

STABLECOINS IN CRYPTOECONOMICS.
FROM INITIAL COIN OFFERINGS (ICOS) TO CENTRAL
BANK DIGITAL CURRENCIES (CBDCS)

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Abstract

In the course of their growth and their more recent crisis, cryptocurrencies suffered from tremendous volatility. Volatility impaired cryptocurrencies' ability to serve the needs generally associated with currencies, i.e. serve as a store of value as well as a medium of exchange and a unit of account. For this reason, developers and entrepreneurs have explored the opportunity to design "stablecoins", stable cryptocurrencies, pegged to fiat currencies such as the US dollar and Euro. Stablecoins should in principle be stabilized recurring to collateral (in fiat currency, precious metal, or a basket of cryptocurrencies) or implementing algorithmic "seigniorage" mechanisms.

This Article analyzes stablecoins' main characteristics, identifies their main categories, and also considers their role in cryptoeconomics and their infrastructural vocation for future developments of the distributed ledger technology. Furthermore, this Article builds on the problems affecting stablecoins, focusing in particular on: the apparent contradiction in implementing a fully decentralized system that is based on a central validator; the endemic opaqueness of auditing operations, in particular the collateral and the algorithmic stabilization mechanisms; conflict of interests emerging from stablecoins' relationship with cryptoexchanges; and their role in the recent Bitcoin bubble. Finally, this Article highlights the regulatory uncertainty at the level of securities and commodities law that may characterize stablecoins in the same way as initial coin offerings (ICOs), and opens to the possibility that stablecoins may trigger a more active reaction from governments and central bankers in designing and effectively implementing central bank digital currencies (CBDCs). More broadly, this Article aims to highlight the factual

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interconnections linking ICOs, cryptocurrencies, stablecoins and CBDCs: although these entities belonging to different contexts (securities law and capital formation, payment systems, monetary policy), they are intertwined and are part of the same evolution.

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I. INTRODUCTION

In recent years, cryptocurrencies have emerged as a new phenomenon in economy and finance. Bitcoin was theorized and launched in 2008, with Satoshi Nakamoto's famous paper "Bitcoin: A Peer-to-Peer Electronic Cash System."¹ In 2012, J.R. Willett, in his second foundational whitepaper, "The Second Bitcoin Whitepaper," discussed the possibility of creating new coins on top of Bitcoins,²

¹ Satoshi Nakamoto, *Bitcoin: A Peer-to-Peer Electronic Cash System* (2010).

² J.R. Willett, *The Second Bitcoin Whitepaper* (Jan. 2012), https://e33ec872-a-62cb3a1a-s-sites.googlegroups.com/site/2ndbtcwpaper/2ndBitcoinWhitepaper.pdf?attachauth=ANoY7cqs8JUDxucV6cOFLhG7t6hYI1vR8IcUIKJGPox0Fw-t2p161_Qz5TUa2K3DGZ7S5pn2Z15hgQnpPFNkWjVCMGmHzsaV_x2Uw2iInxJuJSyEOS_ZIH8rIX5asUhKkaI16_uxUNCKjFDkBzO4hIWAXxIpXbXVtV1ZS_i-_ubQWzqG1HBmT9gNvA9PyN2zL0Jn2lh6lBgKO5Bgm6rX64mzEfV1rjukkBpPG_4EZI9C0m-An1FO0iA%3D&attredirects=0. As the author explains in the summary "We

opening a new era in so-called “cryptoeconomics.” Not surprisingly, the same entrepreneur launched the first initial coin offering (ICO), Mastercoin³ (now Omni⁴).

The story that followed is well-known: new so-called “alternative coins” or cryptocurrencies proliferated, generally supported by their own underlying blockchain technology. This new wave of entrepreneurial initiatives raised the concern of regulators (in particular securities and commodities regulators) as well as governments and central bankers, for the implications that privately issued money-like instruments could have in terms of monetary policy and financial stability.⁵ According to the website CoinMarketCap, more than 2,000 cryptocurrencies exist today.⁶ Cryptocurrencies reached the peak of their popularity and value capitalization last year, also driven by the growing popularity of ICOs, with entrepreneurs and academics looking at ICOs as one of the most revolutionary tools in entrepreneurial finance in recent years.⁷

Notwithstanding their incredible wave of popularity and a growing penetration of the blockchain technology in different markets, cryptocurrencies experienced a significant decline in terms of market capitalization starting in January 2018. Regulators regarded the blockchain technology with growing favor, looking at a more systematic large-scale adoption. However, the same did not happen for cryptocurrencies, due to specific factors. A major cause was an uncertain regulatory framework in 2017–2018,⁸ followed by growing regulatory pressure and enforcement action aimed at restoring investors’ confidence and market integrity.⁹ In fact, a significant number of scams¹⁰ occurred,

claim that the existing bitcoin network can be used as a protocol layer, on top of which new currency layers with new rules can be built We further claim that the new protocol layers ... will provide initial funds to hire developers to build software which implements the new protocol layers, and ... will richly reward early adopters of the new protocol”.

³ See Marco Dell’Erba, *Initial Coin Offerings: The response of regulatory authorities*, 14 N.Y.U. J. L. & BUS. 3 (2018).

⁴ See Laura Shin, *Here's The Man Who Created ICOs And This Is The New Token He's Backing*, FORBES (Sep. 21, 2017), <https://www.forbes.com/sites/laurashin/2017/09/21/heres-the-man-who-created-icos-and-this-is-the-new-token-hes-backing/#108e76ad1183>.

⁵ See *infra* Part 3d.

⁶ See CoinMarketCap, <https://coinmarketcap.com/all/views/all/>.

⁷ Sabrina Howell, Marina Niessner, & David Yermack, *Initial Coin Offerings: Financing Growth with Cryptocurrency Token Sales* (European Corporate Governance Institute (ECGI) - Finance Working Paper No. 564/2018, 2018), at 2.

⁸ See Dell’Erba, *supra* note 3.

⁹ See Marco Dell’Erba, *Initial Coin Offerings (ICOs). From Inactivity to Full Enforcement. The implementation of the “Do-no Harm” Approach*, SSRN (2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3194863.

¹⁰ Satis Group, *Cryptoasset Market Coverage Initiation: Network Creation* (Jul. 11, 2018), https://research.bloomberg.com/pub/res/d28giW28tf6G7T_Wr77aU0gDgFQ. The report quantifies in 78% the number of scams in context of ICOs (p. 24). See also

most of them on the Ethereum platform in the form of Ponzi schemes or phishing.¹¹ Furthermore, behavioral reasons, mostly related to users' aversion to new technologies, significantly slowed down this process. In addition, structural deficiencies such as the scalability¹² of the blockchain technology were particularly critical for cryptocurrencies.

All these resulted in a high degree of volatility, made worse by specific structural characteristics of cryptocurrencies, in particular that traditional cryptocurrencies are not the liability of any institution and are not backed by assets, coupled with rigid issuance rules.¹³ Among these deficiencies, cryptocurrencies' novelty in the economic landscape was a physiological cause for volatility. Although volatility may be perceived as pathological, it is part of a physiological process of establishment of a novel framework in economy. In recent years, the Nasdaq Composite Index experienced huge losses, equal to a 78% peak-to-trough decline after the dot-com bubble burst in 2000.¹⁴ Cisco lost 86% from its peak and Amazon 95% from 1999 to 2001, passing from \$107 to \$5.97.¹⁵ Furthermore, significant volatility characterized the year 2018 in many different markets, from capital markets (where volatility returned to the average after a "calm" 2017)¹⁶ to the art market.¹⁷

Volatility has impaired the opportunity for cryptocurrencies to establish themselves as a unit of account and limited the opportunity for consumers to use them as a means of exchange in business transactions. At the same time, volatility damaged long-term investors approaching

Hugo Benedetti and Leonard Kostovetsky, Leonard, Digital Tulips? Returns to Investors in Initial Coin Offerings (May 20, 2018), <https://ssrn.com/abstract=3182169>.

¹¹ Gareth Jenkinson, *From Ponzi Schemes to ICO Exits, Ethereum's Blockchain Has Been the Platform of Choice for Scammers*, COINTELEGRAPH (Feb. 4, 2018), <https://cointelegraph.com/news/from-ponzi-schemes-to-ico-exits-ethereums-blockchain-has-been-the-platform-of-choice-for-scammers>.

¹² Connor Blenkinsop, *Blockchain's Scaling Problem, Explained*, COINDESK (Aug. 22, 2018), <https://cointelegraph.com/explained/blockchains-scaling-problem-explained>.

¹³ See IMF, *Casting Light on Central Bank Digital Currency* (Nov. 12, 2018), <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2018/11/13/Casting-Light-on-Central-Bank-Digital-Currencies-46233>.

¹⁴ Michael Patterson, *Crypto's 80% Plunge Is Now Worse Than the Dot-Com Crash*, BLOOMBERG (Sep. 12, 2018), <https://www.bloomberg.com/news/articles/2018-09-12/crypto-s-crash-just-surpassed-dot-com-levels-as-losses-reach-80>.

¹⁵ Hu Liang, *The Intrinsic Value of Crypto (What the Bubble Hasn't Changed)*, COINDESK (Dec. 16, 2018), <https://www.coindesk.com/the-intrinsic-value-of-crypto-what-the-bubble-hasnt-changed>

¹⁶ Sarah Hansen, *Market Volatility: A Return To The Old Normal*, FORBES (Dec. 12, 2018), <https://www.forbes.com/sites/sarahhansen/2018/12/12/market-volatility/#7035607971f0>

¹⁷ See Kelly Crow, *'Things Are Just Blurry': Auction Houses Brace For a Volatile Year*, WALL ST. J. (Feb. 7, 2019), <https://www.wsj.com/articles/things-are-just-blurry-auction-houses-brace-for-a-volatile-year-11549515541>.

cryptocurrencies as a long-term store of value.¹⁸ Although the establishment of the blockchain technology goes beyond the sole purpose of creating a currency, the overall instability of cryptocurrencies is regarded as a key obstacle to the development of blockchain as an ecosystem. High volatility impacts the cryptoeconomics mechanisms, making costs and incentives highly unpredictable.¹⁹

In such a context, “stablecoins” emerged as a new phenomenon in cryptoeconomics, complementary to well-known “traditional” cryptocurrencies. The growing attention to stablecoins is mostly due to their promise of solving structural problems emerging in the blockchain ecosystem. Although the mechanics supporting each stablecoin can be complex, they all share the same purpose of holding a stable value, favoring their use as traditional currencies, i.e. being a store of value as well as a medium of exchange and unit of account.²⁰ Their market value marked an impressive growth of 700% in 2018²¹ and are gaining momentum in 2019.²² Stablecoins emerged as a global phenomenon, with projects in North America and Europe (the two leading blocks), Asia, the Middle East and Oceania. It is surprising that no stablecoin projects emerged in China and Japan, notwithstanding their position as leading cryptocurrency trading markets.²³

The first and most capitalized stablecoin is Tether, now under scrutiny after the controversial news on the real existence of a collateral.²⁴ Originally called Realcoin and subsequently rebranded in order not to be associated with other alt-coins,²⁵ Tether was launched in 2014 and listed in the cryptocurrency Bitfinex in 2015.²⁶ It now accounts for 93% of the

¹⁸ Kingsley Advani, *The Top 6 Stablecoins in Crypto*, MEDIUM (Feb. 23, 2018), <https://medium.com/@kingsleyadvani/the-top-6-stable-coins-in-crypto-e6f53e9b03be>

¹⁹ Nathan Sexer, *State of Stablecoins, 2018*, MEDIUM (Jun. 24, 2018), <https://media.consensys.net/the-state-of-stablecoins-2018-79ccb9988e63>.

²⁰ See David Yermack, *Is Bitcoin a Real Currency? An Economic Appraisal* (NBER Working Paper Series, 2013) <https://www.nber.org/papers/w19747.pdf>.

²¹ See Fan Wen, *Stablecoin—“bad” idea, “good” investment*, MEDIUM (Sep. 30, 2018), <https://medium.com/coinmonks/stablecoin-bad-idea-good-investment-f35b79b21016>.

²² See Rachel Wolfson, *Stablecoins Could Unleash Wall Street Adoption Of Blockchain Technology*, FORBES (Feb. 20, 2019), <https://www.forbes.com/sites/rachelwolfson/2019/02/20/stablecoins-could-unleash-wall-street-adoption-of-blockchain-technology/#a40ae14453c9>.

²³ See Blockchain, *The State of Stablecoins* (Sep. 2018), <https://www.blockchain.com/research>.

²⁴ See *infra* Part III A.

²⁵ Pete Rizzo, *Realcoin Rebrands as ‘Tether’ to Avoid Altcoin Association*, COINDESK (Nov. 20, 2014), <https://www.coindesk.com/realcoin-relaunches-tether-avoid-altcoin-association>.

²⁶ Siamak Masnavi, *The Tether (USDT) Story: How the World’s Most Popular Stablecoin Became a Lot Less Stable*, CRYPTO GLOBE (Oct. 15, 2018), <https://www.cryptoglobe.com/latest/2018/10/the-tether-usdt-story-how-the-worlds-most-popular-stablecoin-became-a-lot-less-stable/>.

total market value of stablecoins.²⁷ Furthermore, the downturn affecting almost the totality of the existing cryptocurrencies is one of the factors that has made stablecoins gradually more popular, attracting institutional investors (such as Goldman Sachs and more recently JP Morgan Chase) and venture capitalists.²⁸ As a consequence, Tether is now ranked among the top five cryptocurrency assets by market cap.²⁹ As of September 2018, fifty-seven stable coins were under development, twenty-three live and the rest at a pre-launch phase, for a total value capitalization of \$3 billion, equal to the 1.5% of the total market value of all cryptoassets.³⁰

This Article is structured as follows. Part II analyzes stablecoins' main characteristics, identifying the main categories that emerged in the market (in particular, collateralized and algorithmic stablecoins), and considers their role in cryptoeconomics. Part III analyzes stablecoins as part of a broader array of initiatives intended to promote the infrastructural development of the blockchain technology, and analyzes the problems related to each category of stablecoin. It further considers the relationship between stablecoins and other cryptocurrencies, focusing on the role that stablecoins, namely Tether, had in the Bitcoin bubble and the conflicts of interest existing at the level of cryptoexchanges. Finally, it assesses the applicability of the securities law in Europe and the United States in light of the problems that emerged in the context of cryptocurrencies' ICOs, and the commodities laws. It also briefly builds on the relationship between stablecoins and Central Bank Digital Currencies (CDBC's), an increasingly popular institutional initiative that involved governments, central bankers and international organizations interested in identifying a response to the proliferation of privately-issued digital currencies.

II. WHAT IS A STABLECOIN

A. *Stablecoins' main characteristics*

Stablecoins are cryptocurrencies maintaining a stable value against a target price, generally US dollars.³¹ Stablecoins generally

²⁷ Blockchain, *supra* note 23, at 4.

²⁸ See Steven Ehrlich, *Two Explanations For Venture Capital's Inexplicable Interest In Stablecoins*, FORBES (Sep. 25, 2018), <https://www.forbes.com/sites/stevenehrlich/2018/09/25/two-reasons-for-venture-capitals-inexplicable-interest-in-stablecoins/#7feef7321a57>.

²⁹ P.H. Madore, *Crypto Downturn Thrusts Tether into Top 5 in Market Cap Rankings*, CCN (Dec. 11, 2018), <https://www.ccn.com/crypto-downturn-thrusts-tether-into-top-5-in-market-cap-rankings/>.

³⁰ See Blockchain, *supra* note 23, at 4.

³¹ Sexer, *supra* note 19.

combine liquid collateral (such as gold or US dollar)³² or algorithmic mechanisms of stabilization with the management of the supply “to incentivize the market to trade the coin for no more or less than \$1.”³³ A collateral of high quality (extremely liquid such as US dollars or gold) should in principle lead to the dual effect of making the stablecoin both stable and liquid. A new wave of stablecoins implement models that use other digital assets as collateral or are not collateralized at all, opting for riskier algorithmic mechanisms of price stabilization.³⁴

ICOs experienced an exponential growth in 2017-2018, and emphasized the affinities existing between cryptocurrencies and equities rather than commodities and currencies. ICOs contributed to the great popularity of cryptocurrencies. Cryptocurrencies resulting from ICOs experienced significant problems, in particular an extreme volatility, in addition to a high number of scams. ICOs, cryptocurrencies and stablecoins (and CBDCs) are an example of the interconnections existing between securities and monetary issues, and the way an entity belonging to the world of securities, such as ICOs, may trigger significant consequence at the monetary level, and the payment system, as well as at the broadest level of pure monetary policy analysis (as confirmed by the developments in the context of CBDCs). In fact, while stablecoins are a consequence of the emergence of cryptocurrencies, they emerged as a rather distinct phenomenon, and work in a manner that can be compared to money market funds in the ecosystem of cryptocurrencies. Typically, money market funds invest in highly liquid cash or cash-equivalent securities, with a short-term maturity of less than thirteen months and the possibility to redeem their shares anytime at a stable value.³⁵

In a study for the European Parliament, Rosa Lastra and Jason Grant Allen identified three main characteristics of what qualifies “virtual currencies” as opposed to the “conventional types of financial industry”: virtual currencies make use of blockchain technology in an effort to make peer-to-peer easier, they are issued by an entity that is not a central bank or a licensed financial intermediary,³⁶ and are denominated in a novel unit

³² Sherman Lee, *Explaining Stable Coins, The Holy Grail Of Cryptocurrency*, FORBES (Mar. 12, 2018), <https://www.forbes.com/sites/shermanlee/2018/03/12/explaining-stable-coins-the-holy-grail-of-cryptocurrency/#4db76f8f4fc6>.

³³ Cryptocurrency Facts, *What is a Stable Coin?* (2019), <https://cryptocurrencyfacts.com/what-is-a-stable-coin/>.

³⁴ See Kirill Bryanov, *Breaking the Peg: Every Stablecoin Has Its Points of Failure*, COINTELEGRAPH (Nov. 18, 2018), <https://cointelegraph.com/news/breaking-the-peg-every-stablecoin-has-its-points-of-failure>.

³⁵ See James Chen, *Money Market Fund*, INVESTOPEDIA (last review Feb. 17, 2019), <https://www.investopedia.com/terms/m/money-marketfund.asp>.

³⁶ See Aleksander Berentsen and Fabian Schar, *The Case for Central Bank Electronic Money and the Non-case for Central Bank Cryptocurrencies*, FEDERAL RESERVE BANK OF SAINT LOUIS – ECONOMIC RESEARCH (Feb. 28, 2018),

of account rather than a fiat monetary unit.³⁷ These characteristics can be safely extended to stablecoins. In addition, a key characteristic distinguishing virtual currencies specifically from “book-money” is that no system of reserve is necessarily in place in virtual currency schemes. Due to the lack of lender of last resort being(?) different from bank deposits representing the liability of a commercial bank.³⁸ The theoretical existence of a collateral in the form of fiat currency for those stablecoins implementing this means of stabilization (see below) would make this general difference between virtual currency schemes and “book-money” less marked.

Furthermore, while stablecoins use mechanisms capable of minimizing exchange rate volatility³⁹ that other cryptocurrencies do not have (making them “price-stabilized cryptocurrencies”⁴⁰), they share with these the main features of programmability, efficiency and fungibility.⁴¹ However, while some articles tend to conclude that both stablecoins and traditional cryptocurrencies share another key feature of being “open and permissionless,” this is less clear. While traditional cryptocurrencies are “open and permissionless” since they are built on a public blockchain and therefore can be downloaded without any permission,⁴² this cannot be entirely extended to stablecoins.⁴³ Fiat-currency collateralized stablecoins (such as Tether) are linked to reserves (for example, in US dollars) that the issuer directly or indirectly holds in a bank; therefore, they cannot be permissionless. However, in the secondary market they become somehow permissionless because they do not need any agreement to be sold to third parties.

From a structural perspective, stablecoins are generally built on top of the Ethereum blockchain protocol: the reason for this choice depends on the opportunity to instantaneously improve the compatibility of the newly issued asset with the pre-existing infrastructure and therefore with “second generation” applications similarly built on top of the same

<https://research.stlouisfed.org/publications/review/2018/02/13/the-case-for-central-bank-electronic-money-and-the-non-case-for-central-bank-cryptocurrencies/>.

³⁷ See Rosa Lastra & Jason Grant Allen, *Virtual currencies in the Eurosystem: challenges ahead* (July 2018), http://www.europarl.europa.eu/cmsdata/150541/DIW_FINAL%20publication.pdf.

³⁸ *Id.*

³⁹ Blockchain, *supra* note 23, at 7.

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² See Aaron Hankin, *JPM Coin is not a cryptocurrency, says crypto advocacy group*, MARKETWATCH (Feb. 15, 2019), <https://www.marketwatch.com/story/jpm-coin-is-not-a-cryptocurrency-says-crypto-advocacy-group-2019-02-14>.

⁴³ See Kyle Torpey, *Opinion: Stablecoins Have No Need for Public Blockchains*, LONGHASH (Feb. 7, 2019), <https://www.longhash.com/news/opinion-stablecoins-have-no-need-for-public-blockchains>.

blockchain protocol.⁴⁴ This is very important for the way wallets operate, with potential benefits for e-commerce; further advantages depend on the adoption of the so-called ERC20 standard by the stablecoin, with the possibility of using such stablecoins with any other application similarly designed on that standard. There is an additional advantage for developers and fintech to have a “programmable dollar,” facilitating the phase of programming.⁴⁵ Furthermore, Ethereum platform-based stablecoins allow users improved opportunities for tracking the circulation of the tokens via specific “block explorers,” such as Etherscan.⁴⁶ Block explorers are decentralized applications (so-called “dapps”),⁴⁷ generally underpinned by the Ethereum network, and their main function consists of allowing users to “lookup, confirm, and validate transactions that have taken place on the Ethereum Blockchain”⁴⁸. They have been widely used by the industry as the basic tool for data query and data analysis on the blockchain. Due to the characteristic of tokens being stored in smart contracts, US dollars stored in a particular stablecoin can be tracked by users.⁴⁹

The process leading to the issuance of stablecoins does not differ from any “traditional” ICO.⁵⁰ However, Basis (a newly launched stablecoin that shut down),⁵¹ which was one of the largest token sales in 2018 with \$133 million, has confirmed a transformation for the trend that ICOs did not prove to be as “democratic,” “inclusive”⁵² and revolutionary⁵³ as they were supposed to be. Due to regulatory needs (with the SEC strengthening its enforcement on ICOs) and a more mature market, the majority of ICOs were structured as private sales exclusively targeting institutional investors or accredited investors. Furthermore, stablecoins in particular captured the attention of venture capitalists and

⁴⁴ Joseph Young, Why New Generation Stablecoins are Crucially Based on Ethereum, CCN (Oct. 24, 2018), <https://www.ccn.com/why-new-generation-stablecoins-are-crucially-based-on-ethereum/>. The author considers that “users of GUSD, PAX, and TUSD can utilize hardware wallets like Trezor and Ledger along with software wallets such as Metamask to send and receive stablecoins”.

⁴⁵ See Coinbase, *Coinbase and Circle announce the launch of USDC—a Digital Dollar*, MEDIUM (Oct. 23, 2018), <https://blog.coinbase.com/coinbase-and-circle-announce-the-launch-of-usdc-a-digital-dollar-2cd6548d237>.

⁴⁶ See Joseph Young, *supra* note 43.

⁴⁷ See Stackexchange, *What is a DApp?*, <https://ethereum.stackexchange.com/questions/383/what-is-a-dapp>.

⁴⁸ See Etherscan.io, <https://etherscan.io/>

⁴⁹ See Joseph Young, *supra* note 43.

⁵⁰ See generally Dell’Erba, *supra* note 3.

⁵¹ See below.

⁵² See Dell’Erba, *supra* note 3, at 1121.

⁵³ See Justina Lee, *ICOs Are Turning Exclusive as Wealthy Investors Snatch Up Deals*, BLOOMBERG (Aug. 7, 2018), <https://www.bloomberg.com/news/articles/2018-08-08/token-sales-turn-exclusive-as-private-investors-snatch-up-deals>.

important financial institutions,⁵⁴ whereas ICOs and cryptocurrencies attracted relatively significantly large masses of unsophisticated investors.

B. The different categories of stablecoins

Three main categories of stablecoins have emerged in the market which use different models to stabilize their value. First, fiat-currency asset-backed stablecoins (so-called off-chain collateralized stablecoins) rely on fiat currencies as a collateral, and due to this characteristic cannot be fully decentralized. The most famous off-chain collateralized stablecoin is Tether, with a theoretical ratio of 1:1 between USDT (Tether's stablecoin) and the US dollar.⁵⁵ A more recent example of a fiat-backed stablecoin is StableUSD (USDS), issued by the venture-capital backed start-up Stably Inc.⁵⁶ According to the Stably's whitepaper (one of the most common explanatory documents in the world of blockchain startups), USDS is based on a centralized model "to fully back every token issued with an equivalent unit of real currency (i.e. US dollars) in a transparent reserve managed by Stably, Inc., the central issuer of USDS tokens, as well as our fiduciary custodial partners."⁵⁷

A second category of stablecoins, so-called on-chain collateralized stablecoins, is collateralized with digital assets, generally on one or a basket of cryptocurrencies. This category of stablecoins is fully decentralized. As the whitepaper of the decentralized stablecoin Havven explains, "A decentralised system cannot use collateral assets that exist outside the blockchain, as interfacing with these assets necessitates centralization with the aforementioned failure modes."⁵⁸ The full decentralization implemented with on-chain collateral would in principle be conducive to greater transparency. In the case of Havven, for example, an on-chain collateralization would enable "full transparency over how many tokens have been issued against the available collateral. This provides a solid basis for confidence in the solvency of the payment network built upon it."⁵⁹ According to Havven's whitepaper, its users transact directly in a price-stable cryptocurrency. Those who use the stablecoin pay fees to those who collateralize

⁵⁴ Steven Ehrlich, *Two Explanations For Venture Capital's Inexplicable Interest In Stablecoins*, FORBES (Sep. 25, 2018), <https://www.forbes.com/sites/stevenehrlich/2018/09/25/two-reasons-for-venture-capitals-inexplicable-interest-in-stablecoins/#7feef7321a57>. See also Chainalysis Team, *Bitcoin Investor and Speculator Hold Their Position Over The Summer* (Sep. 24, 2018), <https://blog.chainalysis.com/reports/money-supply-q3>.

⁵⁵ For further details, see part 3b.

⁵⁶ Stably Inc, <https://www.stably.io/>.

⁵⁷ Stably WhitePaper, <https://www.stably.io/static/whitepaper.pdf>.

⁵⁸ See Havven, Whitepaper, https://www.synthetix.io/uploads/havven_whitepaper.pdf.

⁵⁹ *Id.*

the network, compensating them for the risks of providing collateral and stability. Collateral providers control the money supply, and fees are distributed in proportion with each individual's stabilisation performance. Thus, Havven rewards suppliers of stability and charges those who demand it.⁶⁰

To implement this mechanism, Havven relies on a structure based on two different tokens. The first token, Nomin, with a floating supply, has a price measured in fiat currencies and should be a medium of exchange.⁶¹ The second token, Havven, should be the collateral for the system and have a static supply (as opposed to the floating supply of Nomin).⁶² According to the developers, the Havven token is a novel decentralized asset, whose value derives from the fees generated in the network it collateralizes.⁶³ In this way, the promoters aim to create "a form of representative money in which there is no requirement for a physical asset, thus removing the problems of trust and custodianship."⁶⁴ Havven's market capitalization "reflects the system's aggregate value," and "[o]wnership of havvens grants the right to issue a value of nomins proportional to the dollar value of havvens placed into escrow."⁶⁵

Non-collateralized stablecoins are a third category, implementing algorithmic tools to maintain the stability of stablecoins. As Robert Sams explains in a seminal paper, Bitcoin-like cryptocurrencies "govern the supply of coin through simple and deterministic coin growth rules."⁶⁶ For this reason, any unanticipated changes in coin demand impact the coin price, with the consequence that significant volatility limits their utility as media of exchange. Therefore, Sams proposed an alternative method of stabilization based on an elastic supply rule capable of adjusting the quantity of coin supply as a reaction to changes in coin market value.⁶⁷ Non-collateralized stablecoins are not backed by any form of collateral and instead are based on "self-sustaining models that incorporate additional layers of game-theoretic incentives to encourage self-interested user behavior that would be instrumental in sustaining the peg."⁶⁸ In this context, the role of a central bank managing the supply of fiat currencies is overtaken by smart contracts in charge of algorithmically expanding or

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² *Id.*

⁶³ *Id.*

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ Robert Sams, *A Note on Cryptocurrency Stabilisation: Seigniorage Shares*, BRAVE NEWCOIN (Apr. 28, 2015), <https://github.com/rmsams/stablecoins/blob/master/paper.pdf>.

⁶⁷ *Id.*

⁶⁸ See Bryanov, *supra* note 33.

contracting the supply of the stablecoin.⁶⁹ The majority of non-collateralized coins are based on a “seigniorage system” where two types of coin co-exist, one acting like money and one acting like shares: while the two coins share the same features, the two processes regulating their supply differ.⁷⁰ As Sams explains, in situations where coin supply has to be increased “coinbase is distributed to shareholders in exchange for a certain percentage of shares, which are destroyed (coin supply increases, share supply decreases).”⁷¹ When there is an opposite need to decrease the coin supply, “sharebase is distributed to coin holders in exchange for a certain percentage of coin, which are destroyed (coin supply decreases, share supply increases).”⁷² Such “shares-for-coin” and “coin-for shares” swap mechanism is voluntary, and it is implemented through a decentralized auction as programmed in the protocol.⁷³

Although recently shut down due to regulatory constraints (in particular the uncertainty on the applicability of the securities law to stablecoins),⁷⁴ the project of Basis is a useful example: it is built on two assets coexisting on the platform, proper stablecoins and supporting bonds. Should the coin’s price fall below a predetermined threshold, the system issues bonds to be sold to coin holders, attracted by the opportunity to be paid interest from the future coin issuance.⁷⁵ At the same time, the coins used to buy the bonds are destroyed, with the effect of reducing supply to consequentially lead an increase of the price.⁷⁶

Non-collateralized stablecoins enjoy the advantages of full decentralization and do not require the trust of the main issuing company.⁷⁷ A downside effect is the risk of such stablecoins being exposed to attacks that may potentially affect their price.⁷⁸ Furthermore, a structural critique resides in the expectation (or assumption) that non-

⁶⁹ *Id.*

⁷⁰ See Sams, *supra* note 66.

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.*

⁷⁴ Brady Dale, *Basis Stablecoin Confirms Shutdown, Blaming ‘Regulatory Constraints’*, COINDESK (Dec. 13, 2018), <https://www.coindesk.com/basis-stablecoin-confirms-shutdown-blaming-regulatory-constraints>.

⁷⁵ *Id.*

⁷⁶ *Id.*

⁷⁷ Blockshow, *Security Tokens Ecosystem in 2018: A Research by BlockShow*, MEDIUM (Nov. 22, 2018), <https://medium.com/@BlockShow/security-tokens-ecosystem-in-2018-a-research-by-blockshow-5641a2286ef7>

⁷⁸ *Id.*

collateralized stablecoins will grow indefinitely⁷⁹ and as a consequence will maintain their value.⁸⁰

In addition to these three main categories, two further categories of stablecoins may be identified: hybrid stablecoins and alternative stablecoins.⁸² Hybrid stablecoins combine both off-chain and on-chain mechanisms of stability. Reserve is an example of a hybrid stablecoin.⁸³ The Reserve network is based on three different phases: in the first centralized phase, Reserve is backed by US dollars held by a trust company; during the decentralized phase, Reserve is backed by a changing basket of assets in a decentralized way but still stabilized in price with respect to the US dollar; during the third “independent phase,” Reserve is no longer pegged to the US dollar, with the intent of stabilizing its real purchasing power regardless of fluctuations in the value of the dollar.⁸⁴

Alternative stablecoins are a residual category. An example of an alternative stablecoin is Terra, a cryptocurrency price-pegged to a basket of currencies, mirroring the composition of the Special Drawing Right (SDR) international asset reserve designed by the IMF⁸⁶.⁸⁷ In addition,

⁷⁹ See Barry Eichengreen, *Why 'stable coins' are no answer to bitcoin's instability* (Sep. 11, 2018), THE GUARDIAN, <https://www.theguardian.com/technology/2018/sep/11/stable-coins-bitcoin-cryptocurrencies-tether>.

⁸⁰ See Argon Group, *Stablecoins Explained*, MEDIUM (Mar. 15, 2018), <https://medium.com/@argongroup/stablecoins-explained-206466da5e61>.

⁸² See The Stablecoin Index, <https://stablecoinindex.com/projects>. The Stablecoin Index currently lists 11 Fiat-Collateralized Stablecoins (Tether-USDT, Trust Token – TrueUSD, Circle – USDC, Stably, AAA Reserve, X8X, Globcoin, Stasis, Stronghold, Gemini Dollar, Paxos Standard) 5 Crypto-Collateralized Stablecoins (Bitshares BitUSD, MakerDAO – DAI, Sweetbridge, Havven – NUSD, Augmint) 4 Algorithmic Supply Stablecoins (Basis, Fragments, Carbon Kowala), 3 Hybrid Stablecoin Models (Reserve, Saga, Aurora – Boreal), 3 Alternative Stablecoin Models (Phi, Stableunit, Terra Money, Celo), 2 Metal-backed Stablecoins (Digix Globa, HelloGold).

⁸³ See Reserve, <https://reserve.org/>.

⁸⁴ See Reserve Protocol, <https://reserve.org/protocol>.

⁸⁶ As the IMF explains, “The SDR is an international reserve asset, created by the IMF in 1969 to supplement its member countries’ official reserves. So far SDR 204.2 billion (equivalent to about US\$291 billion) have been allocated to members, including SDR 182.6 billion allocated in 2009 in the wake of the global financial crisis. The value of the SDR is based on a basket of five currencies—the U.S. dollar, the euro, the Chinese renminbi, the Japanese yen, and the British pound sterling”. The current basket includes U.S. dollar 41.73%, Euro 30.93%, Renminbi 10.92%, Japanese yen 8.33%, British pound 8.09%. Source: International Monetary Fund. See IMF, *Special Drawing Right (SDR)* (Apr. 19, 2018), <https://www.imf.org/en/About/Factsheets/Sheets/2016/08/01/14/51/Special-Drawing-Right-SDR>.

⁸⁷ See Terra White Paper, https://terra.money/static/Terra_White_paper.pdf

the basket may also include “basic goods and services with worldwide usage and appeal such as gold, corn, and timber.”⁸⁹

Finally, while the vast majority of stablecoins are pegged to the US dollar, some are pegged to metals. An example is Digix, where one DGX represents one gram of gold on Ethereum.⁹⁰

In addition to the distinctive stabilizing mechanism, stablecoins do not depend on any national central bank, aspiring to be truly global currencies, like any other traditional cryptocurrency. The two “key promises” of being stable and global should be the preconditions for the implementation of cryptocurrencies on a broader scale in daily life, due to increased opportunities for practical usage.⁹¹

C. Stablecoins’ role in cryptoeconomics

A new phase of infrastructural initiatives has emerged in the blockchain ecosystem. An important pillar of this infrastructural evolution is the debate on smart contracts and their functional implementations in different contexts. A major area is corporate governance, with the possibility for corporations based in Delaware and Wyoming to issue so-called electronic shares on a distributed ledger, and the consequent discussions to implement a more reliable proxy voting system executed on the blockchain.⁹² A further relevant implementation of blockchain is the one for market infrastructures, in both the trading and post-trading phases, such as cryptoexchanges and clearinghouses. In addition, new self-regulatory initiatives represent the effort to design a healthy regulatory infrastructure.⁹³ Stablecoins may be considered part of this broader ecosystem of initiatives and represent “a form of infrastructure or foundational layer for crypto assets”⁹⁴ that may contribute to the substitution of opaque and inefficient platforms and assets, improving the transparency and the regulatory compliance of the coming structures.⁹⁵ In such a more mature environment, it is not surprising that companies like Fidelity, ICE (New York Stock Exchange Group), NASDAQ, Microsoft, Starbucks and some Ivy League endowment funds have increasingly shifted their attention toward

⁸⁹ See Terra White paper, *supra* note 84.

⁹⁰ See Digix, <https://digix.global/>.

⁹¹ Sherman Lee, *supra* note 35.

⁹² See Broadridge, *How Blockchain Transforms Proxy Voting* (Apr. 24, 2018), <https://www.broadridge.com/video/how-blockchain-transforms-proxy-voting>.

⁹³ See Aaron Stanley, *Just In Time? Winklevoss-Backed Crypto Self-Regulatory Effort Picks Up Steam*, FORBES (Aug. 20, 2018), <https://www.forbes.com/sites/astanley/2018/08/20/just-in-time-winklevoss-backed-crypto-self-regulatory-group-has-liftoff/#663aa2092ea5>.

⁹⁴ See Blockchain, *supra* note 23, 7.

⁹⁵ Joseph Young, *supra* note 43.

blockchain initiatives, venturing new significant initiatives or indirectly investing in the “crypto-ecosystem.”⁹⁶

From a theoretical perspective, stablecoins should help cryptocurrencies serve the fundamental purposes of currencies, i.e. serving as a store of value and at the same time as a medium of exchange and a unit of account.

While Bitcoin was considered useful both for storing value as well as a medium of exchange,⁹⁷ the expectation of continuous growth in the value of Bitcoin and the spectacular growth (and fall) of other alt-coins encouraged the trend of holding these assets for speculative purposes. In the context of volatility, people have an incentive to keep cryptocurrencies in view of an appreciation in value rather than circulating them.⁹⁸ Therefore, the creation of stable cryptocurrencies as a medium of exchange would contribute to their widespread adoption,⁹⁹ unlocking mass-adoption for day-to-day businesses and recurrent payments. Nowadays, cryptocurrencies’ volatility would generate uncontrolled risks for those businesses accepting them. Stablecoins may prove useful in increasing the degree of certainty, in particular for short-term cash reserves and revenues.¹⁰⁰ Stability has the potential to cut off purely speculative activity, making them better suited to be used as a means of exchange. Cryptocurrencies with daily fluctuations of 10–20% due to speculative maneuvers cannot serve as a means of exchange.¹⁰¹

Complementary to their function as a medium of exchange, stablecoins may also serve as a unit of account. In the short term, stablecoins may serve as a digitized unit of account by being pegged to national units of account, while in the long term, they may become independent units of account.¹⁰² Furthermore, stablecoins may serve as a more reliable performance measurement to better analyze the intrinsic value of a project, separating it from the fluctuations of any

⁹⁶ Hu Liang, *The Intrinsic Value of Crypto (What the Bubble Hasn’t Changed)*, *Supra* note.

⁹⁷ However, *see* Yermack, *supra* note 21. After considering that money is generally defined by economists for serving three purposes (i.e. functioning as a medium of exchange, a unit of account, and a store of value), the author concludes that “Bitcoin somewhat meets the first of these criteria, because a growing number of merchants, especially in online markets, appear willing to accept it as a form of payment”, although it represents a minuscule part of global commerce; furthermore it poorly serves as a store of value and medium of exchange, due to very high time series volatility”.

⁹⁸ Patrick Tan, *Security Tokens Versus Stablecoins*, MEDIUM (Sep. 27, 2018), <https://medium.com/predict/security-tokens-versus-stablecoins-2d33b91e2fd>.

⁹⁹ *Id.*

¹⁰⁰ Blockchain, *supra* note 23, 12. As the Report emphasizes, “Transacting in ether or bitcoin would make the role of a treasurer a difficult task as the business’s runway (how long the company can survive if income and expenses stay constant) could adversely shift in an instant due to unfavorable market swings”.

¹⁰¹ *See* Argon Group, *supra* note 78.

¹⁰² *Id.*

cryptocurrency,¹⁰³ and if pegged to inflation, stablecoins would not require any adjustment to historical data.¹⁰⁴ Finally, stablecoins' stability would enable the denomination of trading pairs in US dollars instead of classic cryptocurrencies, such as Bitcoin or Ether, enabling exposure to fiat rates (other than Bitcoin or Ether), while creating new arbitrage opportunities.¹⁰⁵

At the same time, stablecoins may serve as a store of value, useful for typical financial operations, in particular for hedging purposes over the long term and for the implementation of a systematic tokenization of real-world assets. With regard to hedging, a stable reserve of liquid assets would be helpful for miners to cover fixed and variable costs related to the activity of mining cryptocurrencies with their computing resources.¹⁰⁶ Furthermore, stablecoins may benefit founding teams launching an ICO; by retaining their funds in Ether, entrepreneurs may be exposed to a bear market with falling prices, with the obligation to fulfill investor expectations with decreasing capital available.¹⁰⁷ Tokenization, the digitized version of real-world assets, may involve \$256 trillion of real-world assets¹⁰⁸ and has already started to be implemented in real estate, commodities, securities and fine art.¹⁰⁹ To be effective, tokenization requires a "definitive store of value," such as a "stablecoin which is consistently audited," capable of offering "guarantees over the underlying assets with full collateral and possess legal consequences for bad actors and remunerations to affected parties"¹¹⁰ It is questionable whether it is realistic to expect that a cryptocurrency, namely a stablecoin, may have all these characteristics.

Stablecoins may contribute to solve the practical difficulties of circulating dollars in the cryptocurrency world in different ways. For exchanges that cannot or do not deal in dollars, stablecoins are an easy substitute to fiat currencies in particular dollars.¹¹¹ For this reason, stablecoins may be beneficial for investors or traders, as well as exchanges. By using a fiat currency substitute, investors and traders can much more easily liquidate a position in Bitcoin operating on an exchange not dealing in fiat currencies, opting for a cryptocurrency with stable prices, which would be equivalent to selling that position in Bitcoin for

¹⁰³ *Id.*

¹⁰⁴ *Id.*

¹⁰⁵ Sexer, *supra* note 19.

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*

¹⁰⁸ See Credit Suisse, Global Wealth Report 2018, <https://www.credit-suisse.com/corporate/en/research/research-institute/global-wealth-report.html>

¹⁰⁹ See Blockchain Board of Derivatives, *Fundamental Analysis: TrueUSD (TUSD)*, BLOCKCHAIN BOARD OF DERIVATIVES (BBOD) BLOG (Feb. 4, 2019), <https://blog.bbod.io/fundamental-analysis-trueusd-tusd/>.

¹¹⁰ *Id.*

¹¹¹ Cryptocurrency Facts, *supra* note 32.

cash. In addition, stablecoins may grant liquidity to exchanges, with benefits for the entire cryptocurrency market.¹¹² Last August, according to a report by Chainalysis, 32% of the total outstanding supply of Bitcoin, equal to 4.8 million Bitcoin, was held in personal wallets with some activity since August 31; 6.3 billion Bitcoin were inactive investments, held in accounts with no activity for a year.¹¹³ On this basis, unsurprisingly, cryptocurrency exchanges have been increasingly adding stablecoins to their platforms.¹¹⁴

Liquidity concerns led venture capitalists to invest in stablecoins. Many ICOs, either in a preliminary stage or exclusively, were directed to accredited investors or institutional investors,¹¹⁵ in particular venture capitalists (who played an important role in blockchain)¹¹⁶ via private sales or private pre-sales.¹¹⁷ Stablecoins may be helpful for venture capitalists because, instead of keeping wallets with multiple utility tokens, each of which is used for a specific application, venture capitalists have the alternative to “hold most of [their] money in a stablecoin and exchange it for the required token.”¹¹⁸

In addition to liquidity concerns, stablecoins may be disruptive in the banking market by acting as a bank disintermediators. Bank disintermediation is a phenomenon that has existed since the 1970s¹¹⁹ and generally refers to corporations that obtain funding from sources other than banks, whether funding is provided from non-bank lenders or by issuing bonds. By extending the concept of banking disintermediation to “retail” banking transactions, stablecoins may be disruptors in this field. Stablecoins’ long-term potential to display the function of retail banks and monetary systems has attracted the attention of institutional investors, not

¹¹² *Id.*

¹¹³ See Ehrlich, *supra* note 53. See also Chainalysis Team, *Bitcoin Investor and Speculator Hold Their Position Over The Summer*, CHAINANALYSIS BLOG (Sep. 24, 2018), <https://blog.chainalysis.com/reports/money-supply-q3>.

¹¹⁴ See Ana Alexandre, *Report: Stablecoins See Significant Growth in Adoption Over Recent Months*, COINTELEGRAPH (Dec. 11, 2018), <https://cointelegraph.com/news/report-stablecoins-See-significant-growth-in-adoption-over-recent-months>.

¹¹⁵ See Ehrlich, *supra* note 53.

¹¹⁶ See Dell’Erba, *supra* note 3, at 1121.

¹¹⁷ See Justina Lee, *ICOs Are Turning Exclusive as Wealthy Investors Snatch Up Deals*, Bloomberg (Aug. 7, 2018), <https://www.bloomberg.com/news/articles/2018-08-08/token-sales-turn-exclusive-as-private-investors-snatch-up-deals>

¹¹⁸ See Ehrlich, *supra* note 53.

¹¹⁹ See C.K. Whitehead, *The Evolution of Debt Covenants, the Credit Market, and Corporate Governance*, J. CORP. L. 654 (2008-2009).

only venture capitals but also established financial institutions, such as Goldman Sachs,¹²⁰ interested in pursuing a strategy as a local banker.¹²¹

In a function that is complementary to “classic” banking service, stablecoins may be important to strengthen the payment system. Indeed, the European Banking Authority (EBA) includes them under the category of payment/exchange/currency tokens, as distinguished from “investment tokens” and “utility tokens,” after underlying the lack of a common taxonomy in use by international standard-setting bodies.¹²³ Although in September 2017 JP Morgan’s CEO, Jamie Dimon, was very critical of Bitcoin, publicly stating that it was fraud¹²⁴, JP Morgan became increasingly active in this space. Firstly, it created Quorum, a strategic blockchain-based infrastructure, with the function of tokenizing gold bars in an effort “to allow sustainable miners to earn a premium on global markets” as part of a broader mission to manage global liquidity, improve information inefficiencies and create “crypto assets.”¹²⁵ Secondly, JP Morgan was reported to have launched the first ever cryptocurrency created by a bank, a USD-backed stablecoin, the “JPM Coin,” with the ambition to “instantly settle transactions between clients of its wholesale payments business.”¹²⁶ The nature of the JPM Coin is unclear, since it does not share key characteristics with traditional cryptocurrencies; in fact, it will run on a private blockchain, with the coins issued directly by the bank, as opposed to cryptocurrencies running on public blockchain where entrepreneurs generally launch their ICOs.¹²⁷

In addition to credit institutions, even social media companies may play a role in the banking system¹²⁸, and stablecoins may make these

¹²⁰ *Id.*

¹²¹ Liz Hoffman and Peter Rudegeair, *Goldman Sachs, Adviser to the Elite, Wants to Be Your Local Bank*, WALL. ST. J. (Feb. 27, 2018), <https://www.wsj.com/articles/goldman-sachs-adviser-to-the-elite-wants-to-be-your-main-street-banker-1519745369>.

¹²³ EBA, *Report on Crypto assets* (Jan. 9, 2019), <https://eba.europa.eu/documents/10180/2545547/EBA+Report+on+crypto+assets.pdf>.

¹²⁴ Michael Patterson, *Jamie Dimon Vindicated? Bitcoin’s Back to Where He Cried ‘Fraud’* (Nov. 20, 2018), Bloomberg, <https://www.bloomberg.com/news/articles/2018-11-20/jamie-dimon-vindicated-bitcoin-s-back-to-where-he-cried-fraud>.

¹²⁵ James Eyers, *JP Morgan’s Quorum blockchain opens new world of trading opportunities* (Oct. 29, 2018), Financial Review, <https://www.afr.com/technology/jp-morgans-quorum-blockchain-opens-new-world-of-trading-opportunities-20181027-h176fs>.

¹²⁶ Hugh Son, *JP Morgan is rolling out the first US bank-backed cryptocurrency to transform payments business*, CNBC (Feb. 13, 2019), <https://www.cnbc.com/2019/02/13/jp-morgan-is-rolling-out-the-first-us-bank-backed-cryptocurrency-to-transform-payments-.html>.

¹²⁷ See Hankin, *supra* note 41.

¹²⁸ See Hannah Murphy & Philip Stafford, *Facebook held talks with Winklevoss twins over new currency*, FT (May 23, 2019), <https://www.ft.com/content/0207778c-7d62-11e9-81d2-f785092ab560>.

market transformations much easier. Facebook announced the creation of a crypto-currency based payment system, Libra, and planned its launch for the first half of 2020,¹²⁹ with the support of 28 founding members, including Visa, Mastercard, Paypal, Uber, Lyft and Coinbase.¹³⁰ This payment system would enable its users to send money to each other and to purchase goods on Facebook, Instagram and WhatsApp as well as across the internet and the real world. Although Libra's whitepaper does not refer to the concept of stablecoins, Libra may resemble to a stablecoin.¹³¹ Consistent with other stablecoins existing in the market, Libra is backed by "backed by a collection of low-volatility assets, such as bank deposits and short-term government securities in currencies from stable and reputable central banks".¹³² Furthermore, a network of investment-grade credit rating custodians based all over the world implements a secure a decentralized system for holding these assets.¹³³ As a consequence, Libra's key characteristics may be an extremely high liquidity and tradability,¹³⁴ as well as the promise of a low volatility.¹³⁵ In addition, Libra promoters emphasize the potential of this initiative in reaching a significant number of adults who are "unbanked", promoting financial inclusion in developing countries lacking access to credit, and cutting the costs involved in immigrants' remittances.¹³⁶

Finally, stablecoins may enable further implementations where stability is highly desirable. For smart contracts, stablecoins are a better option than more volatile cryptocurrencies.¹³⁷ One of the most important and profitable areas would be the growing sector of so-called smart insurance; "smart travel insurance" is an area that attracted the interest of a giant company like AXA.¹³⁸

¹²⁹ See Libra, White Paper, <https://libra.org/en-US/white-paper/>.

¹³⁰ Zack Seward & [Nikhilesh De](#), *Facebook Unveils Libra Cryptocurrency, Targeting 1.7 Billion Unbanked* (Jun. 18, 2019), Coindesk, <https://www.coindesk.com/facebook-launches-subsiidiary-to-support-new-libra-crypto>.

¹³¹ See Laura Noonan & Hannah Murphy, Facebook in talks with US regulator over digital currency (Jun. 2, 2019), <https://www.ft.com/content/3b2084fe-83c6-11e9-b592-5fe435b57a3b>.

¹³² See Libra, *supra* note 129.

¹³³ *Id.*

¹³⁴ See Murphy & Stafford, *supra* note 131.

¹³⁵ See Libra, *supra* note 129: one Libra will not always be able to convert into the same amount of a given local currency (i.e., Libra is not a "peg" to a single currency). Rather, as the value of the underlying assets moves, the value of one Libra in any local currency may fluctuate. However, the reserve assets are being chosen to minimize volatility, so holders of Libra can trust the currency's ability to preserve value over time.

¹³⁶ See Seward & [De](#), *supra* note 130.

¹³⁷ See Blockchain, *supra* note 23, at 8.

¹³⁸ *Id.*

III. CRITICAL CONSIDERATIONS

A. Collateral and issues related to each category of stablecoins

The label “stablecoin” identifies a specific group of cryptocurrencies pursuing the goal of stability, according to the respective whitepapers. Thus far, experiments with stablecoins have failed¹³⁹ or have been traded for less than \$1. This is the case for Nubits, traded for \$0.50 in late March 2018,¹⁴⁰ or the recent case of the more established stablecoin Tether, which traded at \$0.96.¹⁴¹ Furthermore, although an indirect benefit of stablecoins should lead to an increased stability of the cryptocurrencies, there are no empirical studies proving that this is the case.¹⁴² On the contrary, stablecoins may be a further conductor of volatility due to the increased opportunities for speculation.¹⁴³

An attempt to try to answer the question of whether stablecoins lead to increased stability should necessarily start with analyzing the fragility of each type of stablecoin. As already mentioned in Part 2c, the word “stablecoin” encompasses a broad range of cryptocurrencies that do not share many common characteristics, in particular the most crucial, i.e. the use of collateral. In the aftermath of the financial crisis in 2008, the lack of an adequate level of collateral raised significant concerns among regulators. Important regulations requiring increased high-quality collateral are the result of a post-crisis approach aimed at tackling systemic risk¹⁴⁴ and reducing the risks of contagion, in an effort to increase financial stability. Key pillars of these regulatory architectures are the regulations of derivatives and clearing-houses,¹⁴⁵ where collateral reduces the so-called counterparty risk, and the capital ratios provided by the Basel III Agreements and its implementing rules, such as the Capital

¹³⁹ See Preston Byrne, Stablecoins are doomed to fail (Dec. 10, 2017), <https://prestonbyrne.com/2017/12/10/stablecoins-are-doomed-to-fail/>

¹⁴⁰ Cryptocurrency Facts, *supra* note 32.

¹⁴¹ Marie Huillet, *Tether Tanks as Traders ‘Lose Trust,’ Other Cryptos See Price Boost* (Oct. 15, 2018), <https://cointelegraph.com/news/tether-tanks-as-traders-lose-trust-other-cryptos-see-price-boost>.

¹⁴² *Id.*

¹⁴³ *Id.*

¹⁴⁴ For a definition of systemic risk see generally Steven L. Schwarcz, *Systemic Risk*, 97 GEORG. L. J. (2008). See also generally Rosa Lastra, CAPITAL MARKETS LAW JOURNAL, Vol. 6 Issue 2 (2011).

¹⁴⁵ The 2008 G20 in Washington, Declaration of the Summit on Financial Markets and the World Economy, mandated national regulators to “Strengthening the resilience and transparency of credit derivatives markets and reducing their systemic risks, including by improving the infrastructure of over-the-counter markets”. The European Market Infrastructure Regulation for example implements this mandate.

Requirements Regulation¹⁴⁶ and Capital Requirements Directive IV¹⁴⁷ in Europe.

However, an automatic association between stablecoins and collateral would be inappropriate. The perception that a significant advancement induced by stablecoins (in particular, those collateralized with fiat currencies) would be the association of the notion of collateral with the world of cryptocurrencies is erroneous. Except for collateralized stablecoins, the existence of collateral is not a distinctive feature of stablecoins as opposed to other traditional cryptocurrencies. As discussed in Part II, two different mechanisms of stabilization have emerged: stabilization via a collateral (fiat currencies or cryptocurrencies), and an algorithmic stabilization mechanism that does not require any collateral. Algorithmic (non-collateralized) stablecoins are based on a self-sustaining smart-contract framework that manages the supply of stablecoins. In this case, the only difference from traditional cryptocurrencies lies in this algorithmic mechanism designed to provide stabilization, but there is no collateral in either case. Therefore, except for this designing feature, stablecoins do not provide any additional guarantee in comparison to traditional cryptocurrencies and probably do not represent a step forward. It is not surprising that in the short-term, asset-backed stable coins (both off-chain and on-chain) outperformed algorithmic coins.¹⁴⁸

Off-chain fiat-backed stablecoins should be, in principle, more reliable due to the “real” high-quality collateral as a guarantee of stability. A structural contradiction of off-chain stablecoins, however, may be the existence of the centralized authority of those who issue the tokens. This structural contradiction is not easy to solve and is not limited exclusively to stablecoins. Indeed, it is common to many situations involving the implementation of blockchain, including, among others, corporate voting. More generally, this contradiction is not surprising, and characterizes almost all the networks, including internet.¹⁴⁹ In the context of stablecoins, the implementation of a permissioned blockchain to better manage the proxy voting system would require a “centralized” intermediary acting as a gatekeeper. Tether and Stably are examples of “centrally governed” cryptocurrencies where users have to trust the

¹⁴⁶ REGULATION (EU) No 575/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012.

¹⁴⁷ DIRECTIVE 2013/36/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC.

¹⁴⁸ See Blockchain, The State Of Stablecoins (Sep. 2018), <https://www.blockchain.com/research>.

¹⁴⁹ See generally Kevin Werbach, *The Centripetal Network: How the Internet Holds Itself Together, and the Forces Tearing it Apart*, 42 UC DAVIS L. REV. (2009).

issuing company with no guarantee of “any right of redemption or exchange of Tethers for money.”¹⁵⁰ As a consequence, off-chain stablecoins rely on the same paradigm of a centralized network, perpetuating the traditional centralized concept/framework of “trust” in a third party. Indeed, stablecoins require users to trust in a central third party.¹⁵¹

However, this centralization is not counterbalanced by effective transparency about the effective existence of the collateral, helpful for the individual investors and the overall market. Similar to what happened in the context of ICOs (in particular when their new wave started), this lack of transparency mostly depends on an endemic lack of external auditing, useful to adequately prove entrepreneurs’ good faith and adequate technical background. While this may apply to all the categories of stablecoins, a specific auditing for off-chain and on-chain collateralized stablecoins would be essential to prove to investors and the market the real existence and the consistency of the collateral secured at a custodial entity. For Tether, there is no third-party audit of the entity claiming that Tethers are guaranteed by a collateral equal to one US dollar per coin.¹⁵² In fact, although Tether was linked to the US dollar at a 1:1 ratio,¹⁵³ significant concerns emerged about the existence and real consistency of fiat currency collateral.¹⁵⁴ As a consequence, Tether was traded at around \$0.96.¹⁵⁵ Therefore, these fiat-backed cryptocurrencies have problems of transparency that also impact the costs side, encompassing high fees and delays originated by inefficiently managed peaks of demand.¹⁵⁶ Tether has been compared to a “Ponzi scheme”, since its functioning depends on the growth of the platform which is not guaranteed.¹⁵⁸ As Eichengreen explains,

To issue one dollar’s worth of Tether to you or me, the platform must attract one dollar of investment capital from

¹⁵⁰ See Bryanov, *supra* note 33.

¹⁵¹ See Eichengreen, *supra* note 80.

¹⁵² *Id.*

¹⁵³ Gareth Jenkinson, Untethered: The History of Stablecoin Tether and How It Has Lost Its \$1 Peg (Oct. 17, 2018), <https://cointelegraph.com/news/untethered-the-history-of-stablecoin-tether-and-how-it-has-lost-its-1-peg>

¹⁵⁴ Andrea Tan, Benjamin Robertson, and Matthew Leising, Why Crypto Traders Are So Worried About Tether (Oct. 14, 2018), https://www.bloomberg.com/news/articles/2018-10-14/why-crypto-traders-are-so-worried-about-tether-quicktake-q-a?utm_source=twitter&utm_content=crypto&utm_medium=social&utm_campaign=socialflow-organic

¹⁵⁵ Marie Huillet, Tether Tanks as Traders ‘Lose Trust,’ Other Cryptos See Price Boost (Oct. 15, 2018), <https://cointelegraph.com/news/tether-tanks-as-traders-lose-trust-other-cryptos-see-price-boost>

¹⁵⁶ See Sexer, *supra* note 19.

¹⁵⁸ See Jason Bloomberg, Bernie Madoff Move Over: ‘Stablecoins’ Have You Beat (Nov. 25, 2018), *Forbes*, <https://www.forbes.com/sites/jasonbloomberg/2018/11/25/bernie-madoff-move-over-stablecoins-have-you-beat/#6c8a84f7dab1>

you or me, and place it in a dollar bank account. One of us then will have traded a perfectly liquid dollar, supported by the full faith and credit of the U.S. government, for a cryptocurrency with questionable backing that is awkward to use.¹⁶⁰

In the case of off-chain backed stablecoins, this problem is coupled with the specific need of tracing off-chain operations involving fiat currencies. The newly created stablecoin USDS not only promises a regular third-party audit but also that “token issuance/redemption transactions are recorded on-chain and all off-chain transactions as well as reserve balances will be broadcasted to the public at frequent intervals.”¹⁶¹ In addition, referring specifically to off-chain fiat transactions and their gap of transparency, Stably promises to “create and submit their hashes to the blockchain for later verification during audits”;¹⁶² to make publicly available on its website all the transactions and bank balances and to provide a link to publicly available transactions on the blockchain; and to “employ a reputable third-party audit firm (TBA) to conduct scheduled audits and attestations [on a monthly basis] for our reserve accounts and off-chain transactions,” posted on the website when available.¹⁶³

Further issues may emerge if fiat-backed stablecoins collapse, with users exposed to specific counterparty and third-party risks. In this context, counterparty risk relates to the problem of trusting the good will of the central managers of the money, while third-party risk depends on outside actors, who may be a threat to users (hackers or governments).¹⁶⁴

For digital asset-backed stablecoins, major problems depend on the digital assets on which the stablecoin is collateralized. Digital asset-backed stablecoins are generally collateralized by other cryptocurrencies or a basket of them. In this context, a major risk is represented by the “collateral volatility.” For example, a stablecoin like Dai was criticized because of the over-collateralization with ETH, exposing Dai’s users to the value (and the volatility) of the underlying coin.¹⁶⁵

Non-collateralized stablecoins may be weak because they are based on the expectation that the platform will constantly grow, which may not be a realistic guarantee.¹⁶⁶ In addition, under specific conditions

¹⁶⁰ See Eichengreen, *supra* note 79.

¹⁶¹ Stably White Paper, *supra* note 56.

¹⁶² *Id.*, 9.

¹⁶³ *Id.*, 9.

¹⁶⁴ See Bryanov, *supra* note 33.

¹⁶⁵ See Preston Byrne, *Stablecoins are doomed to fail*, <https://prestonbyrne.com/2017/12/10/stablecoins-are-doomed-to-fail/>. For a different view, see Reserve Research Team, Reserve’s Analysis of the MakerDAO Protocol (Aug. 13, 2018), <https://medium.com/reserve-currency/our-analysis-of-the-makerdao-protocol-4a9872c1a824>

¹⁶⁶ Barry Eichengreen, *supra* note 79.

“the peg is likely to fail irrevocably”¹⁶⁷; as research reveals, although Basis states to implement “on-chain” stabilization, implying a complete decentralization, “their actual plan involves a period of stabilization using off-chain assets,” with the consequence of potentially significant financial distress, as in the case of Tether.¹⁶⁸ As the research explains,

“Basis will be backed by at most 80% funding, and has made no commitments to spend that money defending the peg. Even if off-chain stabilization works when Basis’s market cap is small enough, its cash reserves solution won’t scale. This is particularly bad because Basis’s stabilization mechanism only works if investors are confident in both a stable peg and growth. In fact, confidence is most needed during a peg break, when it is least likely to be present. With fiat currency, confidence in exchange-rate pegs is established by demonstrating assets held in reserve to back the peg. Because Basis’s reserves are a function of current market demand and confidence, they are illegible and unreliable, further contributing to the potential downward spiral of value loss and lack of confidence.”¹⁶⁹

Furthermore, how can auditors effectively assess whether an algorithmic stabilization mechanism is adequate or not? This is similar to a problem that occurred in the context of private funds, in particular hedge funds: investment strategies and exposures were so complex that it was almost impossible for an external auditor to understand them and make any prediction in relation to liquidity and counterparty risks.

B. The financial relationship between stablecoins and other cryptocurrencies

Blockchain has the characteristic of being an ecosystem. As a consequence, a cryptocurrency’s market value is (and will probably be) always coordinated. In addition, Bitcoin, which still is the most capitalized cryptocurrency, operates as a sort of benchmark for the other cryptocurrencies, and its interconnectedness with other cryptocurrencies is further promoted by the fact that many small cryptocurrencies are exchanged against Bitcoin. In such a context, stablecoins that are pegged to fiat currencies and may benefit from the existence of collateral may contribute to break this interconnectedness between cryptocurrencies and, in particular, cryptocurrencies’ dependence on Bitcoin.

In addition to financial implications, the interconnectedness between cryptocurrencies (including stablecoins) and Bitcoin also has transparency implications. A close analysis of the prices in the period

¹⁶⁷ Nevin Freeman, *Reserve’s Analysis of the Basis Protocol*, MEDIUM (May 14, 2018), <https://medium.com/reserve-currency/our-analysis-of-the-basis-protocol-cf1e0713b849>.

¹⁶⁸ *Id.*

¹⁶⁹ *Id.*

from March to December 2017 reveals a close relationship between Tether and Bitcoin, with Tether significantly contributing to the Bitcoin bubble.¹⁷⁰ Tether was able to exploit a monopoly situation in 2017 and a factual predominance in 2018, although multiple stablecoins projects emerged and were implemented. In such a context, this monopoly situation led to an influence of Bitcoin market price in the different cryptoexchanges, compounded by the fact that the company issuing Tether was de facto controlled by Bitfinex, the biggest Asian cryptoexchange.¹⁷¹ A correlation between the market price of Bitcoin and other cryptocurrencies in the “pump phase” of the bubble and the offering of Tether on the exchanges was observed; therefore, a plausible conclusion would be that Bitfinex may have artificially induced the buying of the cryptocurrencies with growing amounts of Tether.¹⁷² In a phase of exponential rise in price, this strategy is a way to “issue” Tether with no adequate coverage in dollars to buy digital currencies and resell them at a higher price reconstituting the reserves.¹⁷³

This leads to some consideration of the relationship between stablecoins’ issuers and cryptoexchanges. As briefly mention in Part II b, stablecoins may grant liquidity to exchanges.¹⁷⁴ Cryptoexchanges may be in a position of significant conflict of interest when deciding to list stablecoins, due to the advantages and the profits that they may extract from transactions involving the conversion of fiat versus cryptocurrencies and vice versa, requiring the implementation of stablecoins. This also provides an explanation for the reason why cryptoexchanges have been increasingly adding stablecoins to their platforms.¹⁷⁵

Further doubts on the dangerous relationship between stablecoins and cryptoexchanges are casted by the recent allegations involving the exchange Bitfinex and its owned stablecoin Tether, against whom the NY Attorney General issued subpoenas in November 2018.¹⁷⁶ As the filings explain:

¹⁷⁰ See Marcello Minenna, *L'esplosione della bolla Bitcoin: un'autopsia*, IL SOLE 24 ORE (Dec. 31, 2018), <https://www.ilsole24ore.com/art/commenti-e-idee/2018-12-30/l-esplosione-bolla-bitcoin-autopsia-154252.shtml?uuid=AEGaGD7G>

¹⁷¹ *Id.*

¹⁷² *Id.*

¹⁷³ *Id.*

¹⁷⁴ Cryptocurrency Facts, *supra* note 32.

¹⁷⁵ See Ana Alexandre, *Report: Stablecoins See Significant Growth in Adoption Over Recent Months*, COINTELEGRAPH (Dec. 11, 2018), <https://cointelegraph.com/news/report-stablecoins-See-significant-growth-in-adoption-over-recent-months>.

¹⁷⁶ Leticia James, *Attorney General James Announces Court Order Against “Crypto” Currency Company Under Investigation For Fraud* (Apr. 25, 2019), <https://ag.ny.gov/press-release/attorney-general-james-announces-court-order-against-crypto-currency-company-under>.

Bitfinex no longer has access to over \$850 million dollars of co-mingled client and corporate funds that it handed over, without any written contract or assurance, to a Panamanian entity called “Crypto Capital Corp.,” a loss Bitfinex never disclosed to investors. In order to fill the gap, executives of Bitfinex and Tether engaged in a series of conflicted corporate transactions whereby Bitfinex gave itself access to up to \$900 million of Tether’s cash reserves, which Tether for years repeatedly told investors fully backed the tether virtual currency “1-to-1. ... Bitfinex has already taken at least \$700 million from Tether’s reserves. Those transactions – which also have not been disclosed to investors – treat Tether’s cash reserves as Bitfinex’s corporate slush fund, and are being used to hide Bitfinex’s massive, undisclosed losses and inability to handle customer withdrawals.¹⁷⁷

Such a situation raises questions about the opportunity for an exchange to “own” a stablecoin and to list it, and imposes further thoughts (and potentially actions) on the regulatory side. These actions should serve to reduce conflicts of interests, while enhancing the essential role of exchanges and protecting stablecoins’ collateral. This would contribute to safeguarding market integrity and enhancing investor protection in the context of cryptoeconomics.

C. The qualification of stablecoins under securities law

Cryptocurrencies and ICOs have drawn the attention of securities regulators in the United States and Europe. Despite their name and their function within the market, stablecoins may still qualify as a deposit, e-money¹⁷⁸, as well as securities or commodities and trigger new regulatory uncertainties about their classification, as ICOs and cryptocurrencies have.¹⁷⁹ Furthermore, stablecoins may raise traditional compliance issue issues related to Anti-Money Laundering (AML) and Know Your Customer (KNY) rules. This section focuses on the qualification of stablecoins as securities and commodities under the US and European law.

¹⁷⁷ *Id.*

¹⁷⁸ See Ben Regnard-Weinrabe, Heenal Vasu, and Hazem Danny Al Nakib, Stablecoins (Feb. 10, 2019), Harv. Corp. Gov. F., <https://corpgov.law.harvard.edu/2019/02/10/stablecoins/>

¹⁷⁹ See Dell’Erba, *supra* note 3. See also Dell’Erba, *supra* note 9.

1. United States

In the United States, the same regulatory uncertainties on the classification of ICOs and cryptocurrencies that existed in 2017–2018¹⁸⁰ may re-emerge in the context of stablecoins. The recent decision of Basis’s developers to shut down operations exemplifies this regulatory uncertainty¹⁸¹ and its potentially negative consequences. Consistent with what happened for ICOs, the Securities and Exchange Commission (SEC) may qualify stablecoins not as cryptocurrencies but rather as “securities”, due to their affinities with the concept of “security token”: a security token is backed by something tangible, including assets, profits or revenue of the company.¹⁸² As a consequence, the SEC would be tempted to extend the securities law framework to this class of cryptoassets. After a period of inactivity,¹⁸³ in July 2017 the SEC issued the Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934, the DAO¹⁸⁴ (the “DAO Report”). In that case, the SEC applied a classic tool elaborated on by American courts, the so-called “Howey” test, to ICO tokens and concluded that DAO ICO tokens qualified as a “security” under § 2(a)(1) of the Securities Act of 1933.¹⁸⁵ Since then, the SEC gradually extended the securities regulation to ICOs and a vast majority of activities involving cryptocurrencies.¹⁸⁶

Under American securities law, § 2(a)(1) of the Securities Act of 1933 provides a definition of “security”. Section 2(a)(1) of the Securities

¹⁸⁰ See Dell’Erba, *supra* note 3. See also Dell’Erba, *supra* note 9.

¹⁸¹ Michael Del Castillo, *Crypto’s Top Funded Startup Shuttles Operations Following SEC Concerns*, FORBES (Dec. 13, 2018), <https://www.forbes.com/sites/michaeldelcastillo/2018/12/13/sec-rules-kill-cryptos-top-funded-startup/#485ac2f22918>.

¹⁸² Polimath, *What Is A Security Token Offering (STO)?* (Mar. 12, 2018), <https://blog.polymath.network/what-is-a-security-token-offering-sto-4e5a92bf6bca>. See also Josya Wilmoth, *ICO 101: Utility Tokens vs. Security Tokens*, <https://strategiccoin.com/ico-101-utility-tokens-vs-security-tokens/>: “If a crypto token derives its value from an external, tradable asset, it is classified as a security token and becomes subject to federal securities regulations. Failure to abide by these regulations could result in costly penalties and could threaten to derail a project. However, if a startup meets all its regulatory obligations, the security token classification creates the potential for a wide variety of applications, the most promising of which is the ability to issue tokens that represent shares of company stock”.

¹⁸³ See Dell’Erba, *supra* note 3.

¹⁸⁴ SEC, *Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO* (July 25, 2017), <http://www.sec.gov/litigation/investreport/34-81207.pdf>.

¹⁸⁵ Section 2(a)(1) of the Securities Act of 1933 contains a list of typical financial instruments qualified as “securities” (“note, stock, treasury stock, security future, bond, [...], transferable share, investment contract”) and provides a circular definition of “security” as “any interest or instrument commonly known as a “security”. See Dell’Erba, *supra* note 9.

¹⁸⁶ *Id.*

Act of 1933 contains “a laundry list of examples,”¹⁸⁷ encompassing typical financial instruments qualified as “security” (“*note, stock, treasury stock, security future, bond . . . transferable share, investment contract*”) and provides a circular definition of “security”¹⁸⁸ as “*any interest or instrument commonly known as a ‘security.’*”¹⁸⁹

¹⁸⁷ See James D. Cox, Robert W. Hillman, Donald C. Langevoort, *Securities Regulation, Cases and Materials*, Eight Edition, 2017

¹⁸⁸ See Giovanni Patti, *Prodotti finanziari e contratti con i consumatori. Una recente pronuncia della Corte di giustizia a confronto con la securities law Americana*, GIUR. COMM. 5, 1015 (2011). The author emphasizes the presence of the “*definiendum*” within the “*definiens*”.

¹⁸⁹ Section 2(a)(1) of the *Securities Act of 1933* (15 U.S.C. 77B(a)(1)) defines “*securities*” in these terms: «*The term “security” means any note, stock, treasury stock, security future, bond, debenture, evidence of indebtedness, certificate of interest or participation in any profit-sharing agreement, collateral-trust certificate, preorganization certificate or subscription, transferable share, investment contract, voting-trust certificate, certificate of deposit for a security, fractional undivided interest in oil, gas, or other mineral rights, any put, call, straddle, option, or privilege on any security, certificate of deposit, or group or index of securities (including any interest therein or based on the value thereof), or any put, call, straddle, option, or privilege entered into on a national securities exchange relating to foreign currency, or, in general, any interest or instrument commonly known as a “security”, or any certificate of interest or participation in, temporary or interim certificate for, receipt for, guarantee of, or warrant or right to subscribe to or purchase, any of the foregoing*». In addition, a further definition of “security” is provided by the *Sec. 3(a)(10) del Securities Exchange Act of 1934*, (15 U.S.C. 78C(a)(10)). The Supreme Court has often considered the two definition identical: See *Marine Bank v. Weaver*, 455 U.S. 551 (1982), 556 n.3; *International Brotherhood of Teamsters v. Daniel*, 439 U.S. 551 (1979), 556 n. 7; *United Housing Foundation, Inc. v. Forman*, 421 U.S. 837 (1975), 847 n.12; *Tcherepnin v. Knight*, 389 U.S. 332 (1967), 335-336, 342. The Uniform Securities Act (2004), sec. 102(28), provides an identical definition of “security” as the one provided by the *Securities Acts*. American regulators opted for a definition of “security” «*in sufficiently broad and general terms so as to include within that definition the many types of instruments that in our commercial world fall within the ordinary concept of a security*», H. R. Rep. No. 85, 73d Cong., 1st Sess. 11 (1933). The Supreme Court emphasized the approach of the Congress in adopting a broad definition of “security”: “In defining the scope of the market that it wished to regulate, Congress painted with a broad brush...[and] enacted a definition of “security” sufficiently broad to encompass virtually any instrument that might be sold as investment in painted with a broad brush in defining the scope of the market that it wished to regulate. *Howey*, 328 U.S. at 299. According to the interpretation of the Supreme Court, this definition “embodies a flexible rather than a static principle, one that is capable of adaptation to meet the countless and variable schemes devised by those who *Seek* the use of the money of others on the promise of profits”. *Howey*, 328 at 299. “Congress therefore did not attempt precisely to cabin the scope of the Securities Acts. Rather, it enacted a definition of ‘security’ sufficiently broad to encompass virtually any instrument that might be sold as an investment.” *Reves v. Ernst & Young*, 494 U.S. 56, 61 (1990). See Miriam R. Albert, *The Howey Test Turns 64: Are The Courts Grading This Test On A Curve?*, 2 Wm. & Mary Bus. L. Rev. 1 2011. See also James D. Cox, Robert W. Hillman, Donald C. Langevoort, *Securities Regulation, Cases and Materials*, Eight Edition, 2017. On the need to combine flexibility and clarity with regard to the definition of “security”, See Giuliano Castellano,

To clarify the definition of “security,” the Supreme Court intervened by explicitly providing the definition of “investment contract,” one of the financial instruments listed as a security pursuant to § 2(a)(1) of the Securities Act of 1933: “*an investment contract for purposes of the Securities Act means a contract, transaction or scheme whereby a person invests his money in a common enterprise and is led to expect profits solely from the efforts of the promoter or a third party . . .*”¹⁹⁰ In addition, the Supreme Court clarified that the notions of “investment contract” and “any interest or instrument commonly known as a ‘security’” were equivalent, making the definition of “investment contract” the general definition of “security.”¹⁹¹

The SEC qualified the ICO tokens as securities after assessing the constitutive elements of the investment contract, applying the so-called “Howey” test in order to ascertain the existence of the four main components characterizing a security as established in American case law: the “*investment of money*,” “*common enterprise*,” “*expectation of profits to come solely from the efforts of the promoter or a third party*”.¹⁹² The Howey test is a useful tool due to its characteristic of incorporating “a flexible rather than a static principle, one that is capable of adaptation to meet the countless and variable schemes devised by those who seek the use of the money of others on the promise of profits.”¹⁹³

In the context of stablecoins, the different stabilizing mechanisms with different types of collateral are unlikely to lead to different classifications of stablecoins as “securities.” After a careful analysis, stablecoins backed with fiat currencies or commodities and stablecoins backed with cryptocurrencies may both qualify as securities. In the case of an off-chain stablecoin, there may be two different situations: if stablecoin is collateralized with fiat currency, this fiat currency is generally held by a custodian, a bank or a trust company’s escrow account, with the value deriving from that asset; if a stablecoin is collateralized by gold or any commodity used as collateral, such

Towards a General Framework for a Common Definition of “Securities”: Financial Markets Regulation in Multilingual Contexts, 17 Unif. L. Rev. (2012), at 457.

¹⁹⁰ *SEC v. W. J. Howey Co.*, 328 U.S. 293 (1946), 298-299.

¹⁹¹ In *United Housing Foundation v. Forman*, the Supreme Court stated that «*We perceive no distinction, for present purposes, between an “investment contract” and an “instrument commonly known as a ‘security’”*» (*United Housing Foundation, Inc. v. Forman*, (nt. 25), 852), consistently with the case *SEC v. C.M. Joiner Leasing Corporation* 320 U.S. 344 (1943), 351, where the Supreme Court provided a more general definition of “security” (“many documents in which there is common trading for speculation or investment”).

¹⁹² Scholars tend to separate the “expectation of profits” from the “efforts of the promoter or a third party”. See Loss Seligman, *Securities Regulation* (New York), II, 1998 (updated with the 2003 supplement). See also Ronald J. Coffey, *The Economic Realities of a “Security”: Is There a More Meaningful Formula?*, 18 W. RES. L. REV. 367 (1966-1967).

¹⁹³ *SEC v. W. J. Howey Co.*, 299.

commodity stored in a vault will determine the value of the coins.¹⁹⁴ Therefore it is likely that in both scenarios stablecoins' may be deemed securities, due to their similarities with "security tokens". A similar conclusion may be reached for stablecoins backed by cryptoassets: they are similar to off-chain stablecoins and derive their value from other assets. Algorithmic stablecoins rely on a mechanism with features that explicitly evoke terms and concepts characteristic of a "security": the issuance of shares and bonds coupled with the expectations that they generate in their shareholders and bondholders.¹⁹⁵

Another possible way stablecoins might trigger securities laws and the definition of "security" is the one of "demand notes". Demand notes are two-party loans with no fixed term or repayment schedule¹⁹⁶, with the debtor in the position to repay the creditor upon request. Demand notes are securities within the meaning of section 3(a)(10) of the Exchange Act.¹⁹⁷ An analysis focusing on the way stablecoins are redeemed may trigger stablecoins' qualification as "security". In most of the cases, stablecoin purchasers deposit fiat currency with a stablecoin issuer, who provides an equivalent amount of the stablecoin. When they want to liquidate their position, stablecoin holders send the stablecoin back to the issuer, who provides an equivalent amount of fiat currency.¹⁹⁸

In the near future, the regulation of cryptocurrencies and digital tokens could drastically change, in particular if the bipartisan initiative promoted by Congressmen Warren Davidson and Darren Soto, the Token Taxonomy Act, is passed. The Token Taxonomy Act aims at excluding token digital tokens from the definition of "security" and exempts "transactions involving the development, offer, or sale of a digital unit" under specific conditions from the Securities Act.¹⁹⁹ In this way, the Token Taxonomy Act implements the view that digital tokens represent an alternative asset class and provides a definition of "digital token" based on four main elements. This could affect the definition of both "traditional" cryptocurrencies and stablecoins under existing securities laws.

¹⁹⁴ Merav Ozair, *Stablecoins, Are They Coins or Security Tokens?*, CRYPTOBLOCKCON (Oct. 17, 2018), https://www.cryptoblockcon.com/stablecoins-are-they-coins-or-security-tokens/#_edn8.

¹⁹⁵ *Id.*

¹⁹⁶ See Investopedia, Demand Note, <https://www.investopedia.com/terms/d/demandnote.asp>.

¹⁹⁷ See *Reves v. Ernst & Young*, 110 S. Ct. at 948.

¹⁹⁸ Jake Chervinsky and Benjamin Sauter, *Will Fiat-Backed Stablecoins Pass Legal Muster With the SEC and CFTC?*, CoinDesk (Mar. 2, 2019), <https://www.coindesk.com/will-fiat-backed-stablecoins-pass-legal-muster-with-the-sec-and-cftc>

¹⁹⁹ *Id.*

Another extremely relevant set of laws to be taken into account when referring to stablecoins is the one of Commodities Exchange Act (CEA) and the role that the U.S. Commodity Futures Trading Commission can play in the context of stablecoins. Stablecoins may trigger two different characterization, as “commodity” or “swaps”. Similar to the definition of “security,” the definition of “commodity” is very broad, encompassing a wide range of products, i.e., physical commodities, such as an agricultural products or natural resources, as well currencies or interest rates. Further, the definition of “commodity” encompasses “all services, rights, and interests . . . in which contracts for future delivery are presently or in the future dealt in.”²⁰⁰ Since 2014, former CFTC Chairman Timothy Massad considered that the agency could have jurisdiction over Bitcoin and more generally over virtual currencies, depending “on the facts and circumstances pertaining to any particular activity in question,” and stated that derivative contracts based on a virtual currency represented “one area within our responsibility.”²⁰¹ *Coinflip*²⁰² introduced a new era of “Bitcoin” as a commodity, with the CFTC order stating that the CEA covers “all services, rights, and interests in which contracts for future delivery are presently or in the future dealt in,” and further stated that the definition of “‘commodity’ is broad . . . Bitcoin and other virtual currencies are encompassed in the definition and properly defined as commodities.”²⁰³ The CFTC charged Coinflip with

²⁰⁰ See Commodities Exchange Act, § 1a(9). “The term “commodity” means wheat, cotton, rice, corn, oats, barley, rye, flaxseed, grain sorghums, mill feeds, butter, eggs, *Solanum tuberosum* (Irish potatoes), wool, wool tops, fats and oils (including lard, tallow, cottonseed oil, peanut oil, soybean oil, and all other fats and oils), cottonseed meal, cottonseed, peanuts, soybeans, soybean meal, livestock, livestock products, and frozen concentrated orange juice, and all other goods and articles, except onions (as provided by [section 13–1 of this title](#)) and motion picture box office receipts (or any index, measure, value, or data related to such receipts), and all services, rights, and interests (except motion picture box office receipts, or any index, measure, value or data related to such receipts) in which contracts for future delivery are presently or in the future dealt in”.

²⁰¹ CFTC, *Testimony of Chairman Timothy Massad before the U.S. Senate Committee on Agriculture, Nutrition & Forestry* (Dec. 10, 2014), <https://www.cftc.gov/PressRoom/SpeechesTestimony/opamassad-6>.

²⁰² CFTC, *In the Matter of Coinflip, Inc., d/b/a Derivabit, and Francisco Riordan* (Sept. 17, 2015), <https://www.cftc.gov/sites/default/files/idc/groups/public/@lrenforcementactions/documents/legalpleading/enfcoinfliporder09172015.pdf>.

²⁰³ *Id.*

the violation of Sections 4c(b)²⁰⁴ and 5h(a)(1)²⁰⁵ of the CEA by “conducting activity related to commodity options contrary to Commission Regulations and by operating a facility for the trading or processing of swaps without being registered as a swap execution facility or designated contract market.”²⁰⁶ Specifically, Coinflip “operated an online facility named Derivabit, offering to connect buyers and sellers of Bitcoin option contracts.”²⁰⁷

A second possibility is that stablecoins could characterize as “swaps” under the CEA, defining swaps as “option of any kind that is for the purchase or sale, or based on the value, of 1 or more interest or other rates, currencies, commodities, or other financial or economic interests or property of any kind”.²⁰⁸ In this second scenario, the CFTC might opt for characterizing stablecoins as “options for the purchase of, or based on the value of, fiat currencies”.²⁰⁹

In the context of stablecoins and their implementation on a large scale, there is no doubt that the CFTC and the interpretation of the CEA will play a crucial role. CFTC’s and commodities laws’ role and contribution in the context of stablecoins may be even more relevant than the one of the SEC, and it may as important as the one that the SEC and securities laws played in the context of ICOs. An example comes from Facebook’s recent initiative to create GlobalCoin, a global payment network potentially based on stablecoins²¹⁰, and the “very early stage conversations” involving the CFTC²¹¹ to consider the regulatory implications of this initiative.

2. Europe

In Europe, similar considerations on securities and commodities laws may lead to analogous conclusions for stablecoins.

At the end of 2017, the European Securities and Markets Authority (ESMA) issued a statement²¹² warning firms involved in ICOs of the need

²⁰⁴ Section 4c(b) of CEA makes it unlawful for any person to “offer to enter into, enter into or confirm the execution of, any transaction involving any commodity ... which is of the character of, or is commonly known to the trade as, an ‘option’ ... , ‘bid’, ‘offer’, ‘put’, [or] ‘call’ ... contrary to any rule, regulation, or order of the Commission prohibiting any such transaction”

²⁰⁵ Section 5h(a)(1) of the Act forbids any person from operating “a facility for the trading or processing of swaps unless the facility is registered as a swap execution facility or as a designated contract market”

²⁰⁶ CFTC, *supra* note 116, at 2.

²⁰⁷ *Id.*

²⁰⁸ Commodity Exchange Act Section 1(a)(47)(A)

²⁰⁹ Chervinsky & Sauter, *supra* note 198.

²¹⁰ See Noonan & Murphy, *supra* note 131.

²¹² ESMA, *ESMA alerts firms involved in Initial Coin Offerings (ICOs) to the need to meet relevant regulatory requirements* (Nov. 13, 2017),

to meet relevant regulatory requirements, mentioning in particular the Prospectus Directive, the Markets in Financial Instruments Directive (MiFid), the Alternative Investment Fund Manager Directive (AIFMD) and the Fourth Anti-Money Laundering Directive. Leaving aside the other regulatory texts, it is useful to refer to the Prospectus Directive and Mifid, which take into account two general concepts: “transferable security” and “financial instrument”. Directive 2004/39 (Mifid Directive)²¹³ provides both the definitions of “transferable security”²¹⁴ and “financial instrument.” In addition, the Mifid directive provides the definition of financial instrument, which encompasses, inter alia, transferable securities, as well as derivative contracts.²¹⁵

A further notion to be taken into account under European law is the one of “financial product.” European law does not explicitly define

https://www.esma.europa.eu/sites/default/files/library/esma50-157-828_ico_statement_firms.pdf

²¹³ Directive 2004/39/EC Of The European Parliament And Of The Council Of 21 April 2004 On Markets In Financial Instruments.

²¹⁴ A transferable security is defined as any class of security “negotiable on the capital market, with the exception of instruments of payment, such as: (a) shares in companies and other securities equivalent to shares in companies, partnerships or other entities, and depositary receipts in respect of shares; (b) bonds or other forms of securitised debt, including depositary receipts in respect of such securities; (c) any other securities giving the right to acquire or sell any such transferable securities or giving rise to a cash settlement determined by reference to transferable securities, currencies, interest rates or yields, commodities or other indices or measures”. Mifid Directive Art. 4 (1)(18)

²¹⁵ Mifid Directive, Annex I, Section C. The notion of financial instrument encompasses: (1) Transferable securities; (2) Money-market instruments; (3) Units in collective investment undertakings; (4) Options, futures, swaps, forward rate agreements and any other derivative contracts relating to securities, currencies, interest rates or yields, or other derivatives instruments, financial indices or financial measures which may be settled physically or in cash; (5) Options, futures, swaps, forward rate agreements and any other derivative contracts relating to commodities that must be settled in cash or may be settled in cash at the option of one of the parties (otherwise than by reason of a default or other termination event); (6) Options, futures, swaps, and any other derivative contract relating to commodities that can be physically settled provided that they are traded on a regulated market and/or an MTF; (7) Options, futures, swaps, forwards and any other derivative contracts relating to commodities, that can be physically settled not otherwise mentioned in C.6 and not being for commercial purposes, which have the characteristics of other derivative financial instruments, having regard to whether, inter alia, they are cleared and settled through recognised clearing houses or are subject to regular margin calls; (8) Derivative instruments for the transfer of credit risk; (9) Financial contracts for differences. (10) Options, futures, swaps, forward rate agreements and any other derivative contracts relating to climatic variables, freight rates, emission allowances or inflation rates or other official economic statistics that must be settled in cash or may be settled in cash at the option of one of the parties (otherwise than by reason of a default or other termination event), as well as any other derivative contracts relating to assets, rights, obligations, indices and measures not otherwise mentioned in this Section, which have the characteristics of other derivative financial instruments, having regard to whether, inter alia, they are traded on a regulated market or an MTF, are cleared and settled through recognised clearing houses or are subject to regular margin calls.

such a notion. However, Directive 2005/29 (Unfair Commercial Practices Directive)²¹⁶ refers to financial products at Recital 10, which clarifies the scope of the directive.²¹⁷ Furthermore, the directive provides a broad definition for “product,” without explicitly referring to financial products, while at the same time not excluding them: “‘product’ means any goods or service including immovable property, rights and obligations. . . .”²¹⁹ At the European level, the notion of “financial product” is broader than the one of “financial instrument,” since the category of financial instruments refers only to typical instruments (mainly shares and debt instruments) with the further characteristic to be negotiable (on a regulated market).²²⁰ This would mean that tokens could, in principle, be qualified as financial products under the European Law, with the consequence of the applicability of the consumer protection regulation for those who purchase tokens.

Although the purpose of providing a notion of “transferable security” and “financial instrument” was clearly inspired by the need to increase harmonization among the European Member States’ securities laws, the two notions have been transposed in the different European countries in different ways.²²¹ This would require a further case-by-case analysis in order to ascertain the potential qualification of ICO tokens and stablecoins as a security or a financial instrument and their treatment in each specific jurisdiction. In addition, apart from any consideration connected to the transposition of the notions of “transferable security” or “financial instrument,” Member States may provide further specific categories of law triggering specific obligations under each legal system.

In relation to the notion of a “financial instrument,” the list contained in Annex C of MiFid Directive refers to commodities, which would allow one to refer to the rules governing commodities. The MiFid Organisational Regulation defines a “commodity” as “any goods of a fungible nature that are capable of being delivered, including metals and

²¹⁶ Directive 2005/29/EC Of The European Parliament And Of The Council of 11 May 2005 concerning unfair business-to-consumer commercial practices in the internal market and amending Council Directive 84/450/EEC, Directives 97/7/EC, 98/27/EC and 2002/65/EC of the European Parliament and of the Council and Regulation (EC) No 2006/2004 of the European Parliament and of the Council

²¹⁷ *Id.*, Recital 10: “This Directive accordingly applies only in so far as there are no specific Community law provisions regulating specific aspects of unfair commercial practices, such as information requirements and rules on the way the information is presented to the consumer. It provides protection for consumers where there is no specific sectoral legislation at Community level and prohibits traders from creating a false impression of the nature of products. This is particularly important for complex products with high levels of risk to consumers, such as certain financial services products. This Directive consequently complements the Community acquis, which is applicable to commercial practices harming consumers' economic interests.”

²¹⁹ *Id.*, art. 2, let. (c).

²²⁰ See Patti, *supra* note 165.

²²¹ See Castellano, *supra* note 166.

their ores and alloys, agricultural products, and energy such as electricity.”²²² Tokens may fall within this definition, but they would not fall within the regulation if they are not derivatives. Therefore, if a token is offered via an ICO, this may not impact its classification as a commodity and vice versa.²²³

To the extent that an issuer takes the view that a token is a commodity, which by the regulatory definition in the EU MiFID Organisational Regulation would require the tokens to be goods of a fungible nature that are capable of being delivered, including metals and their ores and alloys, agricultural products and energy such as electricity, these would be outside the realm of regulation to the extent they are not derivatives. As above, the fact that a token is capable of being offered via an ICO has no bearing on its classification as a commodity and vice versa.

This regulatory scenario may be subject to significant changes, generally impacting cryptocurrencies—and specifically stablecoins. The European Parliament is working on an ad hoc regulation, aimed at providing new rules for ICOs in the context of crowdfunding. The draft of the regulation states that it is an opportunity for ICOs to “take a much-needed step towards imposing standards and protections in place for what is an excellent funding stream for tech start-ups”.²²⁴ The Draft Regulation contains one of the first formal definitions of ICOs elaborated by regulators: “‘Initial Coin Offering or ICO’ means raising funds from the public in a dematerialised way using coins or tokens that are put for sale for a limited time by a business or an individual in exchange for fiat or virtual currencies.”²²⁵ Furthermore, the Draft Regulation opens the possibility that crowdfunding service providers may be “permitted to raise capital through their platforms using certain cryptocurrencies” if they comply with specific additional requirements provided by the regulation.²²⁶ The Draft Regulation provides exemptions for private placements, ICOs raising in excess of €8,000,000 or ICOs that do not use a counterparty do not fall within the scope of those requirements.²²⁷ The intention of the Draft Regulation may be the one to create a standard for

²²² Commission Delegated Regulation (EU) 2017/565 of 25 April 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council as regards organisational requirements and operating conditions for investment firms and defined terms for the purposes of that Directive.

²²³ See Andrew Henderson & James Burnie, *The Financial Technology Law Review* (Jun. 2018), <https://thelawreviews.co.uk/edition/the-financial-technology-law-review-edition-1/1169789/united-kingdom>.

²²⁴ See European Parliament – Committee on Economic and Monetary Affairs, DRAFT REPORT on the proposal for a regulation of the European Parliament and of the Council on European Crowdfunding Service Providers (ECSP) for Business (COM(2018)0113 – C8-0103/2018 – 2018/0048(COD)).

²²⁵ *Id.*, see Article 3- paragraph 1 – point 1b (new).

²²⁶ *Id.*, see Recital 15a

²²⁷ *Id.*, see also Art. 4a.

ICOs, allowing projects to raise funds and conduct business in all the twenty-eight Member States.²²⁸

Furthermore, the European Banking Authority (EBA)²²⁹ and the ESMA²³⁰ called for a common framework for cryptocurrencies. While the ESMA does not mention stablecoins in its document, the EBA includes them under the category of payment/exchange/currency tokens, as distinguished from “investment tokens” and “utility tokens,” after underlying the lack of a common taxonomy in use by international standard-setting bodies.²³¹

D. Consequences of stablecoins for central-bank initiatives: Central bank digital currencies (CBDCs)

In addition to the concerns of securities regulators, cryptocurrencies have caught the attention of central bankers. Private cryptocurrencies circulating in an economy compete with the national central bank’s official currencies, as has happened in the past with other alternative money such as commodities (including gold and silver) and other goods serving as stores of values and media of exchange.²³²

Due to their supposed properties of stability, stablecoins may potentially have a great value as mediums of exchange and further innovate the payment services ecosystem, which traditionally represents “an integral part of central banking.”²³³ Stablecoins’ potential diffusion and adoption would further increase the competition with central banks’ official currencies. The possibility that giants like Facebook (counting on 2 billion of users) and other social media as well as credit institutions such as JP Morgan or other important players may implement a payment system based on stablecoins would be an incredible source of disruption, and its consequences may be profound. These private initiatives certainly lead to an acceleration in the debate on the public side, with governments and central banks more eager to identify potential counter-strategies. This includes the issuance of an official and public²³⁴ “stable” cryptocurrency,

²²⁸ Nikhilesh De, *EU Lawmakers Weigh 'Standard' for ICOs Under Crowdfunding Rules*, COINDESK (Sep 11, 2018), <https://www.coindesk.com/the-european-parliament-wants-to-make-icos-more-accessible/>

²²⁹ EBA, *supra* note 119.

²³⁰ ESMA, *ESMA Advice on Initial Coin Offerings and Crypto-Assets* (Jan. 9, 2018), <https://www.esma.europa.eu/file/49978/download?token=56LqdNMN>.

²³¹ See generally EBA, *supra* note 119.

²³² See generally Max Raskin and David Yermack, *Digital Currencies, Decentralized Ledgers, and the Future of Central Banking* Peter Conti-Brown & Rosa Lastra (eds.), Research Handbook on Central Banking, Edward Elgar Publishing, 2017.

²³³ See BANK FOR INTERNATIONAL SETTLEMENTS [BIS] - COMMITTEE ON PAYMENTS AND MARKET INFRASTRUCTURES MARKETS COMMITTEE, *Central bank digital currencies* (2018), <https://www.bis.org/cpmi/publ/d174.pdf>, at iii.

²³⁴ See Regnard-Weinrabe, Vasu & Al Nakib, *supra* note ... The authors distinguish “private” versus “public” (referring to CBDCs) stablecoins.

fully backed with central bank reserves. The hypothesis of CBDCs as a potential tool for central bankers to pursue their institutional missions started to be discussed in 2014;²³⁵ the concern was that the multiplication of privately issued cryptocurrencies could undermine central banks' leading role and influence in implementing monetary policies and pursuing financial stability. Furthermore, CBDCs could be useful for those banking regulators, such as the European Central Bank (ECB), that otherwise would not be in a position to fully regulate cryptocurrencies, due to a limited mandate and scope of competence and a lack of alternative tools to pursue their goals.²³⁶

CBDCs can potentially serve as alternatives to cryptocurrencies, in particular to stablecoins. "CBDC, not bitcoin," is the new blockchain, it was emphatically stated.²³⁷ Not surprisingly, a long list of governments and central bankers entered into the discussions or started new projects in the field, including the United States, India, Japan, Russia, Switzerland, the Marshall Islands, China, Estonia, Iran and Sweden.²³⁸ Petro, the cryptocurrency backed by Venezuelan oil, launched in 2018, can probably be considered part of this list, as a first attempt to create a fully backed and public cryptocurrency. At the international level, the Bank of International Settlement²³⁹ and the International Monetary Fund published important contributions to the discussion,²⁴⁰ and very recently the Monetary Authority of Singapore (MAS), the Bank of England and the Bank of Canada have considered cross-border interbank payments and settlements, in part based on CBDCs.²⁴¹ The timing of all these initiatives is not accidental; a major crisis affected the capitalization of cryptocurrencies, favoring the growth, both in terms of popularity and value capitalization, for stablecoins.

The term CBDC refers to "a new form of central bank money" that combines "new and already existing forms of central bank money."²⁴²

²³⁵ See JP Koning, *Fedcoins* (Oct. 19, 2014), <http://jpkoning.blogspot.com/2014/10/fedcoin.html>.

²³⁶ See Hossein Nabilou, *Central Bank Digital Currencies: Preliminary Legal Observations*, SSRN (Feb. 6, 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3329993, at 8.

²³⁷ Kevin Rutter, *The Era of Central Bank Digital Currencies Is Within Reach*, COINDESK (Dec. 8, 2018), <https://www.coindesk.com/the-era-of-central-bank-digital-currencies-is-within-reach>.

²³⁸ *Id.*

²³⁹ *Id.*

²⁴⁰ International Monetary Fund (IMF), *Casting Light on Central Bank Digital Currency* (Nov. 12, 2018), <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2018/11/13/Casting-Light-on-Central-Bank-Digital-Currencies-46233>.

²⁴¹ Bank of Canada, Bank of England, Monetary Authority of Singapore, *Cross-border Interbank Payments* (Nov. 2018), <http://www.mas.gov.sg/~media/ProjectUbin/Cross%20Border%20Interbank%20Payments%20and%20Settlements.pdf>.

²⁴² BIS, *supra* note 233, at 3.

CBDC is “a central bank liability, denominated in an existing unit of account, which serves both as a medium of exchange and a store of value,”²⁴³ that could be account-based (implementing payments through the transfer of claims recorded on an account) or token-based (with payments involving the transfer of an object, namely a digital token).²⁴⁴ Notwithstanding the characteristic of being a central bank liability, CBDC differs from other forms of money issued by central banks,²⁴⁵ such as balances in traditional reserve or settlement accounts.²⁴⁶ At the same time, CBDCs would be, in principle, stable and would grant many of the advantages generally associated with cryptocurrencies, opening to designing choices that may have great benefits. The idea of CBDC as a governmental initiative to enter “into the issuance of non-cash money for public usage” is not new, and James Tobin’s deposited currency accounts, defined as a “delegation to the private sector the ‘government’s sovereign right to coin money.’”²⁴⁷ In Tobin’s view, the possibility to have the Federal Reserve in the position to offer deposits directly to the public (deposited currency accounts transferable by wire, check or gyro type payments to other accounts within the system) served as a remedy for the physical defects of central bank money.²⁴⁸

Furthermore, CBDCs would not be the first governmental initiatives aimed at issuing non-cash money; the postal savings banking systems put in place in the nineteenth and the twentieth centuries are an antecedent in this sense.²⁴⁹

²⁴³ *Id.*

²⁴⁴ IMF, *supra* note 13. Token-based and account-based have different characteristics. As the IMF explains, token-based CBDCs “could extend some of the attributes of cash to the digital world. CBDC could provide varying degrees of anonymity and immediate settlement. It could thus curtail the development of private forms of anonymous payment but could increase risks to financial integrity. Design features such as size limits on payments in, and holdings of, CBDC would reduce but not eliminate these concerns”. Account-based CBDCs “could increase risks to financial intermediation. It would raise funding costs for deposit-taking institutions and facilitate bank runs during periods of distress. Again, careful design and accompanying policies should reduce, but not eliminate, these risks”.

²⁴⁵ BIS, *supra* note 233, at 5.

²⁴⁶ IMF, *supra* note 13, at 7.

²⁴⁷ See JP Koning, *Fedcoin: A Central-Bank Issued Cryptocurrency* (Nov. 15, 2016), https://www.r3.com/wp-content/uploads/2018/04/Fedcoin_Central_Bank_R3.pdf. A further example that the author reports is the so-called 1933 Chicago Plan: “The 1933 Chicago Plan, named after a group of University of Chicago economists who wanted to avoid a repeat of the Great Depression, proposed the creation of ‘deposit banks.’ These institutions would be required to keep a 100% reserve of dollars, ensuring that sudden redemption requests by depositors could always be met. As for the traditional practice of matching savers with lenders, the Chicago economists called for the establishment of ‘investment trusts’”.

²⁴⁸ *Id.*

²⁴⁹ *Id.*

From a technical perspective, a central bank would be in the position to create a token-based or an account-based digital currency. The first option would require simply using Ethereum's ERC-20 or ERC-223 token standards for implementing a smart contract²⁵⁰ or with so-called colored coins, or alternatively developing a new blockchain, with the opportunity in all cases to issue central bank cryptocurrency on a public blockchain.²⁵¹ By buying and selling any token at par, the central bank would "ensure parity between a crypto fiat unit and central bank reserves," with the valuation strictly correlated to the central bank's credibility.²⁵² The second option, the account-based option, does not deem necessary the creation and reliance on a blockchain infrastructure; central banks could simply allow citizens to open accounts with them for the purpose of making their payments with central bank electronic money instead of recurring to commercial bank deposits.²⁵³ A major benefit with this choice would be the satisfaction of the population's need for virtual currency while eliminating counterparty risk.²⁵⁴

Different policy reasons support a central bank's decision to issue CBDCs. There may be benefits related to financial inclusion; in a context where cash may disappear, digital currencies may be the only viable option to connect business and people located in remote and marginalized regions where banks have no interest to be present.²⁵⁵ In addition, CBDCs may increase the efficiency of the currency function as well as the efficiency and safety of retail and large-value payment systems.²⁵⁶ Furthermore, in an economic context where payment innovations including privately issued e-money and digital currency have proliferated, central banks may have an interest in disposing of an instrument with the

²⁵⁰ For a comparison of the two standards, see Leonid Beder, *The New ERC223 Token Standard*, MEDIUM (Dec. 5, 2017), <https://medium.com/kinblog/the-new-erc223-token-standard-8dddbf1a5909>. A technical protocol describing such standards can be found at https://theethereum.wiki/w/index.php/ERC20_Token_Standard.

²⁵¹ Berentsen and Schar, *supra* note 35. Regarding "colored coins", the authors explain that: "one could attach additional value components to fractions of existing cryptoassets, such as Bitcoin. The additional value—in this case, fiat currency—would then be part of a specific fraction of a Bitcoin (or more precisely an unspent transaction output) and could be represented and traded on the Bitcoin blockchain. This is usually referred to as "colored coins."

²⁵² *Id.*

²⁵³ *Id.*

²⁵⁴ *Id.*

²⁵⁵ See Christine Lagarde, *Winds of Change: The Case for New Digital Currency* (Nov. 14, 2018), <https://www.imf.org/en/News/Articles/2018/11/13/sp111418-winds-of-change-the-case-for-new-digital-currency>.

²⁵⁶ See Ben Siu Cheong Fung and Hanna Halaburda, *Central Bank Digital Currencies: A Framework for Assessing Why and How* (Nov. 28, 2016), <https://ssrn.com/abstract=2994052>.

characteristics of CBDCs that may be helpful to pursue its traditional institutional goals in monetary policy and financial stability.²⁵⁷

Traditional reserves are available exclusively to institutional operators, generally banks holding accounts at the central bank serving to settle wholesale interbank payments only.²⁵⁸ CBDCs would target retail payments, with the consequence of being widely available, although in a form different from the physical one of cash.²⁵⁹ Similar to cryptocurrencies, CBDCs would be available twenty-four hours a day, while traditional cash is limited to central bank operating hours.²⁶⁰ By being widely available, it could be easily used by a country's residents, as well as foreign individuals and organizations situated abroad, for person-to-person, person-to-business and business-to-business transactions of any amount.²⁶¹ Therefore, CBDCs have a great potential for disintermediating the existing system, which is based on commercial banks acting as intermediaries. This would depend on the design options, since a CBDC could be transferred either on a peer-to-peer basis or through a designated intermediary, such as a central bank, a commercial bank or even a third-party agent.²⁶² Furthermore, token-based CBDCs have the potential to be fully anonymous vis-à-vis central bankers,²⁶³ even more than existing cryptocurrencies which are not anonymous due to the necessary intermediation of individuals and organizations that leave a digital footprint by using cryptowallets.²⁶⁴ The degree of anonymity vis-à-vis the central bank can be established, taking into account risks related to illegal activities and privacy.²⁶⁵ Similar to other digital central bank liabilities, CBDCs may also pay positive and negative interests, and this is relevant for them to serve as a store of value.²⁶⁶

According to Nouriel Roubini, who is traditionally against blockchain and cryptocurrencies, CBDCs have the potential to displace cryptocurrencies for many of these reasons.²⁶⁷ Cryptocurrencies, and stablecoins more recently, have been viewed as disruptors potentially capable of disintermediating any kind of centralized authority, including

²⁵⁷ *Id.*

²⁵⁸ IMF, *supra* note 13, at 7.

²⁵⁹ BIS, *supra* note 233, at 7.

²⁶⁰ IMF, *supra* note 13, at 7.

²⁶¹ *Id.*

²⁶² BIS, *supra* note 233, at 6.

²⁶³ *Id.*

²⁶⁴ Nouriel Roubini, *Why Central Bank Digital Currencies Will Destroy Cryptocurrencies*, PROJECT SYNDICATE (Nov. 18, 2018), <https://www.project-syndicate.org/commentary/central-banks-take-over-digital-payments-no-cryptocurrencies-by-nouriel-roubini-2018-11>.

²⁶⁵ IMF, *supra* note 13. See also, BIS, *supra* note 233.

²⁶⁶ Roubini, *supra* note 264.

²⁶⁷ Roubini, *supra* note 264.

central banks.²⁶⁸ However, the significant efforts that may be implemented to absorb these innovations²⁶⁹ may lead to other scenarios, including a non-disruption of central banks by cryptocurrencies, namely by stablecoins. This would not be unexpected, especially taking into account an antecedent like fintech; the multiplication of fintech innovations was supposed to disrupt many established financial institutions operating in banking and finance. In that case, the significant efforts put in place led to internalizing such innovations with changes in the business model and services offered that reflect the changed conditions. Venture capitalists are another great example of institutions capable of internalizing new technologies in their business model: many commentators predicted that ICOs would disrupt venture capitalists due to the significant advantages they present for entrepreneurs,²⁷⁰ but they maintained a key role in the transition toward a new era of financial economy. In a similar way, CBDCs may be a tool that central banks and governments could use to prevent their disruption and to continue to play a central role even in the new paradigm of digital economy, where the rate at which the tokenization of real assets is expected to grow exponentially.

Indeed, the role that CBDCs would have in the economy would not significantly differ from the one for which cryptocurrencies were created, and their improved model, i.e. stablecoins, was proposed. CBDCs and stablecoins share some similarities, and therefore a co-existence between cryptocurrencies, in particular stablecoins, and CBDCs is unlikely to occur. A CBDC would serve the purpose to bridge the existing gap, separating the real and the digital economies, and the fiat and the digital currency²⁷¹, and this is the main purpose that a stablecoin would serve in the mind of their creators.

Assuming that stablecoins and CBDCs have the same function in the digital economy and that they co-exist, why should a hypothetical economic actor opt for stablecoins instead of CBDCs? A stablecoin's private issuer would have to compete with a central banker in terms of credibility, auditing, reserves and so on—there may not be sufficient reasons for preferring a stablecoin in lieu of a CBDC.

²⁶⁸ BIS, *supra* note 233.

²⁶⁹ Rainer Michael Preiss, *National Government Digital Currencies Versus Globally Distributed Cryptocurrencies: in Depth*, COINDESK (May 21, 2018), <https://cointelegraph.com/news/national-government-digital-currencies-versus-globally-distributed-cryptocurrencies-in-depth>.

²⁷⁰ See Laura Shin, *This VC Is Sure Venture Capital Is About To Be Disrupted*, FORTUNE (Apr. 18, 2017), <https://www.forbes.com/sites/laurashin/2017/04/18/this-vc-is-sure-venture-capital-is-about-to-bedisrupted/#70739cc9324e>.

²⁷¹ Connie Wang, *A Central Bank Digital Currency Is Created Primarily for Replacing Existing Stablecoins, Says Expert*, 8BTC (Jun. 14, 2018), <https://news.8btc.com/a-central-bank-digital-currency-is-created-primarily-for-replacing-existing-stablecoins-says-expert>.

Furthermore, it is interesting to note that CBDCs have the potential to be truly “universal” by adopting the terminology of the Bank of Canada, the Bank of England and the Monetary Authority of Singapore. Indeed the document refers to a “universal Wholesale CBDC . . . backed by a basket of currencies issues by the participating central banks.”²⁷³ This universality would be a further reason to believe that CBDC would be capable of disrupting the disruptors, i.e. privately issued cryptocurrencies.

However, some critics have emerged for CBDCs executed on the blockchain, mostly due to the properties of blockchain. Although central bank money in electronic form may have significant advantages, a reputed central bank should not have any incentive in issuing a cryptocurrency, due to the high reputational risks mostly related to the anonymity mechanisms underlying the cryptocurrency (it would be embarrassing for a central bank that a drug cartel would use its cryptocurrency for illegal purposes). At the same time, issuing a cryptocurrency would generate a disincentive for commercial banks to implement “know your customer” and “anti-money laundering” regulations in a situation where the central bank would not de facto implement them. There are also major concerns related to emerging unpredictable operational risks, due to the relative novelty of the blockchain technology.²⁷⁴ Furthermore, critics argue that the demand for anonymous payments could be satisfied by the private sector with cryptocurrencies, which would be a protection for citizens from bad governments, with the need of a transparent payment system serving as a protection from governments from bad citizens.²⁷⁵ In a system where different forms of money have always coexisted, a hybrid solution would continue to serve different purposes. IMF Chairman Christine Lagarde expressed her concern about the risk that excessively popular cryptocurrencies would stifle innovation and advocated for a hybrid solution where private and public initiatives can effectively cooperate:

What if, instead, central banks entered a partnership with the private sector—banks and other financial institutions—and said: you interface with the customer, you store their wealth, you offer interest, advice, loans. But when it comes time to transact, we take over. This partnership could take various forms. Banks and other financial firms, including startups, could manage the digital currency. Much like banks which currently distribute cash. Or, individuals could hold regular deposits with financial firms, but transactions would ultimately get settled in digital currency between firms. Similar to what

²⁷³ Bank of Canada, Bank of England, Monetary Authority of Singapore, *supra* note 241.

²⁷⁴ Berentsen and Schar, *supra* note 35.

²⁷⁵ *Id.*

happens today, but in a split second. All nearly for free.
And anytime.²⁷⁶

IV. CONCLUSION

Stablecoins emerged as a new tool in digital economy, and part of a broad transformation starting in the securities context with ICOs, and involving the payment system, central banking activities and monetary policy issues.

With the increasing tokenization of real assets, it will be crucial to bridge the gap between the real world and the digitized world, as well as between cryptocurrencies and fiat currency. To do this, a stable cryptocurrency may be important, as stability is necessary for blockchain to function and grow as an infrastructure, and for cryptocurrencies to fully implement the three features generally associated with traditional currency, i.e. being a store of value as well as a medium of exchange and a unit of account.

However, past stablecoins have failed or were traded for less than \$1, and there is no empirical evidence that they may be sustainable in the long term or that they do not increase volatility by increasing opportunities for speculation.

Furthermore, stablecoins are not a homogeneous category and encompass three main categories: off-chain collateralized stablecoins, which are tied to fiat currency as a form of collateral; on-chain collateralized stablecoins, which are collateralized with a cryptocurrency or a basket of cryptocurrencies; and algorithmic stablecoins, based on a self-sustaining smart-contract framework that manages the supply of stablecoins. All three categories of stablecoins present some problems. Off-chain collateralized stablecoins count on a centralized structure and require an adequate level of auditing to solve the problems of transparency afflicting the vast majority of the existing cryptocurrencies. On-chain collateralized stablecoins still depend heavily on traditional cryptocurrencies; therefore, it is highly uncertain whether this type of collateral, still highly volatile, can for itself solve the problems of volatility. Finally, algorithmic stablecoins implement a seigniorage mechanism, whose outcome is still uncertain, especially because it would require a continuous growth of the network to be sustainable.

In addition to the uncertainties related to the designing options, further sources of uncertainty are the relationship between stablecoins, other cryptocurrencies, and their potential regulatory framework. With regard to the first problem, evidence of the role of Tether in the Bitcoin bubble is a major concern. The unclear relationship between the exchange ownership and Tether ownership raises unresolved conflicts of interests. With regard to the second problem, the regulatory uncertainties

²⁷⁶ See Lagarde, *supra* note 255.

characterizing the wave of cryptocurrencies and ICOs between 2017 and 2018 have not been fully solved. Although in a hypothetical taxonomy stablecoins would fall under the category of payment tokens (therefore not securities), they may still be susceptible to securities and commodities laws in Europe and the United States.

Finally, stablecoins may accelerate a “public decision” by governments and central bankers to design and issue an official CBDC (token based or account-based), whose utility and function is fungible with stablecoins. In this case, different uncertain scenarios may emerge, in particular official CBDCs may disrupt the disruptors (both traditional cryptocurrencies and stablecoins). An alternative scenario would be that a hybrid solution based on the complementarity of private anonymous cryptocurrencies and public digital currencies may be found, as advocated by some academics and the chairman of the IMF, Christine Lagarde.²⁷⁷

²⁷⁷ *Id.*