural financial restrictions.

The findings suggest that financial crises primarily affect cryptocurrency markets through short-run speculative channels, characterized by sharp but temporary increases in trading activity and volatility. In contrast, sanctions have no statistically significant immediate effect on trading volume or turnover; their influence operates instead through a significant increase in realized volatility, which is consistent with a more gradual adjustment in market conditions rather than an immediate surge in trading. This difference in temporal dynamics provides a more nuanced understanding of how cryptocurrencies respond to external shocks and how digital financial activity adjusts under different forms of pressure.

From a policy perspective, these results carry important implications. The strong short-term response of cryptocurrency markets to financial crises suggests that digital assets are highly sensitive to global risk conditions, which may amplify market instability during periods of stress. At the same time, the potentially more persistent effects associated with sanctions indicate that restrictions on financial infrastructure may have unintended consequences by gradually altering patterns of cryptocurrency usage and market behavior. This highlights the need for policymakers to consider not only the immediate effects of sanctions but also their longer-term implications for financial system adaptation, digital transformation, and the evolving role of cryptocurrencies in supporting financial resilience.

This study contributes to the literature by providing a unified framework that compares sanctions and financial crises within a single empirical setting, while distinguishing between short-run and persistent effects. By focusing on demand dynamics rather than solely on returns or correlations, the analysis offers a more direct assessment of how different shocks influence cryptocurrency markets. It also contributes to broader discussions on how digital financial systems respond to instability in the global economy. Nevertheless, several limitations should be acknowledged. First, the analysis focuses on major cryptocurrencies such as Bitcoin and Ethereum, which may not fully capture the heterogeneity of the broader crypto ecosystem.

Second, the identification of events, while carefully constructed, may still be subject to overlapping information shocks or unobserved confounding factors. Third, the use of daily data, while appropriate for capturing short-run dynamics, may not fully reflect intraday adjustment processes.

Future research could extend this framework by incorporating higher-frequency data, exploring cross-exchange dynamics, or examining the role of alternative crypto assets and decentralized finance platforms. Additionally, further work could investigate how regulatory responses interact with these shocks to shape cryptocurrency market development and the broader process of digital financial adaptation.

In conclusion, the evidence suggests that financial crises and sanctions influence cryptocurrency demand in fundamentally different ways. Financial crises trigger strong but short-lived speculative responses, while sanctions generate weaker but potentially more persistent effects. Understanding this distinction is essential for both researchers and policymakers seeking to assess the evolving role of cryptocurrencies in the global financial system and in the wider context of digital transformation and resilience.

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