Accounting for Cryptocurrencies[*]

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Abstract

Corporate interest in cryptocurrencies is growing quickly, with Bitcoin and Ether emerging as the top-of-mind digital assets. This paper studies how U.S. public firms account for crypto assets using a hand-collected sample from 2013 to 2021. Our analyses yield three key findings. First, although corporate crypto holdings are rising, it is difficult to estimate the landscape due to the lack of disclosure requirements and authoritative rules. Second, firms exercise considerable discretion in accounting for and disclosure of crypto holdings. Our sample includes firms using both fair value accounting and accounting for indefinite-lived intangible assets, with the latter being more prevalent recently. We also observe variations in impairment test assumptions and the extent of fair value disclosures. Third, consistent with theory, firms, if unguided, are more likely to adopt fair value accounting or make fair value disclosures when cryptocurrencies are more liquid. Our results are timely and informative as crypto accounting is a current topic on the FASB's recognition and measurement agenda, with authoritative rule setting underway.

JEL classifications: M40, M41, M48

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1. Introduction

Cryptocurrencies are decentralized digital currencies that rely on cryptography for security and blockchain for record keeping. Cryptocurrencies have been controversial ever since Bitcoin (BTC) was introduced in 2008. To advocates, cryptocurrencies emblematize a disruptive technology that can potentially reshape the world by democratizing financial markets, keeping institutions honest and records traceable, and providing a safe and inflation-proof store of value. Skeptics, however, disdain cryptocurrencies as environmentally unfriendly and intrinsically worthless tools for speculators and criminals. The size of the cryptocurrency (or "crypto") market stayed modest in earlier years, but grew exponentially during the COVID-19 pandemic, reaching a peak of $3 trillion in November 2021. Although crypto market value declined along with other assets in 2022, there are still over 21,000 types of cryptocurrencies and tokens traded with a total market value of nearly $1 trillion today. Notably, BTC and Ether (ETH), the two most prominent cryptocurrencies, account for over half of the market value. Despite its controversy and fluctuation in value, the crypto market has maintained its appeal for individuals, corporations, and institutions, as firms are wading into this space by engaging in crypto mining/staking, accepting crypto payments, allocating cash to crypto assets as an investment or diversification strategy, or providing crypto trading or lending services.[1,2]

The growing corporate interest in crypto raises a natural question: how do public reporting entities account for crypto holdings in regulatory filings? This question is practical because crypto carries "probable future economic benefits," arguably fitting the definition of "assets." Thus,

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[1] In addition to cryptocurrencies, other digital assets that utilize cryptography technology (e.g., non-fungible tokens, utility tokens) also qualify as crypto assets. For brevity, we use "crypto assets" as an umbrella term for all such assets and "crypto accounting" as a short form for the accounting of such assets.

[2] Recent examples include Google entering a partnership with Coinbase to accept crypto payments for its cloud services, BlackRock launching a new private spot Bitcoin trust in response to the increasing demand from U.S. institutional investors, and Man Group planning to start a crypto hedge fund. See Section 2 for a more detailed overview and outlook of the crypto market.

reporting entities should provide information about crypto holdings that is useful for decision making under the Financial Accounting Standards Board's (FASB's) Conceptual Framework (FASB 2008). However, cryptocurrencies are distinct from the existing codified assets because: (1) they function similarly to currencies as a medium of exchange and a store of value but lack the governmental or commodity backing necessary to be considered cash; (2) they do not have a stated maturity and are too volatile to be considered cash equivalents; and (3) they entitle holding entities to economic benefits but typically do not attach ownership interests or contractual rights necessary to be considered financial instruments (FASB 2022a).

The question of accounting treatment is also timely because U.S. GAAP currently offers no authoritative guidance or rules that specifically address the reporting or disclosure for corporate crypto holdings. The lack of authoritative rules led each of the Big 4 accounting firms and American Institute of Certified Public Accountants (AICPA) to issue non-authoritative guidance between 2018 and 2019 that recommends accounting for crypto holdings as intangible assets (Deloitte 2018; EY 2018; KPMG 2018; PwC 2018; AICPA 2019). However, financial statement users (e.g., analysts and investors) have increasingly voiced the concern that the use of intangible asset accounting makes it difficult to evaluate firms with material crypto holdings, suggesting that the prevailing accounting treatment fails to meet the objective of the FASB's Conceptual Framework (Bloomberg 2021). The FASB released an agenda consultation in 2021 to publicly solicit comments on currently debated topics, including crypto accounting, and most commenters recommended that the Board consider a fair value accounting approach for crypto assets. Taking into account this recommendation, the Board reached a tentative decision in October 2022 that settled on the use of fair value accounting for the measurement of corporate crypto assets (WSJ 2022a). However, as of December 2022, crypto accounting remains one of the five topics in the

initial deliberations stage on the FASB's standards setting agenda for recognition and measurement, suggesting that some important decisions are yet to be made (e.g., whether to create a new codified category specifically for crypto assets and how to determine the fair value for different types of crypto assets) (FASB 2022b).

This paper documents the progression of crypto accounting, both in terms of reporting and disclosure, for U.S. public entities. Our goal is to inform standard setters in three primary ways. First, we examine whether corporate crypto holdings are pervasive enough to warrant rule setting efforts by outlining the landscape of such holdings disclosed by U.S. firms. Second, we document the status quo of corporate crypto accounting by summarizing the variety of reporting and disclosure choices made by U.S. firms in practice. Third, we shed light on whether liquidity plays a role in firms' fair value reporting and disclosure choices.

We begin by identifying a sample of U.S. firms with crypto holdings disclosed in periodic financial reports filed with the Securities and Exchange Commission (SEC). To do so, we first search for crypto-related keywords within the footnotes of financial statements included in quarterly filings, as our initial screening reveals that firms with crypto involvement almost always disclose and discuss their holdings, if any, in financial statement footnotes. If there is at least one footnote containing a matched keyword(s), we then read the entire report to manually extract and categorize information about the reporting and disclosure choices that the firm makes in its crypto accounting. The resulting sample contains 438 firm-quarter observations for reporting periods ending between December 31, 2013 and December 31, 2021. Using this sample, we conduct three sets of analyses.

The first set of analyses quantify the aggregate corporate crypto holdings disclosed by U.S. firms, and, more importantly, gauge the trend in reported holdings. We estimate that the combined

value of crypto holdings disclosed in SEC filings started around $16.4 million in 2013Q4, stayed relatively flat and averaged $25.8 million between 2013Q4 and 2019Q3, and sharply rose to $54.3 billion by 2021Q4. We find that this growth is explained by increases in crypto prices, the quantities of crypto held, and the number of firms holding crypto, in that order. Although both the number of entities holding crypto assets and the aggregate size of their holdings may appear modest, our estimates represent a lower bound and demonstrate a clear, rising trend.[3] Corporate crypto holdings are becoming not only more pervasive but also increasingly material. For our sample, the median crypto holdings-to-assets ratio (based on carrying values reported on balance sheets) increases from 0.9 percent in 2013 to 7.4 percent in 2021 and the median percentage of quarterly profits/losses from crypto transactions, in absolute terms, increases from 2.5 percent in 2013 to 5.4 percent in 2021. We also observe diversification in the reported holding objectives; firms may hold crypto as a result of conducting transactions (e.g., accepting them as payments), investing, mining, or raising capital through an initial coin offering (ICO), with transaction and mining being the most common objectives before and after 2017 (65 and 45 percent, respectively).

The second set of analyses provide an overview of the reporting and disclosure choices that U.S. firms make in accounting for their crypto holdings. We observe significant time-series and cross-sectional variations in virtually every crypto accounting choice made in practice. In the first quarter of our sample (2013Q4), 50 percent of firm-quarters use fair value accounting. This percentage drops to 32 percent by 2018Q3 and further declines to 20 percent by 2021Q4, which is not surprising given the non-authoritative guidance issued by the Big 4 accounting firms and

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[3] These estimates represent a lower bound of the true corporate crypto holdings for three reasons. First, Grayscale is not required to file with the SEC for all of its investment vehicles. Second, we are only able to include the quarter-end fair value of a firm's crypto holdings if one is given in the SEC filings or can be reasonably inferred based on disclosed information. Third, our observations are limited to firms that explicitly disclose information about their crypto holdings in their SEC filings. We discuss this in further detail and provide examples in Section 3.

AICPA. Even with more firms shifting toward intangible asset accounting, their accounting and disclosure choices remain diverse. We focus on two of those choices. First, under intangible asset accounting, firms are required to record assets at cost and perform periodic impairment tests, but they exercise discretion over the choice of impairment trigger. Through 2019, 93 percent of firms that disclose their impairment trigger use the price at the reporting period-end, such that a write-down is needed when the period-end price falls below the carrying value. Beginning in 2020, however, we observe a shift toward using the lowest price since acquisition as an impairment trigger. As of 2021Q4, 77 percent of firms that disclose their impairment trigger apply this assumption, resulting in more frequent impairment losses and lower carrying values. Second, firms that apply intangible asset accounting may also choose whether and how to disclose information related to the fair value of their crypto holdings. In our sample of observations that use intangible asset accounting, 35 percent of firm-quarters provide some level of fair value disclosure. However, this number varies substantially over time, hovering around 63 percent prior to 2016, declining to 23 percent through 2019, and then rising back to 47 percent in 2021Q4. Disclosures also range from giving a single point estimate of the fair value to providing detailed information on the inputs used to determine the fair value, including price and/or quantity.

The third set of analyses evaluates whether crypto market liquidity plays a role in a firm's decision to adopt fair value accounting or make fair value disclosures for its crypto holdings. There are three primary drivers of our focus on liquidity. First, theory predicts that fair value accounting is more useful than historical cost accounting when the assets of interest are more liquid (Plantin, Sapra, and Shin 2008; Allen and Carletti 2008). Second, liquidity is a defining characteristic of crypto assets because the value of a cryptocurrency or token critically depends on its adoption and circulation. While the earliest and most prominent cryptocurrencies (e.g., BTC, ETH) are mostly

liquid, many other obscure altcoins are thinly traded, particularly during market downturns when liquidity dries up. The recent collapses of algorithmic stablecoin TerraUSD and FTT, the token of FTX exchange, highlight this liquidity risk.[4],[5] Third, the importance of liquidity is recognized in practice. For example, the AICPA's Financial Reporting Executive Committee recommended in a comment letter to the FASB that "fair value [for crypto assets] should be required or optional when a liquid market exists" (AICPA 2021, p. 3). Moreover, Japanese GAAP recommends the fair value accounting approach only for crypto assets traded on active markets, and a historical cost accounting approach for crypto assets not actively traded (ASBJ 2018).

To shed light on how the liquidity of the crypto market relates to firms' accounting and disclosure choices, we examine two decisions: the choice of accounting policy and extent of voluntary fair value disclosures. Our evidence suggests that firms are more likely to apply fair value accounting to crypto holdings when the reporting period liquidity of the crypto markets is higher. Not surprisingly, this evidence is limited to the pre-guidance period (i.e., before 2018Q3 when the Big 4 accounting firms and AICPA began issuing guidance suggesting that intangible asset accounting is appropriate for crypto). We also find that firms applying intangible asset accounting are more likely to make voluntary fair value disclosures when the reporting period liquidity of crypto markets is higher and price impact is lower. Combined, these two results are consistent with theory and suggest that liquidity plays a role in crypto-related accounting and disclosure choices.

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[4] For context, 45 percent of firm-quarters in our sample hold only BTC and ETH, while 55 percent also hold other cryptocurrencies. For the latter group, the lack of disclosure requirements makes it difficult to determine the liquid and illiquid portions of their crypto holdings.

[5] Unlike exchange-traded financial instruments, most cryptocurrencies are decentralized so it is common to observe discrepancies in their pricing across different exchanges or platforms. For example, there is no standard or global price for BTC at a given time. As a result, most BTC price trackers (i.e., Google) calculate an average price based on the transaction history of a prominent exchange. Pricing discrepancies are exacerbated with illiquid crypto assets such as non-fungible tokens (WSJ 2022b), creating significant challenges in the determination of their fair value.

This paper is one of the first to study the accounting choices for corporate crypto holdings, and fits in the vast accounting literature on recognition. To our knowledge, the only other paper in this space is a concurrent paper by Luo and Yu (2022), who analyze annual filings of 40 global firms in 2020 with known exposure to cryptocurrencies to illustrate how firms' crypto accounting practices differ between IFRS and U.S. GAAP. Our study differs in that we identify all SEC reporting firms with disclosed crypto holdings in their regulatory filings to quantify the growth in disclosed corporate crypto holdings from 2013 to 2021 and to study both the progression of and basis for the accounting and disclosure choices related to these holdings under U.S. GAAP.

Our study also closely relates to the stream of studies that debate the pros and cons of fair value accounting, with the central issue being whether (and when) fair value accounting is more informative than historical cost accounting. Although the empirical evidence remains mixed (e.g., Barth 1994, 1996; Barth and Landsman 1995; Barth, Beaver, and Landsman 1996, 2001; Landsman 2007; Laux and Leuz 2009), theory offers useful frameworks to navigate the debate (Plantin, Sapra, and Shin 2008; Allen and Carletti 2008). While both models show that fair value accounting is more informative than historical cost accounting when assets are liquid, the former notes that the benefits decrease if assets are long-lived. Cryptocurrencies have indefinite lives but can be liquid or illiquid depending on the type. Our findings with these unique assets are consistent with the theoretical prediction that firms are more likely to adopt fair value accounting and provide fair value disclosures when the crypto market is more liquid during the reporting period.[6]

More generally, our paper adds to a growing literature on crypto. A majority of the existing studies are theories that model either the blockchain ecosystems (e.g., Cong and He 2019; Easley,

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[6] Our study also adds to the stream of research studying the benefits and costs of financial statement comparability (e.g., De Franco, Kothari, and Verdi 2011; Fang, Iselin, and Zhang 2021), indicating that, in the absence of a standard setter promoting comparable reporting, firms make idiosyncratic choices.

O'Hara, and Basu 2019; Cong, He, and Li 2021; Cong, Li, and Wang 2021) or crypto pricing mechanisms (e.g., Pagnotta and Buraschi 2018; Biais et al. 2020). The handful of empirical studies generally focus on examining trading properties of the crypto markets (e.g., Makarov and Schoar 2020; Augustin et al. 2021; Cong et al. 2021; Liu and Tsyvinski 2021). Although our particular interest is in crypto accounting, the methodology that we develop to collect such holdings could be instrumental in assisting future studies of how firms use crypto.

2. Background

2.1. An overview of the cryptocurrency market

Cryptocurrencies were born in the wake of the financial crisis. The Great Recession of 2007-2009 devastated the global economy and shook people's faith in banks, particularly their role in the financial systems. In October 2008, one month after Lehman Brothers filed for bankruptcy, a person or an organization going by the pseudonym Satoshi Nakamoto issued a white paper that introduced BTC as the world's first cryptocurrency (Nakamoto 2008). BTC significantly differs from fiat currencies in that it relies on cryptography for security and blockchain (a distributed ledger technology) for record keeping.[7] These features allow crypto to circumvent the centralized control of money as transactions are posted on a single ledger, visible to all, thus requiring no backing of any government or bank. After BTC and the idea of decentralized crypto began to gain traction, other crypto and tokens started emerging such as Litecoin (LTC) in 2011, Ripple (XRP) in 2012, Stellar (XLM) in 2014, and ETH in 2015.

For years, only niche groups participated in the 'mysterious' crypto market. Early participants were primarily drawn from three communities: the creators and original investors, true

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[7] In technical terms, a blockchain is a distributed, append-only ledger of provably signed, sequentially linked, and cryptographically secured transactions that is replicated across a network of computers. Updates are determined by a software-driven consensus mechanism, which is commonly referred to as "mining" in the BTC version of blockchain.

believers of decentralization (e.g., "cypherpunks"), and speculators. While not widespread, the crypto market did attract occasional institutional and corporate interest during its formative years. For example, in 2013, Digital Currency Group launched the Grayscale BTC Trust, the world's largest publicly traded BTC fund to date. In 2014, both Overstock and Microsoft (via its Xbox Store) forayed into the crypto space by accepting BTC as a form of payment. Despite such rare exceptions, mainstream investors mostly dismissed crypto assets as speculative tools that lack investment value.

Starting in 2020, a growing number of institutions and corporate investors began to allocate a percentage of their portfolios to crypto assets. A combination of factors likely contributes to the rising interest. First, the "medium of exchange" role of crypto has become more widely recognized and accepted in recent years, as businesses increasingly allow crypto as a mode of payment in both developed and emerging markets. In the U.S., an expanding list of major retailers (e.g., Home Depot, Starbucks, and Whole Foods) and small local business accept major cryptocurrencies as payment, often via third-party app providers. The online payment giant PayPal also launched a service in 2020 that allows its customers to use crypto with millions of merchants, and Google entered a partnership with Coinbase to accept crypto payments for its cloud services in October 2022. Compared with the U.S., many emerging markets exhibit even greater enthusiasm for crypto adoption, with Vietnam and India as frontrunners (Chainalysis 2021) and El Salvador going so far as to adopt BTC as the country's official currency.

Second, the "store of value" role of crypto has also been accentuated lately. In response to the COVID-19 pandemic, the Federal Reserve (or "Fed") took steps to support the economy by increasing money supply through reductions of the Fed Funds rate and purchases of Treasury and mortgage-backed securities. By comparison, many crypto assets have a fixed supply (e.g., BTC is

capped at 21 million). In addition, there is empirical evidence that the Fed's quantitative easing measures raised investors' risk appetite by driving them to seek higher returns from riskier investments like crypto assets (Dong, Fang, and Lin 2022). Consistent with this, surveys also highlight a rising institutional interest in crypto assets during the pandemic. A 2021 study by Fidelity Digital Assets found that more than half of the surveyed institutions reported already owning crypto assets and 70 percent expect to invest soon (Fidelity Digital Assets 2021). Another 2021 study by Nickel Digital Asset Management found that 82 percent of the surveyed institutions expect to invest in crypto assets in the next two years (Forbes 2021).

Although the Fed has raised interest rates and tightened liquidity in 2022, institutional interest in crypto remains strong. A 2022 study by Fidelity Digital Assets found that "despite market headwinds, adoption of digital assets among institutional investors surveyed increased in both the U.S. (42 percent) and Europe (67 percent), a respective 9-point and 11-point change year-over-year" (Fidelity Digital Assets 2022). For example, BlackRock, the world's largest asset management firm, launched a spot BTC trust for U.S. institutional investors, citing that "despite the steep downturn in the digital asset market, we are still seeing substantial interest from some institutional clients in how to efficiently and cost-effectively access these assets using our technology and product capabilities" (BlackRock 2022). In addition, Man Group, the world's largest publicly-traded hedge fund manager, also plans to launch a crypto fund, which signals continued investor appetite for crypto assets despite recent market turmoil (Bloomberg 2022).

2.2. Crypto-related federal regulation and accounting rule setting

Before 2017, regulators and standard setters across the globe generally saw no need or urgency to provide guidance on crypto assets given the market's narrow scope and the lack of mainstream interests. However, the increasing popularity of crypto has brought such assets to the

forefront of oversight agendas in many countries. In the U.S., the discussion centers around what asset class best fits crypto and thus, which agency has jurisdiction to oversee them (SEC 2021). The Treasury views crypto as either replacements of or threats to fiat currencies, the SEC considers most of them securities, and the Commodity Futures Trading Commission (CFTC) views leading cryptocurrencies as commodities, regulating their future contracts accordingly since 2017. The recent debate about the spot versus future BTC exchange-traded funds (ETFs) highlights the regulatory ambiguity over crypto: while the CFTC can continue to regulate BTC future contracts as derivatives for a future ETF, the SEC must take a clearer stance on whether BTC should be considered a security before they can approve and regulate it as a spot ETF (Roll Call 2021). Moreover, the recently introduced Digital Commodities Consumer Protection Act of 2022 (DCCPA) would grant the CFTC more direct control over the crypto industry if passed. To address these types of issues and bring in more regulatory clarity, President Joe Biden signed an executive order in March 2022 that directed federal agencies to coordinate their efforts to draft crypto regulations, and in September 2022, the White House released its first-ever regulatory framework for digital assets, paving the way for further policies.

Focusing on external reporting, U.S. GAAP currently offers no authoritative guidance or rules that specifically address the accounting or disclosure for investments in crypto. In fact, on three separate occasions the FASB rejected requests to set accounting rules for digital assets, citing that they are not pervasive enough to warrant explicit guidance (Bloomberg 2020).[8] In the absence of definitive rules, the Big 4 accounting firms and AICPA issued non-authoritative guidance between 2018 and 2019 suggesting that, under the current framework, crypto holdings best fit the

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[8] In contrast, the Internal Revenue Service (IRS) has been more vocal in categorizing crypto assets, claiming that they should be treated as property rather than currency for tax purposes (IRS 2014) and requiring taxpayers to report crypto assets acquired, exchanged, or sold on tax returns starting in 2019 (IRS 2019).

definition of indefinite-lived intangible assets following ASC 350, *Intangibles–Goodwill and Other*.[9] However, all parties acknowledged that the accounting treatment recommended by this guidance is not ideal. With the rise of corporate crypto holdings, the limitation of the prevailing accounting treatment has become increasingly evident. For example, MicroStrategy disclosed an impairment loss of $194.1 million on its $1.9 billion of BTC holdings in its 2021Q1 quarterly report. The firm also disclosed sufficient inputs to calculate a total fair value of $5.1 billion for these holdings, or 2.7 times the balance sheet value. In this case, the use of intangible asset accounting accompanied by fair value disclosures sends ambiguous signals to financial statement users, as the disclosure of an impairment loss seems to be at odds with significant market appreciation in the same period. The limitations of intangible asset accounting for crypto become even more salient when firms provide no fair value information.

In response to the growing chorus of voices calling for more formal crypto accounting rules, the FASB released an agenda consultation in 2021 to seek public opinions on accounting treatment for crypto assets, among other things. Although the feedback mostly favored a fair value accounting approach over a historical accounting approach, some commenters noted that the fair value basis for illiquid crypto assets can be difficult to determine, thus raising questions about the value of fair value accounting in those instances. For example, the AICPA Financial Reporting Executive Committee (FinREC) wrote "fair value should be required or optional when a *liquid* market [for a crypto asset] exists" (AICPA 2021, p. 3). The FASB reached a tentative decision in October 2022 to mandate the use of fair value accounting for measuring corporate crypto assets (WSJ 2022a), but also identified crypto accounting as one of the five topics in the initial

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[9] A few exceptions apply. For example, entities that qualify as investment companies under U.S. GAAP would account for their crypto holdings at fair value following ASC 946, *Financial Services–Investment Companies*, including the Grayscale crypto trust series.

deliberations stage on its recognition and measurement agenda as of November 2022 (FASB 2022b), suggesting that the debate is not over. The following analyses seek to provide information to inform this debate.

3. Data and sample

To construct a sample of firms with reported crypto holdings, we search financial statement footnotes within quarterly SEC filings pertaining to fiscal periods from 2008 to 2021. We identify firm-quarters that are most likely to have crypto holdings using a list of keywords we develop from reading a sample of filings.[10] Based on our initial review of the filings, we note that firms with reported crypto holdings disclose these holdings in at least one footnote, with many having a separate financial statement caption for their holdings and references in multiple disclosures. Therefore, we search financial statement footnotes, rather than the entire quarterly report, since it is unlikely that a firm would have a material crypto holding and not disclose it in its financial statements but in the remainder of its filing.[11] We examine the word hits and corresponding footnotes, systematically identifying filings with hits that occur in footnotes that we expect relate to crypto holdings. For example, we include filings with hits in footnotes such as "Fair value measurement," "Goodwill and intangible assets policy," and "Use of estimates," but exclude filings with hits only in footnotes such as "Commitments and contingencies," "Internal use software policy," and "Long-term debt," among others. While we expect a low probability of misclassification for the filings that we systematically exclude, we manually inspect 80 percent of

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[10] The search words used included BCH, Binance, Binance coin, Bitcoin, Bitcoin Cash, blockchain, BNB, BTC, crypto(s), crypto currency(ies), cryptocurrency(ies), decentralized finance, digital asset(s), digital currency(ies), digital security(ies), digital token(s), distributed ledger, distributed ledger technology(ies), Doge, Dogecoin, ETHE, ether, Ethereum, GBTC, Grayscale, Litecoin, LTC, NFT, non-fungible token(s), Ripple, stablecoin(s), Tether, USD Coin, USDC, USDT, virtual currency(ies), and XRP.

[11] Additionally, the scrutiny by regulators such as the SEC and Public Company Accounting Oversight Board (PCAOB) encourages auditors to verify that management's disclosures of crypto involvement are accurate (e.g., PCAOB 2020; SEC 2021; FASB 2021; AICPA 2019; CPAB 2019).

these excluded filings and identify no instances of improper exclusion. For the systematically included filings, we read the filing document to identify if these firms hold crypto and hand collect data related to crypto holdings from the financial statements, footnotes, and other disclosures within the filing.

Table 1 provides details of our sample selection. Our final sample consists of 438 firm-quarter observations for 98 distinct firms, covering fiscal quarters ended December 31, 2013 through December 31, 2021. Financial statement variables are compiled using Compustat when the firm was included in the database (53 percent of firm-quarter observations) and were hand-collected otherwise. Bitcoin liquidity information was compiled using CoinMarketCap.

Table 2 provides descriptive statistics for the firm-quarter observations in our sample. Approximately 34 percent of firm-quarter observations apply fair value accounting (*ACCTG_FV*). Of the 288 firm-quarters that apply intangible asset accounting, approximately 24 percent disclose the fair value amount (*DISCL_FV_AMT*) and 12 percent disclose inputs to determine fair value (*DISCL_FV_INPUTS*). Firm-quarters that apply intangible asset accounting disclose the trigger used to determine if impairment exists approximately 55 percent of the time (*DISCL_TRIG*), of which approximately 38 percent use the lowest price since acquisition (*TRIG_LOW*). In addition, approximately 45 percent of firm-quarter observations hold only BTC and/or ETH, representing the most liquid crypto assets (*CRYPTO_LIQ*), while the remaining 55 percent either have at least some portion of their holdings in an altcoin or did not disclose the type of crypto held (*CRYPTO_OTHER*). Approximately 40 percent of firm-quarters in our sample hold crypto due to mining activities (*OBJ_MINE*), with payment (*OBJ_PMT*) and investment (*OBJ_INV*) objectives representing approximately 30 and 21 percent of firm-quarter observations, respectively. The remaining nine percent of firm-quarter observations either hold crypto due to ICOs (*OBJ_ICO*) or

do not disclose the reasons for holding crypto (*OBJ_UNKNOWN*).

The mean (median) book value of crypto holdings is approximately $489 million ($304 thousand) (*CRYPTO_BV*), while the mean (median) inferred fair value is approximately $529 million ($346 thousand) (*CRYPTO_FV*). On average, crypto assets tend to be material as the inferred fair value (book value) is approximately 29 (21) percent of total assets (*PCT_FV*, *PCT_BV*). The income/loss from crypto holdings (in absolute terms) is also significant, with a mean of 76 percent of net income (*PCT_INC*), though the median values of these figures are much lower, reflecting some skewness in the distribution driven by firm-quarter observations such as the Grayscale Trusts, of which crypto is the entirety of their assets.

Although the crypto holdings captured by our sample are material, they represent a lower bound of true corporate crypto holdings for at least three reasons. First, Grayscale manages 17 crypto investment vehicles, and our sample includes only six of them from the time they were required to file with the SEC (i.e., filings for Bitcoin Trust since 2019, Ethereum Trust since 2020, and Digital Large Cap Fund, Bitcoin Cash Trust, Ethereum Classic Trust, and Litecoin Trust since 2021). Second, we are only able to include the quarter-end fair value of a firm's crypto holdings if one is given in the SEC filings or can be reasonably inferred based on disclosed information. Otherwise, we are constrained to use the quarter-end carrying value, which may be only a fraction of the fair value given the average rising crypto prices during our sample period. For example, we observe a decrease of $71.4 million in our sample's total inferred fair value from 2019Q3 to 2019Q4. This decrease is largely driven by the write-off of crypto holdings by Ideanomics, which changed the accounting policy for its crypto holdings from fair value to intangible asset accounting but provided no information to calculate the fair value. Third, our observations are limited to firms that explicitly disclose information about their crypto holdings in their SEC filings, which may

change with new disclosure rules. For example, PayPal allows its customers to buy, sell, and hold crypto through its platform, but is not included in our sample as they did not report any crypto holdings until 2022Q2, when the SEC issued the Staff Accounting Bulletin No. 121 (SAB 121) that requires registrants to recognize custodied digital assets both as assets and liabilities on their balance sheets.

4. Empirical analyses

4.1. Trends and patterns in corporate crypto holdings

The total value of reported crypto holdings has increased substantially across time, most notably in recent years. Panel A of Figure 1 illustrates this growth, showing a steep increase starting in 2019 that is largely driven by the Grayscale Trusts that entered our sample in 2019Q4. Even without considering the effects of the Grayscale Trusts, both the book value and fair value of reported crypto holdings in our sample increase dramatically in the last 2 years of the sample period.[12] To provide additional insight into the trends leading up to 2019Q3, Panel B of Figure 1 plots the book value and inferred fair value for our sample firms over time. Most notably, the book value and inferred fair value were relatively consistent for most of this period, with a large divergence beginning in mid-2016 and ending in 2017Q4. This gap spikes in 2017Q3 and is mostly driven by Fortress Investment Group, which reported holdings with a fair value of $103.4 million and book value of $5.7 million, applying intangible asset accounting to their crypto holdings. Fortress Investment Group went private after 2017Q3 and is not included in the sample after this date, explaining the convergence from that point forward.

Table 3 further explores the trends in crypto holdings by presenting the total value by

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[12] We define inferred fair value as the fair value of reported crypto holdings for firms that apply fair value accounting, the disclosed fair value for firms that apply intangible asset accounting but provide the fair value or inputs to determine fair value, or the book value for firms that apply intangible asset accounting and fair value information is not disclosed.

calendar quarter in our sample period. Column 1 details the aggregate fair value of holdings for the Grayscale Trusts, demonstrating a significant increase from $1.9 billion in 2019Q4 to $42.2 billion in 2021Q4. Columns 2 and 3 detail the book value and inferred fair value, respectively, of firms in our sample that exclude the Grayscale Trusts. Consistent with Figure 1, the book value and inferred fair value are relatively consistent for much of the period prior to 2019; however, the divergence in these two values begins to increase significantly, peaking at an inferred fair value that is on average 1.6 times that of the book value at 2021Q4. As discussed earlier, the decrease in the inferred fair value from 2019Q3 to 2019Q4 is driven by one firm switching to intangible asset accounting and providing no fair value information of its crypto holdings.

To better understand the driving forces of the growth in reported crypto holdings, we next plot underlying factors that contribute to the trend. Specifically, Figure 2 plots the inferred fair value, average crypto price as proxied by the price of BTC, inferred quantities held, and number of firms in our sample for each calendar quarter of the sample period.[13] While there has been a significant increase in crypto prices, particularly toward the end of the sample period, the quantities held and number of firms in our sample also explain a significant portion of the increasing trend. Based on an untabulated analysis of these determinants, we find that the increase in value of reported crypto holdings is driven by the increase in crypto prices, increase in quantities held, and increase in number of firms with holdings, in that order; these factors individually explain 92 percent, 88 percent, and 72 percent, respectively, of the increase in value.[14] Table 4 provides the

[13] We use the average BTC price to proxy for the overall crypto market because it represents approximately 40 percent of the overall global crypto market cap (on average) and is the predominant crypto held by firms in our sample, to the extent firms disclose which crypto they hold. Changes in prices of other cryptocurrencies such as ETH are highly correlated with changes in prices of BTC (ρ of 0.94 during our sample period), demonstrating that BTC prices are representative of the overall crypto market. For similar reasons, inferred quantities are determined using the inferred fair value and closing BTC price as of the last day of a firm's respective fiscal quarter.

[14] We repeat this analysis using the subsample of observations that apply fair value accounting or disclose fair value information and find similar results. For this subsample, crypto prices, quantities, and number of firms individually explain 92 percent, 88 percent, and 67 percent, respectively, of the increase in value.

details of these factors for each calendar quarter of our sample period. We find that these factors are highly, positively correlated with each other (ρ between 0.86 and 0.93), with the increase in crypto prices likely enticing firms to enter the crypto market and increase their holdings over time. In fact, even the shift in accounting methodology from fair value to intangible asset accounting in 2018 does not appear to detract from the demand for crypto holdings, as the number of firms in our sample almost triples from 19 in 2018Q3 to 54 in 2021Q4.

In terms of materiality, there is sizeable variation across firms (see Table 2 above) and over time. Figure 3 plots the median ratio of crypto holdings to assets and crypto income to total income, which provides insight into the variation of materiality of crypto holdings over time for firms in our sample. As shown, we find a rapid growth in the materiality of holdings, especially in the earlier part of the sample when holding firms tended to be mostly younger, smaller, and higher growth. This materiality decreases some in 2015 as more firms started accepting crypto as a form of payment and again in 2019 as larger, older, and more established firms enter the crypto market. However, materiality begins to grow again significantly in 2020, which largely coincides with the increase in crypto prices observed in Table 4.

Because crypto holdings are material to the firms in our sample, a natural question that follows is why these firms hold crypto. Figure 4 plots these objectives, based on firm discussions of their holdings in their quarterly reports. Despite not appearing until 2016, mining is the most commonly reported objective for firms to hold crypto (40 percent of sample), with a significant growth in this objective in 2018 that has continued through the remaining sample period. Non-mining firms predominantly report using crypto either in a payment capacity (30 percent of sample) or as an investment (21 percent). Retailers accepting crypto as a form of payment have done so directly (e.g., Overstock, PayPal, Microsoft) or through the utilization of crypto payment

processing applications such as Flexa (e.g., Home Depot, Whole Foods, Starbucks). The objectives for holding crypto have shifted over time, with the majority of firms in earlier years (approximately 65 percent before 2017) holding crypto to accept as a form of payment, while holding crypto as an investment increased in prominence in the later years of the sample period.

4.2. Crypto accounting and disclosure choices

We continue our analysis of corporate crypto holdings by examining the accounting and disclosure choices made by firms in our sample. We summarize the accounting policy choices in Figure 5, which shows that, for the first five years of our sample period, firms tended to account for crypto holdings at fair value, consistent with the accounting for cash, cash equivalents, and foreign currency. In the latter half of 2018, we observe a significant shift from fair value to intangible asset accounting, which coincides with interpretive guidance published by each of the Big 4 accounting firms that encourages accounting for crypto holdings as indefinite-lived intangible assets (Deloitte 2018, EY 2018, KPMG 2018, PwC 2018). There is a slight increase in the usage of fair value to account for crypto holdings in 2020, which is largely driven by firms holding such assets for the purposes of speculative investing. This includes the Grayscale Trusts, as well as firms accounting for crypto at fair value that do not qualify as investment companies under U.S. GAAP.

For more traditional intangible assets, which often do not have easily observed prices, the impairment test requires estimation of fair values by management and typically coincides with the end of each reporting period. However, because crypto such as BTC and ETH are actively traded every day, an observable fair value is available at essentially any point in the reporting period. This means that firms choosing to apply intangible asset accounting must determine the exact process used for testing their crypto holdings for impairment. One approach is for firms to use the

price at the reporting period-end as the trigger for impairment (i.e., a write-down is needed when the period-end price falls below the carrying value). A relatively more conservative interpretation of intangible asset accounting under U.S. GAAP suggests that a trade of the same crypto at a price below the carrying value *at any point during the period* is an indicator of impairment, regardless of whether the fair value subsequently increases. In the absence of an authoritative accounting standard that specifically applies to crypto holdings, influential bodies appear to suggest this conservative approach. For example, interpretive, non-authoritative guidance issued by the AICPA in December 2019 addresses this issue, stating that a trade of an identical crypto below the current carrying value "will often serve as an indicator that impairment is more likely than not" (AICPA 2019, p. 6). The guidance proceeds to suggest that impairment tests of crypto would be required if the carrying value exceeds the fair value at any point, and that an impairment loss should be recorded to write the crypto holdings down to its current fair value even if this occurs between report dates and the fair value subsequently increases by the end of the reporting period.

Table 5 provides additional detail on these accounting choices, shedding light on the impairment test choices related to accounting for crypto holdings as intangible assets. When the use of intangible asset accounting was relatively less common (i.e., through early 2018), the impairment trigger was universally disclosed. However, when firms shifted to this accounting method and away from fair value, we observe a significant decrease in the number of firms disclosing the impairment trigger that they use, with 48 percent of firms (on average) disclosing this information for the remainder of our sample period.[15] Of the firms that disclose the impairment trigger, the percentage using the lowest price since acquisition was zero until 2019Q1, increased to 50 percent a little more than one year later, and then 77 percent in 2021Q4.

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[15] Prior literature suggests that the opacity resulting from this lack of disclosure could create the opportunity for firms to manage earnings (e.g., Kirschenheiter and Melumad 2002; Jo and Kim 2007; Haggard, Howe, and Lynch 2015).

Firms using intangible accounting for crypto holdings also exercise considerable discretion in the amount of information they choose to disclose with respect to the fair value of their holdings. Figure 6 details trends in the voluntary disclosure of fair value information for our sample. In the first half of our sample period, voluntary disclosure of fair value information was relatively infrequent, mostly due to the lack of firms using intangible asset accounting. We observe an increase in firms disclosing either the fair value of their holdings or the inputs to determine fair value (i.e., price and/or quantity) to supplement the intangible asset disclosures within their quarterly report starting in 2019, which coincides with a period that saw significant increases in crypto prices. Table 6 provides additional details of this decision, specifically for firms that apply intangible asset accounting. For firms using intangible asset accounting at the beginning of our sample period, disclosure of the fair value of their holdings was relatively common. Very few firms prior to 2019 disclosed the inputs to determine fair value, with the majority of firms disclosing no fair value information from 2014 to 2016. The voluntary disclosure of fair value or inputs to determine fair value began to increase substantially in the second half of 2019, which coincides with the shift to using the lowest price since acquisition as the impairment trigger.

4.3. Fair value accounting versus intangible asset accounting: a liquidity perspective

As discussed earlier, there is currently no authoritative rule in U.S. GAAP that specifically addresses the accounting or disclosure requirements for corporate crypto holdings or other crypto assets. The Big 4 accounting firms and the AICPA recommend accounting for crypto assets as indefinite-lived intangible assets under ASC 350, *Intangibles–Goodwill and Other* (Deloitte 2018; EY 2018; KPMG 2018; PwC 2018; AICPA 2019). Collectively, this rationale largely stems from the difficulty of fitting crypto assets into a category of traditional assets (such as cash, cash equivalents, inventory, or financial instruments). In short, crypto assets are viewed more literally

and classified as intangible assets due to their lack of physical substance and maturity. However, absent any supplemental disclosure, analysts and investors generally find it difficult to evaluate firms with material crypto holdings because reported values for these assets on balance sheets tend to significantly deviate from their fair values (Bloomberg 2021).

Due to investor concerns and the growing crypto holdings by U.S. corporations, the FASB released an agenda consultation in June 2021 that made a request for public input on digital asset accounting. In response, businesses, accountants, investors, and the crypto community submitted dozens of comment letters. As discussed in Section 2.2, a common view that emerged from these letters is the advocacy for fair value accounting as opposed to intangible asset accounting. While crypto accounting remains a primary topic in the initial deliberations stage on the FASB agenda, the Board reached a tentative decision in October 2022 that would require firms to use fair value accounting to account for their crypto holdings (WSJ 2022a). However, the choice between fair value accounting and intangible asset accounting remains at the crux of the policy debate as this guidance is not finalized and could create significant challenges for firms holding illiquid crypto assets. The AICPA's FinREC group recognized this issue in their comment letter by incorporating liquidity of the crypto market in their recommended accounting frameworks, indicating that "fair value should be required or optional when a liquid market exists" (AICPA 2021, p. 3). This recommendation is consistent with a central prediction from theory that fair value accounting is more useful than historical cost accounting when the assets of interest are more liquid (Plantin, Sapra, and Shin 2008; Allen and Carletti 2008). In this section, we link the two relevant fair value accounting decisions—the choice of accounting policy and the extent of voluntary fair value disclosures—to the liquidity of crypto markets to understand whether firms are attempting to increase the value relevance of their reported crypto holdings.

Starting with the accounting policy decision, we define an indicator variable, *ACCTG_FV*, that equals one if the firm applies a fair value accounting approach to account for its crypto holdings during a given quarter, and zero otherwise. We compute three proxies to capture the liquidity of the firm's crypto holdings, all based on the market for BTC: the quarterly average of daily BTC trading volume (*TOT_VOL*), the quarterly average of daily BTC trading volume scaled by daily BTC market capitalization (*VOL_MKT*), and the quarterly average of daily absolute return-to-trading volume in the BTC market similar to the Amihud (2002) illiquidity measure (*AMIHUD*).[16] Building on the insights from the market microstructure literature (e.g., Kyle 1985; Fang, Noe, and Tice 2009; Goyenko, Holden, and Trzcinka 2009), the first two volume-based measures should be positively related to liquidity, as higher trading volume typically implies a lower market "tightness" (and thus a lower trading cost). The third measure should be negatively related to liquidity as a higher price impact typically implies lower market depth (and thus a lower ability to absorb large market orders without significantly moving the price). All three liquidity measures focus on trading properties of the BTC market because we are unable to create firm-quarter specific liquidity measures due to the lack of disclosure detail. However, most of the firms with reported crypto assets in our sample hold BTC and, even when they hold ETH or other crypto, the liquidity across the main crypto markets tends to be highly positively correlated (e.g., our liquidity measures, when calculated using ETH, are correlated with the BTC measures at rates ranging from 0.86 to 0.97).

We then split our sample observations based on whether the quarter (*q*) falls in the pre-guidance period (i.e., prior to 2018Q3 when the Big 4 accounting firms and AICPA began issuing

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[16] Bitcoin liquidity information is available starting in 2014Q1. Accordingly, the two firm-quarter observations in 2013Q4 are excluded from the liquidity analyses in this section, resulting in a sample of 436 firm-quarter observations used in the multiple regression analyses.

guidance recommending intangible asset accounting for corporate crypto holdings) ($POST = 0$) or the post-guidance period (i.e., during or after 2018Q3) ($POST = 1$) and estimate the following linear probability model (LPM) on each subsample:[17]

$$ACCTG\_FV_{i,q} = \alpha + \beta_1 LIQ_q + \beta_x CONTROL_{i,q} + \varepsilon_{i,q} \tag{1}$$

The dependent variable, *ACCTG_FV*, captures firm *i*'s choice of accounting policy for its crypto holdings in quarter *q* and *LIQ* is one of the three liquidity measures calculated for quarter *q*, all defined above. *CONTROLS* include the average return for BTC during quarter *q* (*RET_AVG_BTC*), two controls for the materiality of firm *i*'s crypto holdings during quarter *q*, including *PCT_FV* (the ratio of inferred fair value-to-total assets) and *PCT_INC* (the ratio of crypto income-to-net income), and four basic financial controls for firm *i* measured at the end of quarter *q* including *LN_MKT* (the natural logarithm of the firm's market capitalization), *MTB* (the market-to-book ratio), *LEV* (book leverage), and *ROA* (return-on-assets ratio).

Table 7 presents the results from estimating equation (1). Given that firms were allowed significantly more discretion in the pre-guidance period, our primary coefficient of interest is β_1, which captures the relation between crypto market liquidity and firms' crypto accounting policy choices, in Columns (1), (4), and (7). As shown, the coefficient estimates on the two liquidity measures (*TOT_VOL* and *VOL_MKT*) are positive and significant ($p < 0.01$) and the coefficient estimate on the illiquidity measure (*AMIHUD*) is negative and significant ($p < 0.05$), which suggests a positive effect of liquidity on the firm's propensity to adopt fair value accounting in the pre-guidance period. Consistent with guidance toward intangible asset accounting limiting these effects, two of the three tests of the differences in coefficient estimates between the pre- and post-guidance periods (Columns (3), (6), and (9)) indicate a statistically significant change in this

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[17] We use an LPM in each of our models to simplify interpretation of coefficients. Our inferences throughout are similar if we instead use a probit model.

relation after the guidance was released. This result suggests that the guidance issued by the Big 4 accounting firms and AICPA weakened the positive effect of liquidity of on the adoption rate of fair value accounting. These results suggest that when firms are left unguided and thus have discretion over the choice of accounting policy, they are more likely to adopt fair value accounting when the liquidity of crypto assets is higher, and the price impact is lower, consistent with theory that fair value accounting is more useful than historical cost accounting when the assets of interest are more liquid.

Turning to the voluntary fair value disclosure decision, we define an indicator variable, *DISCL_FV*, that equals one if the firm voluntarily discloses at least some level of fair value information, and zero otherwise. Since this decision is only relevant for firms that apply the intangible asset accounting to their crypto holdings, we restrict this analysis to firm-quarters that use intangible asset accounting. We then modify equation (1) to include *DISCL_FV* as the dependent variable:

$$DISCL\_FV_{i,q} = \alpha + \beta_1 LIQ_q + \beta_x CONTROL_{i,q} + \varepsilon_{i,q} \tag{2}$$

As described above, *DISCL_FV*, captures firm *i*'s extent of fair value disclosure for its crypto holdings in quarter *q*. *LIQ*, which takes the value of one of the three liquidity measures calculated for quarter *q* and *CONTROL* are as previously defined. Consistent with our prior analysis, we again split our sample observations based on whether quarter *q* falls in the pre-guidance period (*POST* = 0) or the post-guidance period (*POST* = 1).[18]

Table 8 presents the results from estimating equation (2). Because we are interested in whether firms that account for their crypto holdings as intangible asset choose to also disclose fair

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[18] We divide the sample into the pre- and post-guidance period to focus on the effects of the 2018 "shock," which is expected to significantly alter firms' crypto-related accounting and disclosure decisions. We do not include time fixed effects in either model for the sub-periods because these decisions are otherwise relatively sticky within a short period.

value-related details, we are primary interested in the effects observed in the post-guidance period (i.e., Columns (2), (5), and (8)). That is, the pre-guidance observations are instances where a firm was generally free to choose fair value reporting if they desired to share that information. Our primary coefficient of interest in these tests is β_1, which captures the relation between crypto market liquidity and firms' fair value disclosure choices. The coefficient estimates on the liquidity term in Column (2) (*TOT_VOL*) is positive and significant ($p < 0.01$), and the coefficient estimate on the illiquidity measure in column (8) (*AMIHUD*) is negative and significant ($p < 0.01$). We do not observe a significant effect in Column (5) using the *VOL_MKT* measure. Consistent with guidance toward intangible asset accounting being the driver of these effects, tests of the differences in coefficient estimates between the pre- and post-guidance periods (Columns (3), (6), and (9)) all indicate a statistically significant change in this relation after the guidance was released ($p < 0.01$ for each). Together, these results provide evidence of a positive effect of liquidity on the firm's propensity to make fair value disclosures about its crypto holdings in the post-guidance period. That is, firms, when guided toward adopting the intangible asset accounting as the accounting policy, are still more likely to provide fair value information about their crypto holdings when the reporting period liquidity of crypto markets is higher, and the price impact is lower.

In summary, results in this section are consistent with the central prediction from fair value accounting theory (Plantin, Sapra, and Shin 2008; Allen and Carletti 2008) and observations by practitioners (e.g., AICPA 2021) that liquidity is a determining factor in a firms' choice to apply fair value accounting and disclose fair value information. In the setting of crypto assets, we find that when firms are left unguided and thus have discretion over the choice of accounting policy, they are more likely to adopt fair value accounting when the liquidity of crypto assets is higher, but when the discretion over accounting policy is limited by guidance, firms resort to making more

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fair value disclosures when liquidity of crypto assets is higher.

5. Conclusion

The global crypto market has grown substantially in the last decade. A 2021 report released by Deloitte notes that "more operating companies began allocating cash to digital assets and cryptocurrencies," which represents "a new dynamic and a departure from more conventional investing by funds and others in this space" (Deloitte 2021, p. 4). As the report points out, the reasons for corporate crypto holdings are multi-faceted: while some firms may accept crypto payments merely as ways to increase revenue or embrace modern, open technologies, others are proactive about investing in crypto assets either to seek returns or hedge. Despite industry reports, survey evidence, and anecdotes suggesting that corporate crypto holdings are on the rise, little is known about either the landscape of these assets or how firms account for such assets, particularly given the lack of disclosure requirements and authoritative accounting rules.

This paper is among the first to systematically study corporate crypto holdings. We first compile a sample of U.S. public reporting entities with reported crypto holdings by searching for crypto-related keywords in the periodic financial reports. We then study the trends and patterns of corporate crypto holdings, document the status quo of crypto accounting, and explore the rationale behind firms' choice of accounting policy and extent of fair value disclosures.

Our paper yields three important findings. First, our analyses show that corporate holdings of crypto assets are clearly rising in the US, from $16.4 million in 2013Q4 to $54.3 billion in 2021Q4. This trend is jointly driven by an average increase in crypto price, a higher average quantity held by each firm, and a greater number of firms holding crypto assets. Second, our analyses suggest significant managerial discretion in accounting for crypto holdings. We observe a switch from fair value accounting to intangible asset accounting beginning in 2018, presumably

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following the interpretive guidance suggested by the Big 4 accounting firms and AICPA. However, even for firms that apply intangible asset accounting, we observe significant variations in the assumptions used in the impairment tests (e.g., the use of interim period-end price or the lowest price since acquisition as the impairment trigger) and variations in the extent of supplemental fair value disclosures (e.g., a single point estimate or price/quantity inputs). Third, our evidence suggests that firms are more likely to apply fair value accounting to crypto holdings when the reporting period liquidity of crypto markets is higher and price impact is lower, but only prior to the release of guidance from the Big 4 and AICPA. In the post-guidance period, we find that firms applying intangible asset accounting are more likely to make voluntary fair value disclosures when the liquidity of cryptocurrency markets is higher and price impact is lower.

These results carry important implications for accounting standard setters. In the past, the FASB has maintained the position that public entities' holdings of crypto are not pervasive or material enough to warrant standard-setting actions (Bloomberg 2020). As a result, no authoritative guidance currently exists to address crypto accounting or disclosure. Our estimates, which reflect a lower bound given the current reporting practices, indicate a trajectory of exponential growth in corporate crypto holdings that echoes the industry's initiative to push for authoritative accounting rules (Bloomberg 2021). The significant variations in firms' crypto accounting choices should also raise regulatory awareness. Although it is difficult to ascertain the reporting motive behind a specific choice, the lack of comparability and consistency in crypto accounting, particularly in the extent and salience of fair value disclosures, make it difficult to extract and compare such information for investors and other stakeholders.

Most importantly, our results suggest that liquidity is an important consideration in the choice of fair value accounting versus historical accounting in the crypto setting. In October 2022,

the Board reached a tentative decision that would mandate fair value accounting instead of intangible asset accounting for the measurement of crypto assets (WSJ 2022a). This is a highly anticipated decision that seeks to provide clarity on how U.S. public entities should account for their crypto holdings. However, given the decentralized nature of crypto assets, whether an asset's fair value basis is readily available critically depends on its liquidity. We find that firms, when left unguided, are more likely to adopt fair value accounting and provide fair value disclosures when crypto markets are more liquid during a period. This result supports fair value accounting theory (Plantin, Sapra, and Shin 2008; Allen and Carletti 2008) and industry observations that the application of fair value accounting to crypto assets may only be practical when liquid markets exist (e.g., AICPA 2021). For this reason, it highlights the benefits of considering a modified fair value accounting approach that incorporates the liquidity of crypto assets in future authoritative guidance. Since liquidity varies considerably across crypto assets, incorporating it into the accounting guidance could help firms better determine the value basis for their crypto holdings and avoid going from one extreme to another.[19]

Our paper also identifies several avenues for future research. Future research may study whether certain crypto accounting and disclosure choices (e.g., the choice of impairment trigger price or location of disclosure) are made for informative or opportunistic reporting motives. Another possible direction is to study how market participants consume the supplemental fair value disclosures of crypto assets in financial statements and the extent to which different levels of disclosures affects pricing. More research is certainly warranted in this exciting new market.

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[19] In a similar vein, banks apply fair value accounting to all assets but stratify their assets into three different levels based on liquidity. Specifically, level 1 includes the most liquid assets, which are valued according to the readily observable market prices; level 2 includes the second-most liquid assets, which are valued using observable prices for similar assets; level 3 includes the least liquid assets, which are valued using models and unobservable inputs.

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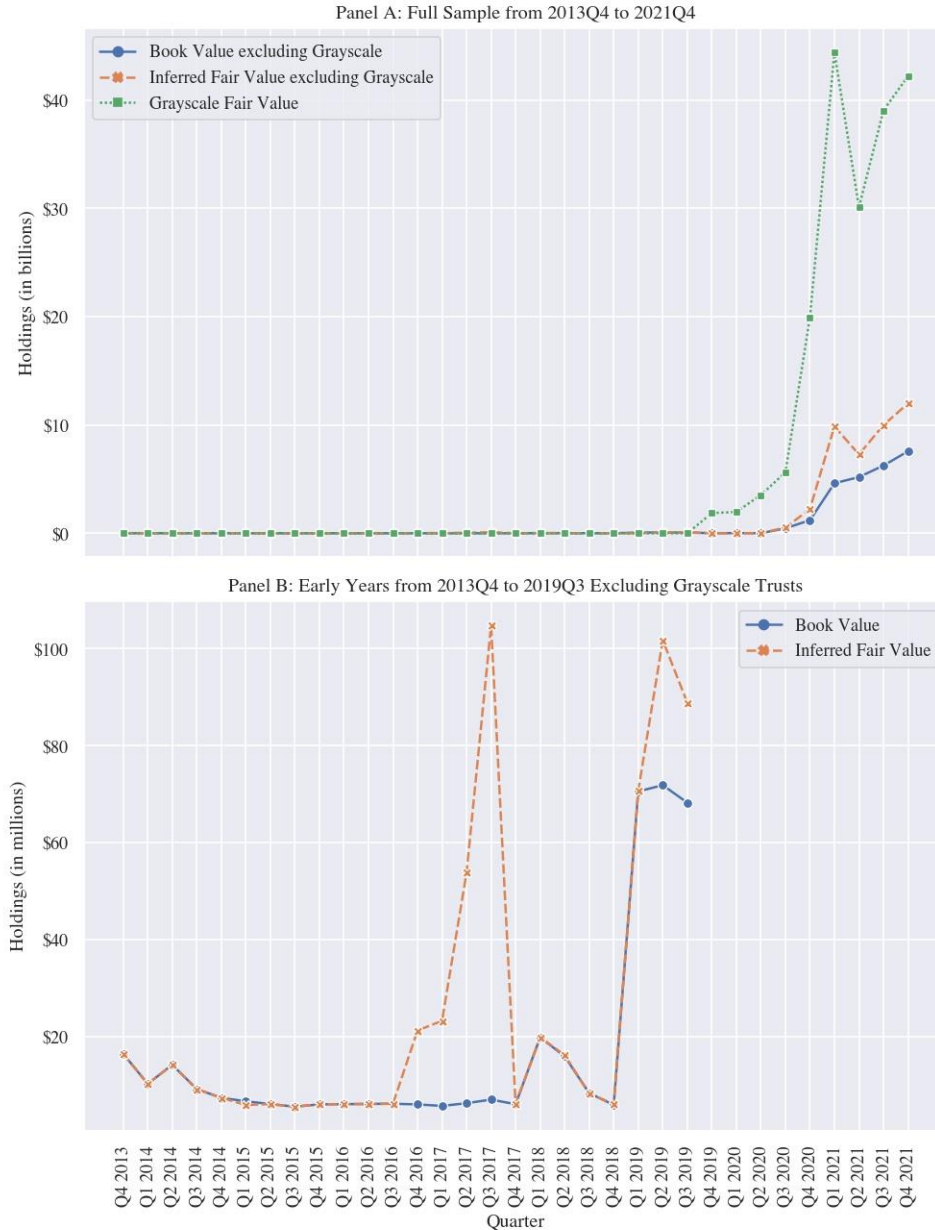
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Appendix: Variable Definitions

Variable	Definition
ACCTG_FV	Indicator variable set equal to one if the crypto holdings for firm i and quarter j are accounted for at fair value, and zero otherwise.
AMIHUD	Quarterly average of Bitcoin illiquidity following Amihud (2002) for quarter j, calculated on a daily basis as the closing price return of Bitcoin, divided by the total volume of Bitcoin transactions for the respective day (scaled by $1 billion).
CRYPTO_BV	Book value of crypto holdings for firm i and quarter j, stated in millions of dollars.
CRYPTO_LIQ	Indicator variable set equal to one if firm i holds only Bitcoin and/or Ethereum at the end of quarter j, and zero otherwise.
CRYPTO_OTHER	Indicator variable set equal to one if firm i holds any crypto other than Bitcoin and/or Ethereum (i.e., altcoins) or does not disclose the crypto held at the end of quarter j, and zero otherwise.
DISCL_FV	Indicator variable set equal to one if crypto holdings for firm i and quarter j are accounted as an intangible asset and either the fair value is disclosed or the inputs to calculate fair value are disclosed, and zero otherwise. Variable is constructed for only firm-quarters where intangible asset accounting is used.
DISCL_FV_AMT	Indicator variable set equal to one if crypto holdings for firm i and quarter j are accounted as an intangible asset and the fair value is disclosed, and zero otherwise. Variable is constructed for only firm-quarters where intangible asset accounting is used.
DISCL_FV_INPUTS	Indicator variable set equal to one if crypto holdings for firm i and quarter j are accounted as an intangible asset and the inputs to calculate fair value are disclosed, and zero otherwise. Variable is constructed for only firm-quarters where intangible asset accounting is used.
DISCL_TRIG	Indicator variable set equal to one if crypto holdings for firm i and quarter j are accounted as an intangible asset and trigger used to assess for impairment is disclosed, and zero otherwise. Variable is constructed for only firm-quarters where intangible asset accounting is used.
INF_FV	Inferred fair value of crypto holdings for firm i and quarter j, stated in millions of dollars. The inferred fair value equals the reported fair value of crypto holdings if fair value accounting were applied, the disclosed fair value if intangible asset accounting were applied but the amount or reasonable inputs were also provided to determine the fair value, or the book value if intangible asset accounting were applied and no inputs were provided to determine the fair value.
INF_QUANT	Inferred quantity of crypto holdings for firm i and quarter j. The inferred quantity held for each firm-quarter is determined using the inferred fair value and the closing BTC price as of the last day of the firm's given fiscal quarter.
LEV	Sum of long-term debt and debt in current liabilities scaled by total assets for firm i and quarter j.

Variable	Definition
LN_MKT	Natural log of the market value of equity as of the financial statement date for firm *i* and quarter *j*.
MTB	Ratio of market value of equity to book value of equity for firm *i* and quarter *j*.
OBJ_ICO	Indicator variable set equal to one if the crypto holdings for firm *i* and quarter *j* are held for ICO purposes, and zero otherwise.
OBJ_INV	Indicator variable set equal to one if the crypto holdings for firm *i* and quarter *j* are held for investment purposes, and zero otherwise.
OBJ_MINE	Indicator variable set equal to one if the crypto holdings for firm *i* and quarter *j* are held for mining purposes, and zero otherwise.
OBJ_PMT	Indicator variable set equal to one if the crypto holdings for firm *i* and quarter *j* are held for payment purposes, and zero otherwise.
OBJ_UNKNOWN	Indicator variable set equal to one if the crypto holdings for firm *i* and quarter *j* are held for unknown purposes, and zero otherwise.
PCT_BV	Ratio of the book value of crypto holdings as of the financial statement date to total assets for firm *i* and quarter *j*.
PCT_FV	Ratio of the fair value of crypto holdings as of the financial statement date (if carried at fair value, fair value is disclosed, or the inputs to calculate fair value are disclosed) or the book value of crypto holdings as of the financial statement date to total assets for firm *i* and quarter *j*.
PCT_INC	Ratio of the sum of the absolute value of income and loss from crypto to the absolute value of net income or loss for firm *i* and quarter *j*.
POST	Indicator variable set equal to one if the quarter *j* occurs on or after the third calendar quarter of 2018, and zero otherwise.
RET_AVG_BTC	Quarterly average of Bitcoin returns for quarter *j*, calculated on a daily basis using the closing price return of Bitcoin.
ROA	Net income scaled by average total assets for firm *i* and quarter *j*.
TOT_VOL	Quarterly average of Bitcoin trading volume for quarter *j*, calculated on a daily basis (scaled by $1 billion).
TRIG_LOW	Indicator variable set equal to one if crypto holdings for firm *i* and quarter *j* are accounted as an intangible asset and the lowest price since acquisition is disclosed as the trigger used to assess for impairment, and zero otherwise. Variable is constructed for only firm-quarters where intangible asset accounting is applied and the impairment trigger used is disclosed.
VOL_MKT	Quarterly average of the volume to market capitalization ratio for Bitcoin and quarter *j*, calculated on a daily basis as the total Bitcoin trading volume divided by the ending market capitalization.

Figure 1: The Trend of Corporate Cryptocurrency (Crypto) Holdings

Panel A: Full Sample from 2013Q4 to 2021Q4

Panel B: Early Years from 2013Q4 to 2019Q3 Excluding Grayscale Trusts

Panel A plots the fair value of crypto holdings held by the Grayscale Trusts (the dotted line), the book value of crypto holdings held by firms excluding the Grayscale Trusts (the solid line), and the inferred fair value of crypto holdings held by firms excluding the Grayscale Trusts (the dashed line), by calendar quarter for the full sample period from 2013Q4 to 2021Q4. In constructing the sample, a firm's fiscal quarter is aligned to the calendar quarter in which the fiscal period ends. Panel B zooms in on the early years from 2013Q4 to 2019Q3 and reports only the book value (the solid line) and inferred fair value (the dashed line) of crypto holdings held by firms excluding the Grayscale Trusts. For each firm-quarter in the solid line, the book value (*CRYPTO_BV*) equals the carrying value of crypto holdings. For each firm-quarter in the dashed line, the inferred fair value (*INF_FV*) equals either the reported fair value of crypto holdings if fair value accounting were applied, the disclosed fair value if intangible asset accounting were applied but the amount or reasonable inputs were also provided to determine the fair value, or the book value if intangible asset accounting were applied and no inputs were provided to determine the fair value.

Figure 2: Decomposing the Trend of Corporate Crypto Holdings

This figure plots the inferred fair value (*INF_FV*) of crypto as of the end of the fiscal period, average closing price of Bitcoin (BTC) by calendar quarter, the inferred quantities (*INF_QUANT*) of crypto held by these firms, and the number of firms that report holding crypto by calendar quarter. The inferred quantity held for each firm-quarter is determined using the inferred fair value and the closing BTC price as of the last day of the firm's given fiscal quarter. A firm's fiscal quarter is aligned to the calendar quarter in which the fiscal period ends. Each variable has been standardized for ease of viewing.

Figure 3: Materiality of Crypto Holdings

This figure reports information on the materiality of crypto holdings for firms in our sample, based on the median across all firms in our sample during the respective calendar year. This information includes the ratio of the inferred fair value (*PCT_FV*) and book value (*PCT_BV*) of crypto holdings to total assets as of the financial statement date, as well as the ratio of the sum of the absolute value of income or loss from crypto to the absolute value of net income (*PCT_INC*). The sample used in this figure includes firms with reported crypto holdings and spans from 2013Q4 to 2021Q4; all firm-quarters are aggregated based on the year in which the fiscal period ends.

Figure 4: Objectives of Crypto Holdings
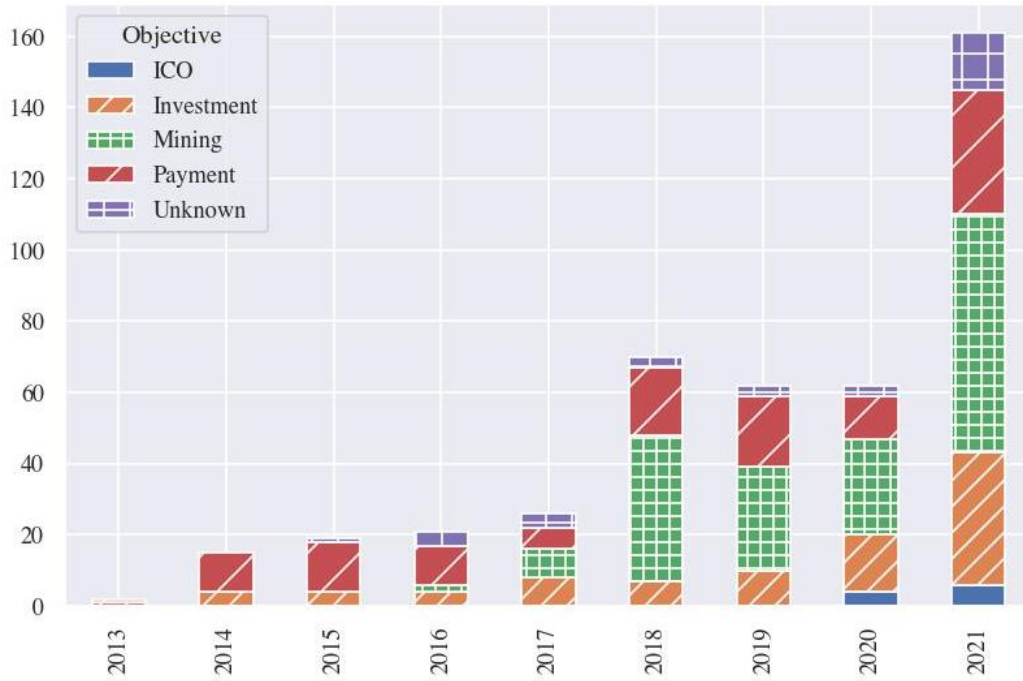
This figure reports the objectives of holding crypto, as disclosed by firms in our sample and aggregated by calendar year. The sample used in this figure includes firms with reported crypto holdings and spans from 2013Q4 to 2021Q4; all firm-quarters are aggregated based on the year in which the fiscal period ends.

Figure 5: Accounting Policy Choice (Fair Value versus Intangible Asset)
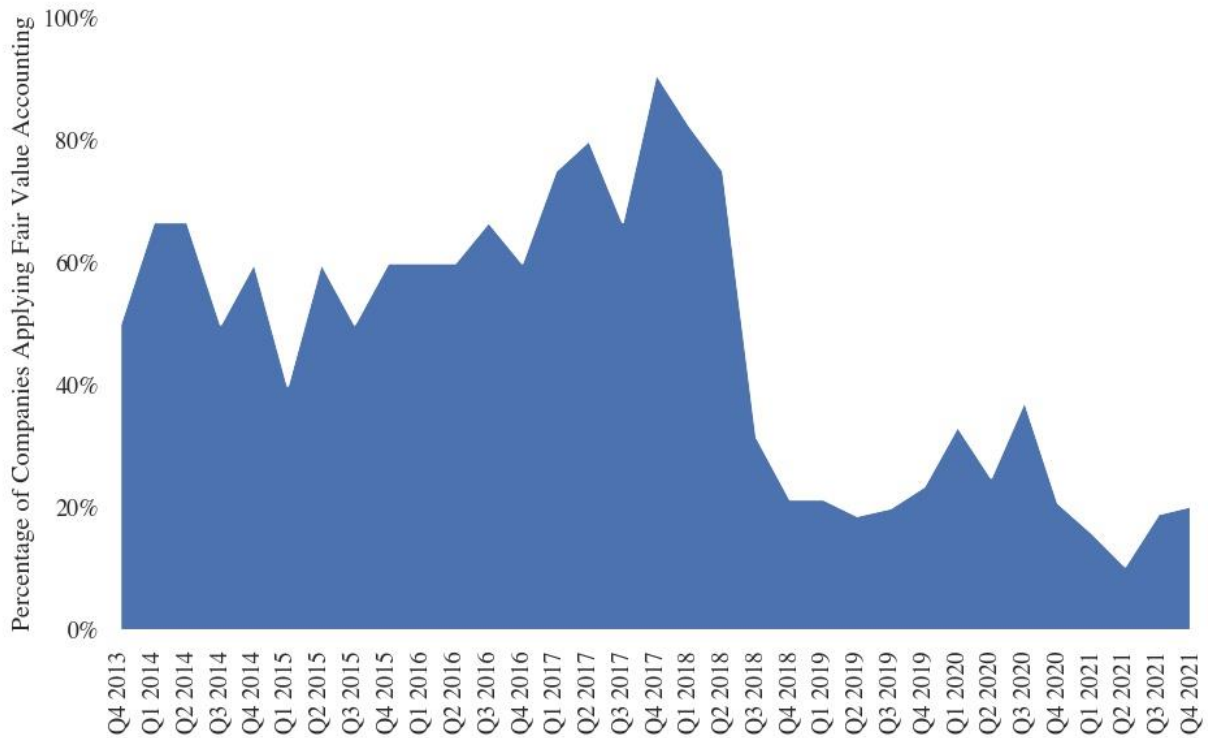
This figure plots the percentage of firms applying the fair value accounting to crypto holdings (*ACCTG_FV=1*) by calendar quarter. The sample used in this figure includes firms with reported crypto holdings and spans from 2013Q4 to 2021Q4; a firm's fiscal quarter is aligned to the calendar quarter in which the fiscal period ends.

Figure 6: Fair Value Disclosure Choice
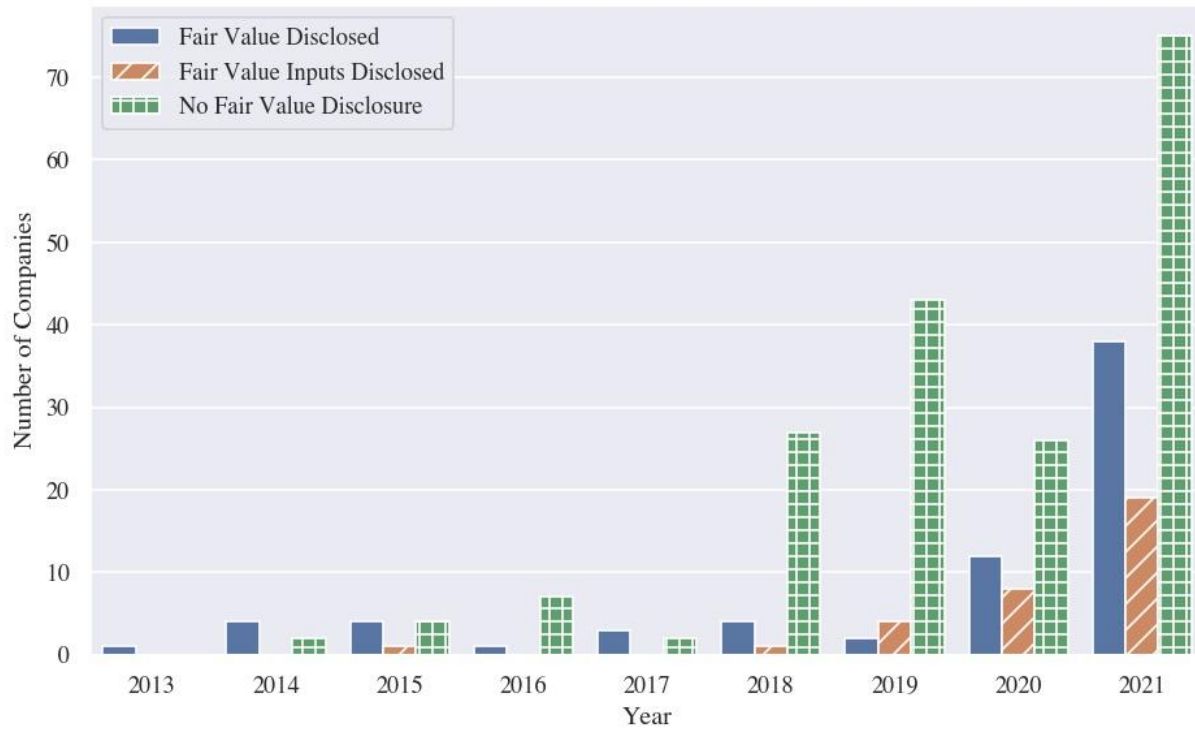
This figure reports the fair value information disclosure choices, aggregated by calendar year. The sample used in this figure includes only firms that apply the intangible asset accounting to crypto holdings and spans from 2013 to 2021; all firm-quarters are aggregated based on the year in which the fiscal period ends.

Table 1: Sample Selection

Panel A: Sample selection

	Firms	Firm-Quarters
Initial search results	670	5,580
Less:		
Systematically excluded results	(431)	(4,250)
Systematically included, with no crypto holdings	(141)	(892)
Total observations with crypto holdings used in descriptive analyses	98	438
Less:		
Crypto liquidity information unavailable	-	(2)
Total observations used in multiple regression analyses	98	436

Panel B: Summary of source data

Financial statement variables	Firm-Quarters	Percentage
Compustat	230	53%
Hand-collected	208	47%
Total	438	100%

This table summarizes the sample selection procedures. Initial search results detail the number of firms and filings that were initial hits using a "bag of words" approach. Systematically excluded results denote those search results that were excluded from the sample as the nature of the word hit had a low likelihood of relating to reported crypto holdings and had a low expected probability of misclassification. Systematically included, with no crypto holdings denote those search results that had a higher likelihood of relating to reported crypto holdings and based upon our reading of the corresponding filing, the firm did not report any crypto holdings. Figures 1 through 6 and Tables 1 through 6 contain descriptive analyses, which includes 438 firm-quarter observations. Two firm-quarter observations are excluded from the sample used for the multiple regressions presented in Tables 7 and 8 as crypto liquidity information is unavailable for the respective fiscal quarter.

Table 2: Descriptive Statistics

VARIABLES	N	Mean	Std. Dev.	p(25)	Median	p(75)
ACCTG_FV	438	0.342	0.475	0.000	0.000	1.000
AMIHUD	436	0.074	0.230	0.001	0.001	0.005
CRYPTO_BV	438	489.307	3119.276	0.030	0.304	5.653
CRYPTO_LIQ	438	0.454	0.498	0.000	0.000	1.000
CRYPTO_OTHER	438	0.546	0.498	0.000	1.000	1.000
DISCL_FV	288	0.354	0.479	0.000	0.000	1.000
DISCL_FV_AMT	288	0.240	0.428	0.000	0.000	0.000
DISCL_FV_INPUTS	288	0.115	0.319	0.000	0.000	0.000
DISCL_TRIG	288	0.545	0.499	0.000	1.000	1.000
INF_FV	438	528.939	3147.217	0.030	0.346	6.200
INF_QUANT	438	16000.000	78000.000	4.275	46.664	613.639
LEV	438	4.392	46.071	0.001	0.091	0.349
LN_MKT	438	17.593	5.323	16.260	18.258	20.568
MTB	438	6498.181	140000.000	0.000	1.927	8.108
OBJ_ICO	438	0.023	0.150	0.000	0.000	0.000
OBJ_INV	438	0.208	0.406	0.000	0.000	0.000
OBJ_MINE	438	0.397	0.490	0.000	0.000	1.000
OBJ_PMT	438	0.295	0.456	0.000	0.000	1.000
OBJ_UNKNOWN	438	0.078	0.268	0.000	0.000	0.000
PCT_BV	438	0.206	0.326	0.003	0.025	0.254
PCT_FV	438	0.293	0.903	0.004	0.028	0.264
PCT_INC	438	0.756	4.501	0.000	0.014	0.225
POST	438	0.726	0.447	0.000	1.000	1.000
RET_AVG_BTC	438	0.002	0.005	-0.001	0.001	0.005
ROA	438	-4.288	38.711	-0.511	-0.132	0.002
TOT_VOL	436	24.588	19.929	5.762	25.430	34.292
TRIG_LOW	157	0.376	0.486	0.000	0.000	1.000
VOL_MKT	436	0.071	0.057	0.033	0.051	0.107

This table presents descriptive statistics for the full sample of observations. Figures 1 through 6 and Tables 1 through 6 contain descriptive analyses, which includes 438 firm-quarter observations. Two firm-quarter observations are excluded from the sample used for the multiple regressions presented in Tables 7 and 8 as crypto liquidity information is unavailable for the respective fiscal quarter.

Table 3: Total Value of Corporate Crypto Holdings by Quarter

Quarter	(1) Holdings by Grayscale Trusts (*INF_FV*)	(2) Corporate Holdings Excluding Grayscale Trusts (*CRYPTO_BV*)	(3) Corporate Holdings Excluding Grayscale Trusts (*INF_FV*)
2013 Q4	-	16,443,000	16,443,000
2014 Q1	-	10,255,089	10,255,089
2014 Q2	-	14,167,943	14,167,943
2014 Q3	-	9,163,089	9,163,089
2014 Q4	-	7,363,534	7,363,534
2015 Q1	-	6,653,864	5,893,771
2015 Q2	-	6,069,235	6,069,235
2015 Q3	-	5,543,414	5,543,414
2015 Q4	-	6,016,002	6,016,002
2016 Q1	-	6,065,456	6,065,456
2016 Q2	-	6,103,262	6,103,262
2016 Q3	-	6,144,444	6,144,444
2016 Q4	-	6,011,390	21,258,390
2017 Q1	-	5,690,378	23,237,378
2017 Q2	-	6,263,214	53,810,214
2017 Q3	-	7,003,281	104,750,281
2017 Q4	-	6,054,505	6,054,505
2018 Q1	-	19,835,766	19,836,119
2018 Q2	-	15,926,217	16,176,224
2018 Q3	-	8,333,187	8,254,905
2018 Q4	-	5,909,677	6,076,785
2019 Q1	-	70,563,137	70,643,027
2019 Q2	-	71,845,059	101,743,594
2019 Q3	-	68,245,600	88,860,994
2019 Q4	1,866,217,842	15,455,797	17,468,856
2020 Q1	1,972,244,030	16,051,978	16,610,813
2020 Q2	3,532,364,439	10,381,944	13,005,194
2020 Q3	5,620,572,536	462,191,474	534,876,253
2020 Q4	19,904,604,546	1,206,633,046	2,325,095,439
2021 Q1	44,390,469,000	4,618,601,270	9,889,623,275
2021 Q2	30,088,751,000	5,189,878,636	7,393,885,047
2021 Q3	39,023,468,000	6,249,963,845	10,127,172,830
2021 Q4	42,190,096,000	7,566,965,555	12,149,027,325

This table corresponds to Figure 1 and reports the fair value of crypto holdings (*INF_FV*) held by the Grayscale Trusts (column 1), the book value of crypto holdings (*CRYPTO_BV*) held by firms excluding the Grayscale Trusts (column 2), and the inferred fair value of crypto holdings (*INF_FV*) held by firms excluding the Grayscale Trusts (column 3), by calendar quarter for the full sample. The sample period spans from 2013Q4 to 2021Q4; firm's fiscal quarter is aligned to the calendar quarter in which the fiscal period ends. For each firm-quarter in column 2, the book value equals the carrying value of crypto holdings. For each firm-quarter in column 3, the inferred fair value equals either the reported fair value of crypto holdings if fair value accounting were applied, the disclosed fair value if intangible asset accounting were applied but the amount or reasonable inputs were also provided to determine the fair value, or the book value if intangible asset accounting were applied and no inputs were provided to determine the fair value.

Table 4: Decomposing the Trend of Corporate Crypto Holdings

Quarter	(1) Number of Firms with Reported Crypto Holdings	(2) Quantities Held by Firms (*INF_QUANT*)	(3) Average BTC Price
2013 Q4	2	21,807	503
2014 Q1	3	22,440	701
2014 Q2	3	22,144	521
2014 Q3	4	23,681	534
2014 Q4	5	22,997	357
2015 Q1	5	24,133	251
2015 Q2	5	23,071	237
2015 Q3	4	23,483	255
2015 Q4	5	13,972	346
2016 Q1	5	14,555	411
2016 Q2	5	9,064	512
2016 Q3	6	10,077	616
2016 Q4	5	22,058	733
2017 Q1	4	21,681	1,035
2017 Q2	5	21,690	1,913
2017 Q3	6	24,143	3,482
2017 Q4	11	428	9,507
2018 Q1	17	2,729	10,568
2018 Q2	20	2,438	7,767
2018 Q3	19	1,217	6,821
2018 Q4	14	1,476	5,200
2019 Q1	14	17,447	3,799
2019 Q2	16	9,902	7,301
2019 Q3	15	10,712	10,382
2019 Q4	17	261,856	8,019
2020 Q1	12	307,929	8,268
2020 Q2	12	387,981	8,666
2020 Q3	16	570,297	10,634
2020 Q4	24	771,183	16,841
2021 Q1	25	922,846	45,324
2021 Q2	38	1,069,641	46,498
2021 Q3	42	1,122,403	41,989
2021 Q4	54	1,173,415	55,881

This table corresponds to Figure 2 and reports the number of firms that report holding crypto (column 1), the inferred quantities of crypto held (*INF_QUANT*) held by these firms by calendar quarter (column 2), and the average closing price of BTC (column 3), by calendar quarter. The sample spans from 2013Q4 to 2021Q4; a firm's fiscal quarter is aligned to the calendar quarter in which the fiscal period ends. In column 2, the quantity held for each firm-quarter is determined using the inferred fair value and the closing BTC price as of the last day of the firm's given fiscal quarter.

Table 5: Accounting Methodology Choices by Quarter

Quarter	(1) Firms Disclosing Impairment Trigger (*DISCL_TRIG=1*)	(2) Firms with Lowest Price Since Acquisition Trigger (*TRIG_LOW=1*)
2013 Q4	100%	0%
2014 Q1	100%	0%
2014 Q2	100%	0%
2014 Q3	100%	0%
2014 Q4	100%	0%
2015 Q1	100%	0%
2015 Q2	100%	0%
2015 Q3	100%	0%
2015 Q4	100%	0%
2016 Q1	100%	0%
2016 Q2	100%	0%
2016 Q3	100%	0%
2016 Q4	100%	0%
2017 Q1	100%	0%
2017 Q2	100%	0%
2017 Q3	100%	0%
2017 Q4	100%	0%
2018 Q1	100%	0%
2018 Q2	80%	0%
2018 Q3	54%	0%
2018 Q4	55%	0%
2019 Q1	45%	20%
2019 Q2	46%	17%
2019 Q3	50%	33%
2019 Q4	54%	14%
2020 Q1	25%	0%
2020 Q2	33%	33%
2020 Q3	40%	50%
2020 Q4	47%	33%
2021 Q1	48%	60%
2021 Q2	47%	69%
2021 Q3	41%	79%
2021 Q4	60%	77%

This table presents information on the accounting methodology choices for each calendar quarter. Column 1 presents the ratio of firms that disclose the crypto price used to trigger an impairment test, calculated on the basis of firms that apply intangible asset accounting (*DISCL_TRIG*). Column 2 presents the ratio of firms that use the lowest price since acquisition to trigger an impairment test, calculated on the basis of firms that apply intangible asset accounting and disclose the impairment trigger used (*TRIG_LOW*).

Table 6: Voluntary Fair Value Disclosure

Quarter	(1) Firms Disclosing Fair Value (DISCL_FV_AMT=1)	(2) Firms Disclosing Inputs to Determine Fair Value (DISCL_FV_INPUTS=1)	(3) Firms with No Fair Value Disclosure (DISCL_FV=0)
2013 Q4	100%	0%	0%
2014 Q1	100%	0%	0%
2014 Q2	100%	0%	0%
2014 Q3	50%	0%	50%
2014 Q4	50%	0%	50%
2015 Q1	33%	33%	33%
2015 Q2	50%	0%	50%
2015 Q3	50%	0%	50%
2015 Q4	50%	0%	50%
2016 Q1	0%	0%	100%
2016 Q2	0%	0%	100%
2016 Q3	0%	0%	100%
2016 Q4	50%	0%	50%
2017 Q1	100%	0%	0%
2017 Q2	100%	0%	0%
2017 Q3	50%	0%	50%
2017 Q4	0%	0%	100%
2018 Q1	0%	0%	100%
2018 Q2	0%	0%	100%
2018 Q3	15%	8%	77%
2018 Q4	18%	0%	82%
2019 Q1	0%	0%	100%
2019 Q2	0%	8%	92%
2019 Q3	8%	8%	83%
2019 Q4	8%	15%	77%
2020 Q1	13%	13%	75%
2020 Q2	22%	11%	67%
2020 Q3	30%	20%	50%
2020 Q4	32%	21%	47%
2021 Q1	29%	19%	52%
2021 Q2	21%	15%	65%
2021 Q3	32%	12%	56%
2021 Q4	33%	14%	53%

This table presents information on the level of voluntary fair value disclosure for firms in our sample that apply intangible asset accounting. Columns 1 through 3 present the ratio of firms for a calendar quarter that disclose the total fair value of crypto holdings (*DISCL_FV_AMT*), the inputs to determine fair value (i.e., price and/or quantity) (*DISCL_FV_INPUTS*), and no fair value information (*DISCL_FV=0*), respectively.

Table 7: Fair Value Reporting and Liquidity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	POST = 0	POST = 1	Test of	POST = 0	POST = 1	Test of	POST = 0	POST = 1	Test of
	DV = ACCTG_FV		Difference	DV = ACCTG_FV		Difference	DV = ACCTG_FV		Difference
TOT_VOL	0.0292***	-0.0028**	-0.032***						
	(2.70)	(-2.12)	(0.00)						
VOL_MKT				5.8922***	0.5714	-5.3208***			
				(2.67)	(1.34)	(0.01)			
AMIHUD							-0.2261**	26.2069	26.433
							(-2.04)	(1.25)	(0.24)
RET_AVG_BTC	5.8511	3.0944		4.8826	-0.9460		0.3740	2.5839	
	(0.86)	(0.65)		(0.72)	(-0.20)		(0.05)	(0.54)	
PCT_FV	0.4881**	0.0474**		0.4907**	0.0468**		0.4773**	0.0470**	
	(2.50)	(2.02)		(2.51)	(1.99)		(2.41)	(1.99)	
PCT_INC	-0.1344**	-0.0040		-0.1359**	-0.0037		-0.1325*	-0.0041	
	(-2.00)	(-0.88)		(-2.02)	(-0.80)		(-1.94)	(-0.90)	
LN_MKT	-0.0213**	0.0109***		-0.0212**	0.0112***		-0.0222**	0.0106**	
	(-2.16)	(2.64)		(-2.15)	(2.70)		(-2.23)	(2.56)	
MTB	0.0000	-0.0000		0.0000	-0.0000		0.0000	0.0000	
	(1.21)	(-0.00)		(1.26)	(-0.17)		(1.37)	(0.08)	
LEV	-0.0020***	-0.0003		-0.0021***	-0.0001		-0.0020***	-0.0003	
	(-2.91)	(-0.50)		(-2.97)	(-0.25)		(-2.87)	(-0.51)	
ROA	-0.0007	0.0021		-0.0006	0.0026		-0.0005	0.0024	
	(-1.22)	(0.60)		(-1.17)	(0.72)		(-0.91)	(0.68)	
Intercept	0.9603***	0.0994		0.9063***	-0.0415		1.1439***	-0.0185	
	(4.78)	(1.14)		(4.37)	(-0.46)		(5.77)	(-0.22)	
Observations	118	318		118	318		118	318	
R-squared	0.2346	0.0441		0.2334	0.0359		0.2134	0.0352	

This table presents the results of estimating equation (1) for the effect of crypto liquidity on the accounting methodology determination, using partitioned samples. Two observations from 2013 were excluded due to missing Bitcoin volume data. Columns 1, 4, and 7 present results for the pre-2018 shock period, while columns 2, 5, and 8 present results for the post-2018 shock period. Column 3, 6, and 9 present coefficient differences and p-values for the related Wald tests. All variables are defined in the Appendix. T-statistics are presented in parentheses below the corresponding coefficients. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on two-tailed tests).

Table 8: Fair Value Disclosure and Liquidity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	POST = 0	POST = 1	Test of Difference	POST = 0	POST = 1	Test of Difference	POST = 0	POST = 1	Test of Difference
	DV = DISCL_FV			DV = DISCL_FV			DV = DISCL_FV		
TOT_VOL	-0.0817***	0.0045***	0.0862***						
	(-2.99)	(2.78)	(0.00)						
VOL_MKT				-15.3968***	-0.6383	14.7585***			
				(-3.04)	(-1.18)	(0.01)			
AMIHUD							0.5676***	-69.3228***	-69.8904***
							(2.88)	(-2.62)	(0.01)
RET_AVG_BTC	0.9397	2.6756		8.7406	7.7833		23.4012	1.7584	
	(0.06)	(0.47)		(0.58)	(1.33)		(1.41)	(0.31)	
PCT_FV	11.0856***	0.1270***		11.6653***	0.1270***		8.9006**	0.1251***	
	(3.33)	(4.81)		(3.48)	(4.73)		(2.66)	(4.72)	
PCT_INC	0.0622	0.0018		0.0729	0.0014		0.0672	0.0021	
	(0.85)	(0.35)		(1.00)	(0.27)		(0.91)	(0.41)	
LN_MKT	0.1601**	0.0244***		0.1587**	0.0236***		0.1279**	0.0248***	
	(2.76)	(5.11)		(2.75)	(4.86)		(2.27)	(5.18)	
MTB	0.0017***	0.0000		0.0017***	0.0001		0.0014**	0.0000	
	(3.25)	(0.72)		(3.36)	(0.86)		(2.62)	(0.47)	
LEV	-0.0125***	-0.0002		-0.0131***	-0.0004		-0.0101**	-0.0001	
	(-3.10)	(-0.31)		(-3.26)	(-0.65)		(-2.47)	(-0.09)	
ROA	-0.0064*	0.0048		-0.0060	0.0041		-0.0039	0.0046	
	(-1.76)	(1.23)		(-1.67)	(1.04)		(-1.15)	(1.18)	
Intercept	-2.9107**	-0.2530**		-2.7686**	-0.0447		-2.6191**	-0.0254	
	(-2.43)	(-2.44)		(-2.34)	(-0.43)		(-2.20)	(-0.27)	
Observations	36	251		36	251		36	251	
R-squared	0.4435	0.1828		0.4482	0.1616		0.4331	0.1801	

This table presents the results of estimating equation (2) for the effect of crypto liquidity on the level of fair value disclosure, using partitioned samples of firm-quarter observations that apply intangible asset accounting. One observation from 2013 was excluded due to missing Bitcoin volume data. Columns 1, 4, and 7 present results for the pre-2018 shock period, while columns 2, 5, and 8 present results for the post-2018 shock period. Column 3, 6, and 9 present coefficient differences and p-values for the related Wald tests. All variables are defined in the Appendix. *T*-statistics are presented in parentheses below the corresponding coefficients. *, **, and *** indicate significance at the 0.10, 0.05, and 0.01 levels, respectively (based on two-tailed tests).