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How Many Public Corporations Recognise "Token Economy" Technologies as Materially Significant? Evidence from 10-K Reports

Mary C. Lacity, Le Kuai, Jeffrey K. Mullins
Sam M. Walton College of Business, University of Arkansas, USA

Correspondence: mclacity@uark.edu
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Abstract
The token economy promises to enable entirely new business models that will likely disrupt many market leaders. The seeds for disruption are already upon us, powered by technical innovations such as blockchains, fungible tokens, non-fungible tokens, metaverses, and decentralised autonomous organisations. How seriously are corporations taking these emerging token economy technologies? How many corporations envision these technologies to be materially significant to their business today? We answered these questions for United States (US) corporations by analysing the five most recent annual 10-K reports, a report required by the US Securities and Exchange Commission (SEC). Of the 39,522 10-K reports examined, only five percent of corporations recognise token economy technologies as materially significant. We focus upon the top 21 corporations with the most mentions of these technologies and discuss the results through the lens of the Theory of Disruptive Innovation.

Keywords: *enterprise blockchain, cryptocurrency, virtual worlds, metaverse, non-fungible tokens (NFTs), stable coin, decentralised autonomous organisation (DAO), Web 3.0, token economy*

JEL Classifications: *G10, G20, G30*

1. Introduction

The "token economy" is a term used to describe new economic models made possible by tokenised digital assets. Bitcoin, launched in 2009, was the bellwether application. Satoshi Nakamoto wanted to eliminate the need for financial intermediaries to validate transactions, but Nakamoto still needed somebody trustworthy to perform the validation functions. Nakamoto's brilliant solution was to incentivise an anonymous community to validate and secure peer-to-peer transactions by paying the validators with new digital tokens called "bitcoins" [1].

Thirteen years later, we find a Cambrian explosion of tokenised assets, including over 20,000 fungible tokens, serving a variety of functions, including stable coins, which peg digital tokens to assets like sovereign currencies, barrels of oil, and ounces of gold [2]. We also have millions of non-fungible tokens (NFTs) – a unique digital token that represents a particular asset in the physical or virtual world. While we must be careful to separate technical functionality of an NFT (control over an NFT by possessing the private key) from legal ownership as defined by law and which varies by jurisdiction, NFTs allow new economic models of digital commerce like fractionalised ownership and peer-to-peer sales.

In addition to fungible and non-fungible tokens, other foundational technologies for the token economy include blockchains to immutably record transactions and decentralised autonomous organisations (DAOs) to provide new ways to organise and govern economic activities. Token economy transactions will increasingly happen in metaverses, where our digital avatars interact in persistent virtual worlds for work, play, and commerce. These technologies are sometimes bundled as "Web 3.0" – a term used to describe the next version of the Internet where users own and monetise their own data and digital assets, exchange value peer-to-peer without relying on trusted third parties, and control their identities and credentials in digital wallets – but Web 2.0 ecosystems (with a centralised platform provider) will also leverage the token economy. Although it's still the early days, the disruption to existing business models is inevitable [3].

2. Methodology

How seriously are United States (US) corporations taking these emerging technologies? How many corporations envision these technologies to be materially significant to their business today? One place to find the answers to these questions is Form 10-K, a report the US Securities and Exchange Commission (SEC) requires corporations to file annually. Some of the information a company is required to disclose in the 10-K includes details on the nature of its business, risk factors, financial data, organisational structure, subsidiaries, and management's discussion and analysis about the financial and operational results. Because it is regulated by

the SEC, audited by an independent auditor, and scrutinised by analysts and institutional investors, the 10-K is considered a credible report and source of information [4]. Given its inherent credibility compared to, say, a press release or social media post, as well as the focus of these reports on current shareholders and future investors, we examine corporations' propensity to discuss blockchains, cryptocurrencies, metaverses, and other token economy technologies in their 10-K reports to assess the degree of investments and/or recognised risks of these technologies [5].

We used the SEC's Edgar database to extract the five most recent 10-K and associated 10-K/A (amendment) reports that mentioned the terms "blockchain," "cryptocurrency," "virtual worlds/metaverse," "NFT," "stable coin," "DAO," and "Web 3.0." The five most recent reports for each corporation spanned the time period from June 16, 2017 to June 15, 2022. We counted the number of corporations that mention each keyword, tallied the number of times a corporation used them, and analysed the results for the corporations that most frequently mentioned them.

3. Results

We adopt a data-driven exploratory approach with the goal of identifying emergent token economy trends among US corporations. We share four insights from our analysis:

3.1. In formal 10-K disclosure reports, 95% of corporations didn't reveal any efforts associated with these technologies and did not yet recognise relevant material threats to their business

Of the 39,522 10-K reports in the database spanning the five most recent filings, only 1,940 10-K reports – representing about five percent – mentioned one or more of these technologies. If they are pursuing any of these technologies, they are not reporting on them because they have yet to materially impact their businesses, risk factors, and/or financial and operational results.

3.2. For the five percent of corporations that invest in or recognise the risks of token economy technologies, blockchains, and cryptocurrencies are more materially significant than other token economy technologies

Among the 10-K reports:

- **Blockchain** was mentioned 14,405 times by 645 corporations
- **Cryptocurrency** was mentioned 9,778 times by 333 corporations
- **Virtual world/Metaverse** was mentioned 331 times by 77 corporations
- **NFT** was mentioned 519 times by 55 corporations
- **Stable coin** was mentioned 51 times by eight corporations
- **Web 3.0** was mentioned 21 times by eight corporations
- **Decentralised autonomous organisation (DAO)** was mentioned five times by three corporations

On the one hand, it's not surprising that blockchains and cryptocurrencies have more mentions by more corporations because they have been around longer than NFTs, stable coins, and DAOs. On the other hand, virtual worlds/metaverses predate blockchains and cryptocurrencies; most notably with Linden Lab's launch of Second Life in 2003, but the combined terms of virtual world/metaverse was only found in 91 reports across 77 corporations.

3.3. The material significance of the technologies increased over time

Figure 1 shows the breakdown by year. Except for the dip in the number of corporations mentioning cryptocurrency in 2020, all seven technologies are becoming more materially significant. What's even more compelling is that many corporations have yet to file 10-K reports in 2022, so 2022 counts are likely under-reported.

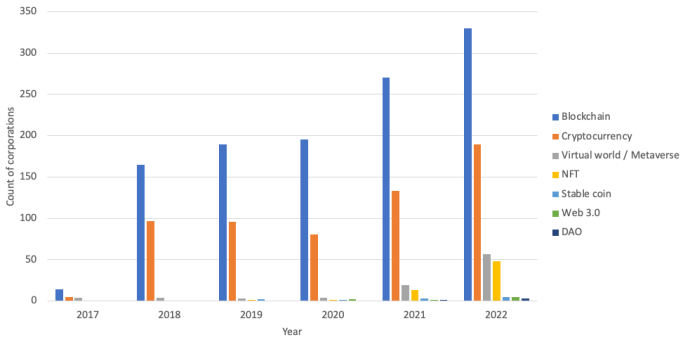

Figure 1. Number of corporations that mentioned a keyword at least once in a 10-K report

3.4. Meet the top 21 corporations that find token economy technologies to be materially significant

Figure 2 lists the top three corporations that mentioned each of the seven keywords most frequently, resulting in 21 distinct corporations. We also wanted to see if there was a pattern among the corporations: Are they outperforming the pack? Are they primarily newer or older corporations? Which industries dominate? We analysed revenues, profits, market capitalisation, Standard Industrial Classification (SIC) code, and age of firm. We only found two patterns. First, corporations in the services sector dominate the list, including business services, prepackaged software services, and computer processing services. Retail is the next most common sector among these 21, including catalog and mail-order houses, computer software, and retail stores. Second, the most consistent financial story was one of recent financial losses: 18

reported financial losses during their most recent 10-K reporting period. Most corporations attributed the losses to impacts of COVID-19, not to the failure of these technologies.

Among the three corporations that did not suffer recent financial losses, two are trusts that do not report revenues or profits. The other exception was Overstock.com; it reported positive earnings on its 2021 gross revenues of $2.8 billion. The biggest move it made related to these technologies was a divestment. Overstock.com divested from Medici Ventures and its blockchain assets: "after six years of committed effort to advance blockchain technology, Overstock has determined that the Medici Ventures businesses will be better served under the management of Pelion, a professional asset manager with technology expertise in early-stage companies."

Keyword	Top Three Corporations by Frequency of Keyword Mentioned (2017–2022)	# of Mentions	Standard Industrial Classification Code
Blockchain	BTCS (BTCS)	689	**7372** SERVICES-PREPACKAGED SOFTWARE
	Overstock.com (OSTK)	515	**5961** RETAIL-CATALOG & MAIL-ORDER HOUSES
	Future FinTech Group Inc. (FTFT)	481	**7389** SERVICES-BUSINESS SERVICES, NEC
Cryptocurrency	Riot Blockchain (RIOT)	842	**7374** SERVICES-COMPUTER PROCESSING & DATA PREPARATION
	BitNile Holdings, Inc. (NILE)	701	**3679** ELECTRONIC COMPONENTS, NEC
	Red Cat Holdings, Inc. (RCAT)	388	**7372** SERVICES-PREPACKAGED SOFTWARE
Virtual world/metaverse	Super League Gaming, Inc. (SLGG)	57	**7900** SERVICES-AMUSEMENT & RECREATION SERVICES
	Esports Entertainment Group, INC. (GMBL, GMBLW)	31	**7900** SERVICES-AMUSEMENT & RECREATION SERVICES
	Worlds, Inc. (WDDD)	26	**7372** SERVICES-PREPACKAGED SOFTWARE
NFT	Takung Art Co. (TKAT)	105	**5990** RETAIL-RETAIL STORES, NEC
	1stdibs.com (DIBS)	51	**5961** RETAIL-CATALOG & MAIL-ORDER HOUSES
	Vinco Ventures (BBIG)	42	**3944** GAMES, TOYS & CHILDREN'S VEHICLES
Stable coin	Innovative Payment Solutions (IPSI)	27	**5961** RETAIL-CATALOG & MAIL-ORDER HOUSES
	Coro Global Inc (CGLO)	8	**7372** SERVICES-PREPACKAGED SOFTWARE
	CurrencyWorks (CWRK)	6	**7389** SERVICES-BUSINESS SERVICES, NEC
Web 3.0	Troika Media Group (TRKA, TRKAW)	6	**4841** CABLE & OTHER PAY TELEVISION SERVICES
	MCX Technologies (MCCX)	4	**7372** SERVICES-PREPACKAGED SOFTWARE
	GameStop Corp. (GME)	3	**5734** RETAIL-COMPUTER & COMPUTER SOFTWARE STORES
DAO	Core Scientific (CORZ, CORZW)	2	**7374** SERVICES-COMPUTER PROCESSING & DATA PREPARATION
	Grayscale Ethereum Trust (ETH) (ETHE)	2	**6199** FINANCE SERVICES
	Grayscale Ethereum Classic Trust (ETC) (ETCG)	1	**6221** COMMODITY CONTRACTS BROKERS & DEALERS

Figure 2: Corporations that most frequently mentioned a keyword

4. Discussion

Overall, our analysis of 10-K reports suggests that most public corporations are moving more slowly to the token economy than suggested by media coverage or do not yet recognise the impact the token economy will have on their business. The nascent and evolving legislative and regulatory infrastructure around the token economy complicates adoption of these technologies and recognition of material impacts [6]. This makes us ask: Will incumbents be ready for the disruption caused by the token economy? Current market leaders may dismiss the companies in Figure 2 as non-threatening due to current financial losses, but they could benefit from a history lesson.

Remember Blockbuster? Founded in 1985 in Dallas, Texas, its business model was based on retail brick-and-mortar stores that rented videos to customers. Netflix was founded in 1997, a year when Blockbuster earned $3.54 billion in revenues. The next year, Netflix lost $11 million while Blockbuster continued to grow – tiny Netflix hardly seemed a threat to Blockbuster. Initially, Netflix mailed videos stored on physical devices to customers. When the Internet advanced enough to transmit large digital files, Netflix easily pivoted from mail delivery to digital streaming services, whereas Blockbuster could not. Blockbuster was too encumbered by its retail model, and it went bankrupt in 2010 [7].

Why don't market leaders see disruption coming? The late great business theoretician Professor Clayton Christensen sought to answer this question. Beginning with his first book on the subject, the *Innovator's Dilemma* [8], Christensen noted that market leaders spend most of their resources pursuing sustaining innovations, i.e., those innovations that incrementally improve products and services within existing markets. He defined **disruptive innovation** as a *process* by which a new entrant creates a new market that eventually disrupts an existing market, thereby displacing the market leaders. New entrants have little to lose, are less risk-averse, and are unconstrained by legacy investments and bureaucracy. Because market leaders cannot monitor every possible source of disruption (most ideas fail anyway), it's often too late to pivot when a real threat emerges [9].

5. Conclusion

We assert that token economy technologies are a real threat to current business models that generate revenues by serving as a trusted third party. Bitcoin proves we can validate transactions without them, and it is only the beginning. Beyond peer-to-peer payments, the token economy will affect every industry, so it's time for corporations to take it seriously.

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