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Implications Of Crypto Assets On The Macroeconomic Sector

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Abstract: There are numerous untested concerns about cryptocurrencies and the economic consequences of their varied implementations. There is a wide range of viewpoints and estimates for the future, and the economic consequences will differ based on countries, which may give advantages and downsides. Furthermore, there is inadequate data to develop macroeconomic models for crypto assets considering none have been incorporated in monetary finance statistics. In order to predict the macroeconomic implications of various regulation scenarios, a literature analysis was conducted on publications that gave qualitative analysis of how cryptocurrencies might impact particular economies and the international financial system.
The possibility of macroeconomic implications discussed in this study are classified according to the following criteria: financial stability; equity and safety; innovation; and sustainability. Using data from financial institutions, crypto asset service providers, and analytics firms, crypto assets pose a systemic a risk to the financial system's stability but also failed to advance financial inclusion. Concern about crypto assets unilization to facilitate illicit activities remain overblown, but its threat to environmental sustainability is significant, due to the “proof-of-work” mining method and its reliance to fossil fuel. Policymakers should work proactively with business and technology communities to clarify how regulatory models are shaped and to mitigate economic risks as much as feasible.

Keywords: Crypto assets; Macroeconomic; Financial System

INTRODUCTION

The expansion of international trade and capital flows in global financial transactions between economic actors necessitates the development of financial instruments to improve their efficacy in performing financial activities. Aside from US dollars, Euros, and other fiat currencies, cryptocurrencies are becoming growing in popularity. Cryptocurrency is a fairly recent financial instrument, but it has been commonly used by businesses to improve payment efficiency while also making investments (European Systemic Risk Board, 2023). The benefits of cryptocurrencies include instant access to crypto wallets anywhere anywhere and at any time, relatively inexpensive transaction costs, and the elimination of hurdles when transferring monetary resources across national boundaries (Qaroush et al., 2022). The

fundamental technology of cryptocurrencies has proved to be advantageous to those in the public sector and has the potential of improving financial inclusion, but both of these advantages have yet to be realized International Monetary Fund, 2023).

The crypto asset market is becoming increasingly complicated and volatile, attaining a market capitalization of 3 trillion dollars at its highest level in November 2021 before dropping to roughly 1 trillion dollars in June 2023 (Ossinger, 2021). Comparison of volatility between cryptocurrencies and fiat currency depicted in Figure 1.

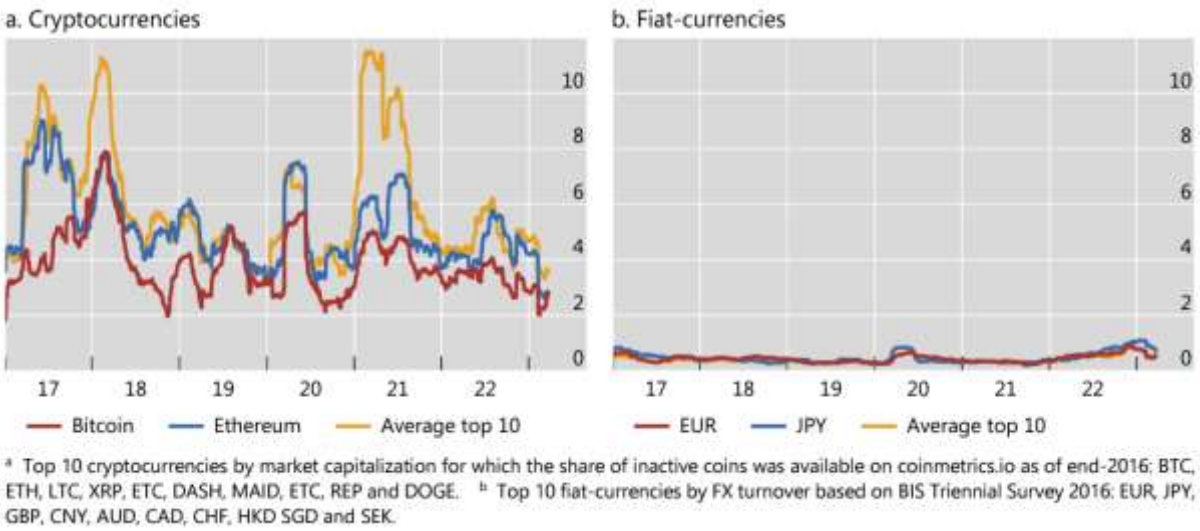

Figure 1. The Exchange Rate Volatility of Cryptocurrencies and Fiat Currencies

The complexity and volatility of these crypto assets stem from the enormous number of unguaranteed assets, such as Bitcoin or Ethereum, towards assets with a value that is fixed to the US dollar, such as stablecoin, but with obscure practices. Furthermore, the infrastructure and environment for trading or exchanging crypto assets (crypto wallet) have evolved to facilitate investing in crypto assets (Makarov & Schoar, 2022). As consequently, cryptocurrency assets pose a significant risk. Moreover, crypto assets are yet to become a substantial component of the global financial system and carry systemic vulnerabilities in certain countries/jurisdictions. Policymakers need to establish comprehensive laws to protect consumers, limit exposures to the established financial sector, and ensure financial resilience and integrity (World Economic Forum, 2022).

This study focuses on the macroeconomic implications of crypto assets, particularly unsecured ones, since they may cause significant potential consequences for macroeconomic stability. The consequences in query comprises the implications of technology and crypto asset design on applicable monetary policy, financial stability, public revenue management, and monetary system stability, providing these conform to current rules and regulations. The objective of this study is to uncover possible benefits and drawbacks of crypto assets while leaving judgment to decision makers. Aside from that, it provides as an example for further discussion on macroeconomic stability policy.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

As of this moment, the existence of crypto assets is not regulated by any formal international legislation (Fajri & Yamin, 2019). This study's definition confines itself to the perspectives of global organizations in charge of overseeing trade and monetary policies.

The term "crypto assets" refers to a wide category that encompasses a variety of formats but has certain fundamental characteristics, such as being a distributed digital asset supplied by individuals that is distributed using distributed ledger technologies (DLT) or similar technologies and is encrypted for security. The definition of crypto assets by several world financial organizations is summarized in Table 1.

Table 1. Definitions of Crypto Assets

Organization	Definition
Bank for International Settlements (2022)	"Private digital assets that depend on cryptography and distributed ledger technologies (DLT) or similar technologies. Digital assets are a digital representation of value, which can be used for payment or investment purposes or to access a good or service".
Organisation for Economic Cooperation and Development (2022)	"Assets that can be held and transferred in a decentralized manner, without the intervention of traditional financial intermediaries, include stablecoins, derivatives issued in the form of crypto assets and certain non-fungible tokens (NFT)".
Financial Action Task Force (2021)	"Virtual assets (crypto assets) refer to any digital representation of value that can be digitally traded, transferred or used for payment. It does not include digital representation of fiat currencies".
International Monetary Fund (2022)	"Digital representations of value that rely on cryptography and decentralized peer-to-peer architecture based on distributed ledger technology (DLT), which enables two parties to directly transact with each other without the need for a trusted intermediary".
European Central Bank (2019)	"A new type of asset recorded in digital form and enabled by the use of cryptography that is not and does not represent a financial claim on, or a liability of, any identifiable entity".
Financial Stability Board (2020)	"A type of private sector digital asset that depends primarily on cryptography and distributed ledger or similar technology".

There are two forms of crypto assets: secured assets and unsecured assets. The value of secured crypto assets can be determined with the collateral assets, whereas unsecured assets are not collateralized or related to any asset (Bolt et al., 2022). Since unsecured assets are not dependent on future profit sharing or coupon payments, their value is more volatile and subject to supply and demand fluctuations. As a result, they lack intrinsic value (Bains et al., 2022). Regulations or policies pertaining to the application of cryptocurrency assets have a short- and long-term impact on the macroeconomic environment. It is well recognized that, to a certain extent of relevance, there is an effect on GDP growth, trade deficits, interest rates, and inflation. This has its foundation on the fact that the financial

sectors both the public and private sectors are interconnected and do not function in an economic isolation (Ješić, 2013).

Due to the unpredictability of crypto assets and their volatile values, which deplete investors' balance sheets, financial stability is vulnerable to disruption (Macdonald & Zhao, 2022). Financial institutions that lend capital to cryptocurrency sellers or accept cryptocurrency as collateral for loans are also directly exposing traditional financial stability to credit or other financial services. Significant adoption of crypto assets might affect bank liquidity since risk exposure is increased by leverage and connections among holders of corresponding assets (Buch, 2023).

The rise in equality and financial inclusion can be attributed to crypto assets utilization. This is made feasible by the fact that DLT, the technology underpinning of crypto assets, can lower transaction costs and prices, particularly for cross-border transactions (Zetzsche et al., 2021). But crypto assets create new opportunities for organized crime, fraud, and corruption, which presents additional challenges for international regulators tasked with implementing laws against money laundering and financial support of terrorism (Collins, 2022; Panda & Jani, 2019). However, empirical data indicates an inadequate correlation between the level of cryptocurrency usage and the Corruption Perception Index (CPI) (Wawrosz & Lánský, 2021).

The adoption of crypto assets in the private sector spurs innovation by disseminating information from the asset development community and enhancing the security of financial transaction technology (Wharton Blockchain and Digital Asset Project, 2021). In the public sector, implementing the technology underlying crypto assets might prove beneficial for developing, operating, or monitoring digital infrastructure for facilitating cross-border payments, hence enhancing transaction efficiency (Adrian et al., 2022).

The impact of cryptocurrency adoption on environmental sustainability differs according to the consensus of the asset's establishments. It is energy costly for assets that using a proof-of-work consensus mechanism, such as Bitcoin. Meanwhile, crypto assets that rely on a consensus proof-of-stake algorithm require less energy and are even more efficient than conventional banking transaction systems since they use pure digital solutions rather than physical payment instruments like cash or electronic cards (Agur et al., 2022; Khazzaka, 2022). These criteria form indicators of macroeconomic outcomes, and described in Table 2.

Table 2. Criteria of Macroeconomic Outcomes

Criteria	Measurements	Indicators
Financial Stability	Monetary Stability	Exchange rate
	Financial System Stability	Liquidity
		Risks
Inclusion and Security	Access to financial systems	Financial inclusion
	Protection from illegal activities	High risk activity level
Innovation	Innovation and efficiency	Impact of innovation
		Benefits of efficiency
		Multiplier effect
Sustainibility	Environmental sustainability	Energy consumption

METHODS

This study applies the literature review method, which provides a comprehensive review of prior research on a certain object in order to provide an overview of what has or has not been revealed about the subject of the study, in addition to get rational thought and new ideas for potential future studies (Denney & Tewksbury, 2013). The author conducts a descriptive examination of information sources before using methods to process and develop the information gathered.

RESULT AND DISCUSSION

BenSaïda (2023) discovered a strong relationship of Bitcoin and the developed G7 exchange rates, as well as the emerging BRICS exchange, particularly during the 2021 and 2022 bitcoin crashes. The association of cryptocurrencies and fiat currencies could signal the end of Bitcoin's market isolation. Dumitrescu et al. (2023) reported a statistically significant correlation between variations in the retail value of Bitcoin and fluctuations in the nominal currencies of nine European non-euro nations. Their findings demonstrated that, under typical market circumstances, a rise in the market value of Bitcoin causes these currencies to appreciate, but that connection reversed during the COVID-19 pandemic. This study mainly implied that fluctuations in the value of Bitcoin might have an impact on how monetary policy is implemented through the exchange rate channel. Safiyanu et al. (2022) found that the volatility in cryptocurrency values has a detrimental impact on the exchange rate. In the long term, if cryptocurrency prices are more volatile it will cause people to be less reluctant to invest. Hence, people tend to switch from cryptocurrency so that the domestic currency will be appreciated. Liquidity effects refer to large-scale conversions into crypto assets and its monetary effects if kept in the domestic financial system. Havidz et al. (2021) showed that Bitcoin price strongly drives liquidity, based on their observation on 18 countries. A high liquidity asset, like Bitcoin in this instance, will draw investors as they can profit more from it, thus increasing money supply. Hacibedel and Perez-Saiz (2023) summarize the main implications related to the incorporation of cryptocurrency as legal tender in El Salvador and Central African Republic. These are: capital flow fluctuations; exchange rate pricing out of line with fundamentals; weakening of anti-money laundering surveillance; spillovers from trade partners; and extreme fluctuations of remittances. Consultative Group of Directors of Financial Stability (2023) stated, altough crypto assets was promoted as alternatives for entering the financial system as well as a replacement for national currencies in countries experiencing severe levels of inflation or fluctuating exchange rates, they rather amplified the financial risks in these countries. Crypto assets will also gain more pressing as they become more broadly used by regular investors and integrated into the established financial system.

Cryptocurrencies may extend financial reach that could advance financial deepening and inclusion. However, Carmona (2022) argued that crypto asset's existing capabilities do not meet the demands of the individuals it promises to support, and it comes with a slew of risks and downsides that negate its benefits. More concerning, connections of crypto assets along with other predatory products have been identified, highlighting the potential for it to aggravate inequality financial services to historically marginalised communities. Fredman and Phillips (2022) pointed that insufficient amount of scientific evidence indicating crypto transactions are cheaper than conventional financial transactions, since crypto assets remain mainly utilized for speculations rather than payments. The fundamental objective of financial inclusion is to enhance low-income individual's overall financial condition rather than pushing them to use their earnings or savings to purchase extremely risky investments. Schulp et al. (2023) revealed that claims about crypto is criminals' preferred tool exaggerate the role of cryptocurrency in funding illegal activity. Citing from 2022 Government

Accountability Office report, while the usage of virtual currencies for drug and human trafficking is growing, they made up only about 5 percent of the global trafficking market and still primarily use cash. Whittaker (2022) explored the financial means used to terrorism activities and found that money service businesses, such as Moneygram or Western Union, are the predominant method of terrorism financing, while only 1% of terrorist actors utilized cryptocurrencies to move money. Thus, widespread exploitation of digital assets such as cryptocurrencies to fund terrorism are almost certainly overblown. Patsakis et al. (2023) show that money laundering activities with cryptocurrencies are amounts to a measly 1.03-2.6% of the global estimated money laundering size, which the UNODC estimates somewhere between $800 billion and $2 trillion. Volume of all illegitimate cryptocurrency transactions from 2017 to 2022 and its trend line is shown in Figure 2.

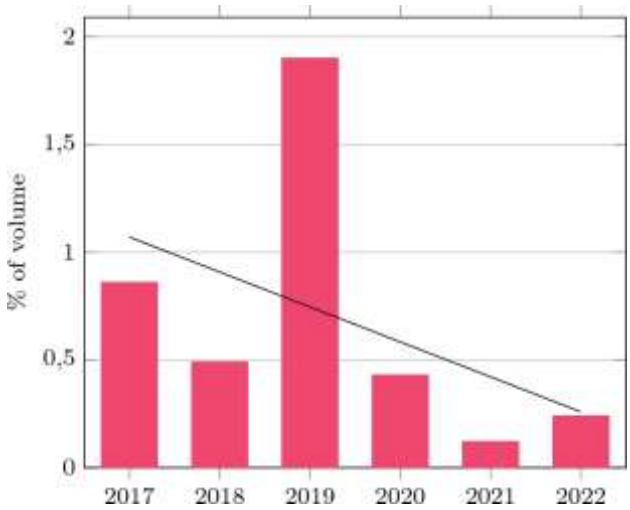

Figure 2. Illicit Share of All Cryptocurrency Transaction Volume, 2017–2022

Crypto technologies often rely on automated processes with decentralized design and constantly evolving and transmuting, which makes governance more difficult. According to Hacibedel and Perez-Saiz (2023), this rapid progression could escalate cyber-attack vulnerabilities, as specialist crypto businesses may have inferior oversight and risk management systems, and also lackluster governance than big and regulated financial intermediaries. There is currently little evidence that cryptoc assets have a significant effect on market efficiency. Altough, its foundation technology, blockchain, has demonstrated its ability to improve data security and minimize potential risks related to conventional financial transactions at the microeconomic level. According to Prados-Castillo et al. (2023), blockchain technology makes it possible to use online payment platforms in business-to-consumer transactions, which directly affects how well tourist-focused services are personalized. Large tourist organizations including airlines, tour operators, and the logistics industry have already begun implementing these services. Du et al. (2023) found that blockchain-related activities improve investment efficiency by preventing overinvestment and reducing underinvestment.

Papp et al. (2023) found that carbon emissions correlate significantly to crypto mining benefits. A $1 rise in Bitcoin price results in $3.11-$6.79 costs to the environment. solely from carbon emissions, surpassing the value added by cryptomining. Chamanara et al. (2023) emphasized the cryptocurrency network's excessive reliance on fossil fuels and natural resource-intensive sources of energy, resulting in significant yet unmonitored and uncontrolled environmental footprints. According to Cambridge Centre for Alternative Finance (2023), the global electricity consumption for cryptomining as of July 2023 is expected to be above 173 TWh. So, if cryptomining were a country, its consumption of

electricity would have placed it 27th in the world, ahead of Pakistan, which has a population of over 230 million people.

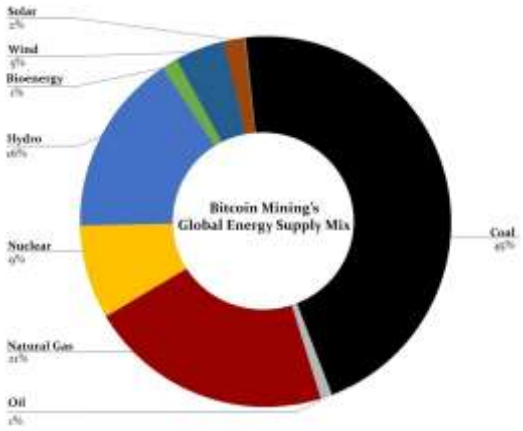

Figure 3. Energy Sources in Supplying Electricity to the Global Bitcoin Mining Network

Figure 4. Electricity Use of Cryptomining Across the World

As stated by Wang et al. (2022), the rising issue of climate change is exacerbated by cryptomining, which significantly depends on fossil fuels as its primary energy source. Since cryptocurrencies are speculative assets, their extensive use of energy may be justified as needless, wasteful, and unsustainable given that they're unable to truly benefit economy or society.

CONCLUSIONS

Crypto assets are not resistant to the impacts posed by macroeconomic shifts, even if their efficacy also depends on by other factors such as technology and market condition. As more institutional investors flock to cryptocurrency, the market's link with macroeconomic indicators might get closer and more correlated with those associated with conventional financial assets. If this occurs, the risk of contagion between conventional and crypto assets may grow, potentially in either direction. With policymakers raising their awareness of cryptocurrency risks, the associations between the rapidly emerging crypto ecosystem, the global economy, and financial markets remain evolving.

Financial integrity depend on data collection and analysis, which remains complicated. Unregulated crypto exchanges' intra-firm and off-chain transactions remain unclear. Using

data from financial institutions, crypto asset service providers, and analytics firms may aid in constructing a picture of ongoing activity. Considering the fewer exposure of banks and other traditional financial institutions to crypto assets, financial stability risks were not deemed to be important at this time. The markets for cryptoassets, however, have the potential to grow to the point where they pose a systemic threat to the stability of the financial system. Concerns about the environmental impact of crypto assets have mostly remained persistent, as expensive "proof of work" mining method are still widely utilized and other less computationally intensive validation methods, such as "proof of stake," are rarely implemented.

Policymakers need to act swiftly towards collecting macroeconomic implications data and start developing regulatory frameworks tailored to crypto assets. To prevent regulatory arbitrage, they need to collaborate with the business and technology communities to gather feedback on the consequences that different regulatory systems will make. It should encourage monetary stability, financial system stability, financial system access, protection against unlawful activity, innovation, and environmental sustainability. The future priorities shall be embracing innovations that blockchain technologies enable through regulations in order to mitigate economic risks to the greatest extent possible..

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