

Comparison Study of the Top 5 Leading Cryptocurrencies based on General Consensus Protocol: Bitcoin, Ethereum, Tether, XRP and Bitcoin Cash

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Abstract: - Bitcoin has had a tremendous impact on the monetary system around the globe today since its launch in 2009 by its founder, Satoshi Nakamoto. Since then, over three thousand cryptocurrencies have risen to compete with traditional fiat currencies. While many experts believe that cryptocurrencies are more comparable to assets like gold, few others believe that cryptocurrencies could replace traditional fiat currencies as a medium of payment, just as Satoshi envisioned when he published the Bitcoin protocol. As such, there exist few papers in the literature discussing the potential for Bitcoin to become a major payment currency. Nevertheless, there is a lack of research in evaluating whether Bitcoin is set to dominate the market as a payment currency, or whether another cryptocurrency would take the lead. In addition, the issue of strict regulation capping the potential of cryptocurrencies has been well-studied in the literature and, hence, this paper tries to evaluate the top five leading cryptocurrencies (based on their market cap value as of July 2020) from a different perspective. Particularly, the evaluation is based on five benchmark evaluation factors: Speed, Activity, Decentralization, Users, and Community. For this preliminary study, we assign all these benchmarks an equal weight. Our conclusion shows that Ethereum could be more suitable as a future payment currency rather than Bitcoin.

Key-Words: - Bitcoin, Ethereum, XRP, Tether, Bitcoin Cash, cryptocurrency, blockchain, transaction per second (TPS)

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1 Introduction

In 2009, the rise of the first cryptocurrency, Bitcoin, which operated at the top of blockchain-decentralized public ledger technology (DLT), marked the beginning of a new monetary era. Unlike the traditional centralised monetary system that is tightly controlled by sovereign central banks, Blockchain's DLT network is a peer-to-peer network that eliminates the third party, banks, from being the median of exchange between the two end parties, leading to eventually ending the domination of the sovereign central banks.

Over the years, cryptocurrencies, led by Bitcoin, gradually got the attention of the public including developers, investors, and authorities. As a novel disruptive monetary system, cryptocurrencies are getting a collective momentum contending fiat currencies, [1]. At the same time, these cryptocurrencies are facing a plethora of challenges preventing them from flourishing to their true

potential as major payment currencies as envisioned by the Bitcoin founder, S. Nakamoto, [2]. Next, we briefly list some of the major challenges that cryptocurrencies are facing, followed by our approach to identify which of the cryptocurrencies is set to be the payment currency of the future.

1.1 Technical Challenges

The modern payment system went through multiple generations to become reliable, secure, and fast. On the other hand, cryptocurrencies are still in their infancy. Among the main milestones in the cryptocurrencies' short life are the invention of: Bitcoin, Ethereum, and Cardano cryptocurrencies. Each invention came with improvements to the scalability factor, which is a weak point that cryptocurrencies have suffered since their early days. Scalability means the number of Transaction Per Second (TPS) that a cryptocurrency can process. A booming cryptocurrency should balance between the three triad blockchain trilemma. But

unfortunately, cryptocurrency designers had to choose only two out of the three factors from the blockchain trilemma when designing a new cryptocurrency. Most of the existing cryptocurrencies sacrificed scalability and increased decentralization and security factors. For example, Bitcoin achieved a decentralization factor by distributing users' information and data in multiple nodes connected to the blockchain networks. Also, Bitcoin achieved a security factor by implementing secure cryptographic hash functions well recognized by the IT security community, such as SHA-3. But Bitcoin still suffers from a scalability factor due to its transaction size initially designed by its founder S. Nakamoto. Since then, cryptocurrency designers have come up with different designs hoping to create the new world's dominant currency. Today, there are over 3000 cryptocurrencies in the market with different characteristics trying to balance the blockchain trilemma, [3]. The blockchain trilemma is presented in Figure 1.

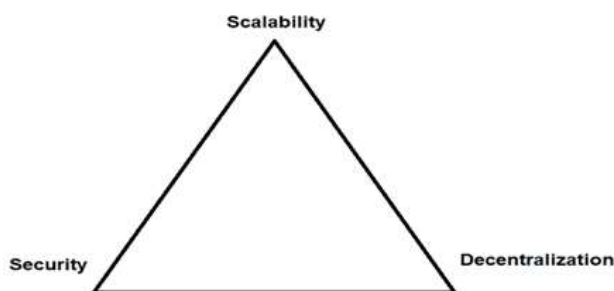


Fig. 1: The blockchain trilemma

1.2 Suspicious Authorities and Lack of Legal Framework

Scalability is not the only issue preventing Bitcoin from becoming a major payment currency. Governments and central banks have their genuine fears and suspicions leading them to be against or, at least find genuine difficulties in regulating cryptocurrencies, [4], [5]. Since its early days, Bitcoin, and its sibling cryptocurrencies, suffered from a lack of clear legal frameworks that accommodate its new monetary model.

Unlike traditional currencies that are issued and regulated by central banks, cryptocurrencies are decentralised in nature with no single authority controlling them. That means depriving central banks of a valuable utility they use today to control the economy and tackle its problems, like inflation for example. In addition, lacking authorities' control could enable malicious and criminal entities to evade their monetary transaction using decentralised cryptocurrencies, [6].

For that, most central banks have suspicions and negative views toward the new cryptocurrencies. In the best cases, cryptocurrencies are contending as trustworthy alternatives to sovereign currencies in weak economies. But in most developed countries, cryptocurrencies are working in a grey legal area, [7].

Using the blockchain in cryptocurrencies has its benefits like simplifying the transactions process, [6], [8]. Therefore, some central banks are encouraged to issue their sovereign cryptocurrencies and eliminate private money, like Bitcoin, from the economy, [9]. Such a move would mean losing the decentralisation feature of the current cryptocurrencies and, again, raise the issue of trust in sovereign cryptocurrencies that are managed by perhaps untrusted central banks. Still, central banks themselves are hesitant to advance in this move fearing that utilising the blockchain would introduce a direct link between the public and the central bank without the need for commercial banks in the middle. Eliminating commercial banks from the economy would change the way we use, lend, and borrow money in unexpected ways that might be destructive to the economy, [6].

1.3 Not Behaving as a Payment Currency

The lack of a legal framework creates a new dimension of challenges whether directly or indirectly. Any major currency should fulfill the requirements of money. These requirements include:

- 1) Serve as a medium of exchange.
- 2) Serve as a unit of account.
- 3) Serve as a storage of value.

Some researchers believe that Bitcoin largely fails to fulfill these requirements, [8], [10]. Among the reasons for this failure is being disconnected from the banking and payment systems, due to the lack of the legal framework as described earlier, [10].

[11], thought Bitcoin was behaving as a speculative asset rather than a major currency. They think that utilising an instant exchange marketplace is necessary to aid Bitcoin, or some other cryptocurrencies, to become a true major currency. Of course, such access to marketplaces would be limited due to the lack of legal governing frameworks.

Other researchers analysed the behaviour of cryptocurrencies, particularly Bitcoin, over the years and concluded that they are behaving more like an

asset, such as gold, [12], like a speculative investment, [4], [8], [12], or even like a bubble, [13]. That is understandable given the volatile nature of the cryptocurrencies which could give a good return on the investment. In other words, it is more rewarding to hold cryptocurrencies for longer rather than to use them in daily payment transactions.

An attempt to address these issues can be seen in a category of cryptocurrencies called stablecoins. The idea of stablecoin is built around the ability to fix the price of the cryptocurrency to a fiat currency, like USD. Therefore, users who are interested in using cryptocurrencies as a medium of payment are more attracted to using stablecoins instead of Bitcoin, [14]. The top stablecoin in terms of capital value is Tether, and it has the potential to be the major payment cryptocurrency of the future. A. Lipton, et. Al analysed this emerging category of cryptocurrencies with clear detentions and defined challenges and potential, [15].

1.4 Research Method

The literature is rich in research showing the limitations of Bitcoin and the challenges it is currently facing. It sounds inevitable that Bitcoin would not be the major currency of the future for day-to-day payment transactions due to its limited number of coins that cannot accommodate the ever-growing global economy. Nevertheless, among the thousands of current cryptocurrencies, there might be a currency that is fit to be the payment currency of the future. In this paper, we are not in a position to propose legal frameworks or monetary policies to reduce cryptocurrency volatility. Rather, the focus is only on the technical challenges described earlier. By developing a technically sound cryptocurrency, we are one step closer to convincing legislators in implementing an accommodating legal framework for cryptocurrencies, [5].

We conducted this preliminary research to analyse, review, and compare the top five leading cryptocurrencies based on their market cap value as of July 2020 to predict which one of them is set to be the major payment currency of the future. Our factors of comparison include speed, activity, decentralization, users, and community. We assign all these benchmarks an equal weight.

2 An Overview of the Top Five Leading Cryptocurrencies' Architectures

Table 1 briefly depicts an elevated comparison of the top five leading cryptocurrencies studied in this paper. This comparison provides readers with a first impression of the top five leading cryptocurrencies studied in this paper of the future monetary system around the globe.

2.1 Bitcoin

Bitcoin, [2], is the very first peer-to-peer decentralized distributed digital electronic cash cryptocurrency ever created in 2009 by S. Nakamoto. It allows money transfer directly from two parties without the interference of a third party or median financial institution, for ex., a bank. Bitcoin is operated in a blockchain network. In this protocol: every Bitcoin (BTC) transaction spent is validated, recorded, and then added to the ledger in order based on their arrival time. Validation is calculated through miners. Bitcoin miners are dedicated to solving a complex math puzzle to reach the desired hash value previously produced by the blockchain network. Proof of Work (PoW) is the energy nodes consume to solve the math puzzle initially produced by the blockchain network. The miner who solves the puzzle first before the other miners will be rewarded with a block reward. Sometimes, a mining pool "group of miners" who shares resources will distribute the reward instead of a single miner. Then, blockchain miners continue the transaction validation process, recording and adding them to a block. That means each block is composed of multiple transactions. And, of course, a group of blocks will form a chain of blocks called a blockchain. The newly added information to the blockchain is sent to all participants by the blockchain protocol to update their shared ledger. On the other hand, when the Bitcoin price increases, the block reward gets higher and incentivizes participants to join the network. As a result, the more miners join the network; the more secure the network will become since this increase will thwart attackers from controlling the network and achieve a 51% attack. In addition, more miners joining the network means more hardware needs to be purchased to win the fight for block rewards.

Table 1. An elevated comparison of the top five cryptocurrencies studies in this paper

	Bitcoin	Ethereum	Tether	Ripple	Bitcoin Cash
Native Coin	BTC	Ether	Tether	XRP	BCH
Consensus Mechanism	Proof of Work	Proof of Stake	Proof of authority	Proof of authority	Proof of Work
Market Cap (July 2020)	\$170.6 Billion	\$26.7 Billion	\$9.1 Billion	\$8.8 Billion	\$4.3 Billion
Main net Launch date	Jan 2009	July 2015	July 2014	2012	July 2017

2.2 Ethereum

Ethereum, [16], is the first alternative cryptocurrency created by V. Buterin in 2013. Ethereum is a decentralized peer-to-peer software platform that enables smart contracts and decentralized applications (DApps) to be built at the top of its blockchain. A smart contract is a self-computer program that behaves like a legal notice between two parties when their conditions are met and agreed upon. Currently, Ethereum uses the PoW system in its blockchain network. But Proof of Stake (PoS) is the system that will be used in Ethereum by late 2020, which enables miners to mine their next coin based on how many coins this miner holds (the more coins she/he holds, the more chance to mine the next new coin). PoS is less energy consumed compared to PoW. Like Bitcoin, validation, recording, and adding processes are identical to Bitcoin. Ether is the native currency used in the Ethereum blockchain. According to Ethereum, the source code of Ethereum can be used to “codify, decentralize, secure and trade just about anything.” Following the attack on the DAO in 2016, Ethereum was split into Ethereum (ETH) and Ethereum Classic (ETC). This paper will study and compare the native currency of Ethereum, ETH.

2.3 Tether

Tether, [17], is the first and most popular digital currency-defining stablecoins. Stablecoins tend to reduce and stop the volatility prices of most cryptocurrencies today. Launched in 2014, Tether describes itself as "a blockchain-enabled platform designed to facilitate the use of fiat currencies in a digital manner", [17]. Tether is designed by Tether Limited to reflect the U.S. dollar value and tends to become the official digital U.S. dollar recognized

globally by governments and individuals. On Jan. 8, 2020, Tether was the fourth-largest cryptocurrency by market cap, with a total market cap of \$4.6 billion and a per-token value of \$1.00, [18]. Tether consists of three stake layers which are depicted in Figure 2. Here is a review of each layer:

1) The first layer is the Bitcoin blockchain. Tether transactional ledger is embedded in the Bitcoin blockchain as metadata via the embedded consensus system, Omni.

2) The second layer is the Omni Layer protocol. Omni is a foundational technology that can:

a) Grant (create) and revoke (destroy) digital tokens represented as meta-data embedded in the Bitcoin blockchain; in this case, fiat-pegged digital tokens, tethers.

b) Track and report the circulation of tethers via Omnichest.info (Omni asset ID #31, for example, represents Tether USD) and Omnicore API.

c) Enable users to transact and store tethers and other assets/tokens in i:

i. p2p, pseudo-anonymous, cryptographically secure environment.

ii. open-source, browser-based, encrypted web wallet: Omni Wallet.

iii. multi-signature and offline cold storage supporting system.

3) The third layer is Tether Limited, their business entity primarily responsible for:

a) Accepting fiat deposits and issuing the corresponding tethers.

b) Sending fiat withdrawals and revoking the corresponding tethers.

c) Custody of the fiat reserves that back all tethers in circulation, [18].

d) Publicly reporting Proof of Reserves and other audit results.

e) Initiating and managing integrations with existing Bitcoin/blockchain wallets, exchanges, and merchants.

f) Operating Tether to a web wallet allowing users to conveniently send, receive, store, and convert tethers, [18].

Tether uses Proof of Reserves, (PoR) configuration is a novel system because it simplifies proving that the total number of tethers in circulation (liabilities) are always fully backed by an equal amount of fiat currency held in reserve (assets). In tether configuration, each tether USD in circulation represents one US dollar held in their reserves (i.e., a one-to-one ratio) which means the system is fully reserved when the sum of all tether's inexistence (at any point in time) is exactly equal to the balance of USD held in their reserve. Since tethers live on the Bitcoin blockchain, tethers' probability and accounting at any given time are trivial. Conversely, the corresponding amount of USD held in their reserves is proved by publishing the bank balance and undergoing periodic professional audits.

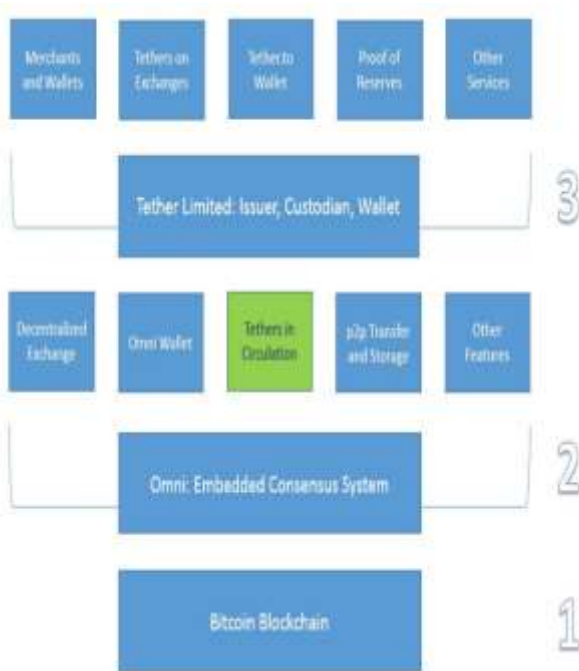


Fig. 2: Tether stake layers, [6]

2.4 XRP

XRP is a cryptocurrency that uses Ripple distributed open-source protocol created initially by Ripple Labs Inc. U.S.-based technology company by three designers: David Schwartz, Noah Youngs, and Arthur Britto. XRP is a unique cryptocurrency that does not need mining. It is a pre-mined cryptocurrency before its launch. That means there is no creation of XRP over time. It is supplied by the market network based on network guidelines. As a

result, XRP is a fast cryptocurrency that reduces high power consumption and network latency precipitated by mining. The Ripple Protocol consensus algorithm (RPCA) is applied every few seconds to network nodes. In each round, each server takes all new transactions called “candidate set” that was just initiated by the end-user of the server. Then, each server amalgamates this candidate set of transactions to its Unique Node List (UNL) and votes its veracity of all transactions. Lastly, transactions that receive more “yes” will be passed onto the next round “must agree more than %80 of yes votes of network nodes”, where the ones that receive less than %80 of votes will be either discarded or added to the candidate set of the next ledge. All transactions qualified that gain %80 of votes will be added to the new last-closed ledger. Ripple's founder team categorized the problems facing distributed payment systems into three issues: correctness, agreement, and utility. Correctness means a distributed system must differentiate between a correct and fraudulent transaction. In contrast, the agreement refers to the problem of maintaining a single global truth in the face of a decentralized accounting system. And utility is a slightly more abstract problem, which they generally define as the “usefulness” of a distributed payment system, but which, in practice, most often simplifies the system's latency, [19]. As of Jan. 8, 2020, Ripple had a market cap of \$9.2 billion and a per-token value of \$0.21, [20].

2.5 Bitcoin Cash

Bitcoin Cash (BCH) is a hard fork (updated code of the original Bitcoin code) by the Bitcoin blockchain community. The hard fork took place on 1 Aug 2017. The purpose of the hard fork is to increase the block size to 8 MB instead of the original Bitcoin size, which is 1 MB. The main idea of this amendment is to make the BCH blockchain network more scalable than the Bitcoin blockchain network and processes more transactions per second. As a result, BCH consumes less power with less network latency, which yields low transaction fees. BCH uses the PoW protocol system, just like Bitcoin. PoW stamps every new block generated by the blockchain network. The time needed to calculate a block is based on the difficulty of mining a blockchain network. Difficulty mining means that the blockchain algorithm can keep the block time constant in case of increasing and decreasing the number of participating nodes on the blockchain network. This algorithm is called the Difficulty Adjustment Algorithm or simply DAA. Adjusting

mining difficulty occurs every 144 blocks on the BCH blockchain network.

3 Comparison Between the Top Five Leading Cryptocurrencies

The top five leading cryptocurrencies must be compared via numbers to reach a subjective study. The criteria we will use in this study are based on the consensus protocol. We chose five main benchmarks evaluation factors, they are:

- 1) Speed measured in transactions per second.
- 2) Activity measured in average transactions per day.
- 3) Decentralization is measured in the number of active nodes.
- 4) Users are measured in the number of active accounts.
- 5) Community measured in the number of active developers.

3.1 Speed (Transaction Per Second)

One of the most important benchmarks is to measure how many transactions a cryptocurrency can perform per second. And this benchmark can be divided into two main branches: claimed and estimated TPS. This study will focus only on estimated TPS since it reflects a realistic TPS value of a cryptocurrency.

Estimated TPS means the actual and practical number executed by a cryptocurrency per second in blockchains today. For example, if a certain cryptocurrency can execute six transactions per 60 minutes, as shown in Eq. (1): $TPS = 6 \text{ transactions} / 60 \text{ seconds} = 0.1 \text{ TPS}$ (1)

Also, this number means this cryptocurrency can execute one transaction every 10 seconds. Transaction confirmation is the time it takes a cryptocurrency to confirm and settle a given operation. For example, Bitcoin completes seven transactions per second, but it might take up to one hour to ensure one operation. In other words, you might purchase and sell items using Bitcoin, so it might take up to one hour to confirm your operation. As a result, transaction time confirmation is different from the TPS concept. This paper estimates the TPS of the top five cryptocurrencies, as illustrated in Table 2 below.

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Table 2. Estimated TPS of the top five leading cryptocurrencies (July 2020)

	BTC	Ether	Tether	XRP	BCH
Estimated TPS	7	20	500	1500	300
Ranking	5	4	2	1	3

3.2 Activity (Average Transactions Per Day)

Activity is calculated by how many transactions are executed per day. And the average daily transactions reflect how many actions are happening in the blockchain network. Some blockchain communities consider activities executed by cryptocurrencies to be the actual value of blockchains. Table 3 below depicts the average daily transactions executed by the top five leading cryptocurrencies studied in this paper (July 2020).

Table 3. Estimated average transactions per day of the top five cryptocurrencies (July 2020)

	BTC	Ether	Tether	XRP	BCH
Average Transactions Per Day	350,000	1,000,000	800,000	802,766	14,000
Ranking	4	1	3	2	5

As Table 3. shows, Ether is the winner of achieving more average daily transactions than others. The first three winners (Ether, XRP, and Tether) obtained close numbers between each other where BTC is less than half the average transactions per day of the third position (Tether). Lastly, BCH obtained an extremely low average transaction per day value.

3.3 Decentralization (Number of Active Nodes)

Decentralization is distributing users' information, data, and authorities equally in multiple nodes connected to the blockchain networks. This study measures decentralization on how many active (live) nodes are connected to a blockchain network. This will reflect how the authorities, responsibility, and accountability are distributed among the various management levels of the blockchain nodes. The

more nodes connected to a blockchain network, the more decentralized it is. Table 4 illustrates the number of connected nodes in the top five leading cryptocurrency blockchain networks.

Table 4. Numbers of connected nodes of the top five cryptocurrencies (July 2020)

	BTC	Ether	Tether	XRP	BCH
Node Count	47,000	8,000	-	-	1304
Ranking	1	2	4	4	3

Table 4 shows the node count in each of the top five leading cryptocurrencies studied in this paper. BTC has more nodes connected to its blockchain than the others because it is the first-ever cryptocurrency launched on the market, so it earned the enormous trust of investors. Ether is the second large blockchain with nodes connected to its blockchain, with an enormous difference from BTC, which is 39,000 nodes. BCH has the least number among the lists. Tether uses proof of reserve as its consensus system. That means every Tether coin issued corresponds to one U.S. dollar. As a result, the number of nodes in Tether cryptocurrency is negligible in Table 4. That will affect Tether's decentralization network of becoming more centralized. XRP is a pre-mined cryptocurrency before its launch. That means there is no creation of XRP over time. It is supplied by the market network based on network guidelines. So, XRP's node count is also negligible here.

3.4 Users (Number of Active Accounts)

Active users connected to a blockchain network are measured in the number of active accounts. Below, Table 5 shows the active addresses of the top five leading cryptocurrencies studied in this paper. BTC achieved first place, having more active lessons than the others. Ether, Tether, BCH, and XRP cryptocurrencies reached the rest of the positions.

Table 5. Numbers of active addresses of the top five cryptocurrencies (July 2020)

	BTC	Ether	Tether	XRP	BCH
Active Addresses	1,000,000	520,000	203,776	6500	72,000
Ranking	1	2	3	5	4

As Table 5. shows the more active addresses the cryptocurrencies blockchain has, the more decentralized that network is.

3.5 Community (Number of Active Developers)

The community of each of the top five leading cryptocurrencies is measured in the number of active developers. Active developers reflect the acceptance of a blockchain network by the community. Consequently, the more active developers are building their apps at the top of a blockchain, for example. Bitcoin blockchain is the more decentralized and secure that network is. Below, Table 6. depicts the number of active developers of each of the top five leading cryptocurrencies studied in this paper.

Table 6 shows that BTC has 10478 decentralized applications (Dapp), and active users, while Ether has only two thousand Dapp active users. Tether, XRP, and BCH's Dapp daily active users' evaluation are negligible in Table 6. due to the specific protocols built into their network.

Table 6. Numbers of active developers of the top five cryptocurrencies (July 2020)

	BTC	Ether	Tether	XRP	BCH
Dapp Daily Active Users	10478	2000	-	-	-
Ranking	1	2	3	3	3

4 Discussion and Results

This section discusses the aggregated results from the subsections tables from the previous main section. Table 7 shows the final positions of the comparison of the top five leading cryptocurrencies based on the sum of numbers in ranking rows of Table 2, Table 3, Table 4, Table 5, and Table 6. Firstly, the numbers obtained from the ranking rows of the tables are summed. Then, the least number resulting from the summation is inserted in the compared cryptocurrencies' first position until the most significant sum number corresponding to the last position is reached.

Table 7 shows Ether cryptocurrency secured the first position to become the best of the top five leading cryptocurrencies in the market today. Where Bitcoin won the second position, Tether and XRP

were even and won the third position with equal points (15 each), while BCH deserved the last. The five benchmark evaluation factors studied and used in these papers made this comparison study more subjective since numbers are used to accomplish that. However, Ether is considered the second generation of cryptocurrency, which increases the TPS number of the first Bitcoin generation from 7 to 15 TPS. In other words, the scalability factor is developed while maintaining the same level of the other cryptocurrency trilemma, security, and decentralization.

One of the main reasons Ether’s investors trust this coin is the increasing number of decentralized applications that can be built at the top of Ether’s blockchain network. More precisely, Ether added a smart contract option to the blockchain industry, which made the Ether blockchain network more attractive. These facts increased the number of transactions performed in the Ether blockchain network. Which, in turn, raised the number of active addresses used in Ether’s blockchain network.

Bitcoin came in second position despite its popularity. TPS factor and not supporting the smart contract option of Bitcoin cryptocurrency are the two main reasons that made it behind Ether. But the Bitcoin blockchain network still has the most significant number of node counts (47K) and active addresses (1M) compared to others. More users connected to the Bitcoin blockchain network means a more decentralized blockchain network, so Bitcoin has the largest decentralized network containing the most significant number of Dapp daily active users (10K).

Stablecoins like Tether and XRP gained fifteen points each and secured the third position together. Tether and XRP are produced due to the market demand for stable price coins rather than price-volatile ones like Bitcoin, Ether, and BCH. In numbers, Tether and XRP have an average daily transaction of 800K and 802K, respectively. That means stablecoins cryptocurrencies like Tether and XRP increased the trust between investors and the market. But, as investors, the price stability of stable coins affects the low-profit margin compared to non-stable coins like Bitcoin since most stablecoins are tied to either gold or fiat currency. Tether has the second-best TPS (five hundred) among other cryptocurrencies on the studied list. Each Tether-coin is tied to one U.S. dollar fiat currency. That means the issuance of one Tether coin represents one fiat U.S. dollar. Along with the protocols built at the top of the Bitcoin blockchain

network, Tether reached many TPS in the limited, decentralized blockchain network.

XRP has the highest number of TPS but is not built at the top of any blockchain network and is a pre-mined coin. So, in our opinion, XRP is a more centralized coin, which explains its high TPS. BCH gained 18 points and deserved the last position of the top five leading cryptocurrencies studied in this paper. BCH performs 300 TPS better than BTC and Ether altogether. BCH used a lightning network as a second layer added to the Bitcoin original blockchain network, increasing the size of BCH’s block to 8 MB. And that’s why BCH’s TPS has increased tremendously from its original version, Bitcoin.

The current traditional payment system performs 1700 TPS. If cryptocurrencies want to compete with the traditional payment system, they must perform at least 1700 TPS or more. XRP is the nearest value (1500) TPS from the traditional monetary payment system. Cryptocurrencies need speed improvements to replace such a system. On the other hand, people need a non-volatile stable cryptocurrency that can gain their trust in daily payment usage. Ether-coin has these features but lacks TPS. As a result, researchers are still designing and testing new cryptocurrencies to produce a cryptocurrency that balances scalability, security, non-volatility, and decentralization.

Table 7. Aggregated results from the subsections tables (Tables 2., 3., 4., 5., and 6.)

	BTC	Ether	Tether	XRP	BCH
Estimated TPS	7	20	500	1500	300
Average Transactions Per Day	350,000	1,000,000	800,000	802,766	14,000
Node Count	47,000	8,000	-	-	1304
Active Addresses	1,000,000	520,000	203,776	6500	72,000
Dapp Daily Active Users	10478	2000	-	-	-
Number’s sum of ranking	12	11	15	15	18
Final positions	2	1	3	3	4

5 Conclusion and Future Works

This paper evaluated the top five leading cryptocurrencies today based on five benchmark evaluation factors: Speed, Activity, Decentralization, Users, and Community. Despite Bitcoin being the first cryptocurrency with the highest market cap, the result of this study placed Ether cryptocurrency in the first place, where Bitcoin, Tether, XRP, and BCH cryptocurrencies came behind, respectively.

The main goal of this study is to predict the best fit among the top cryptocurrencies today to compete with the traditional monetary system. Nevertheless, we admit that Ether, the chosen cryptocurrency, is still far away from replacing or even competing with the existing traditional payment system.

In the future, the authors of this paper plan to take this research in further directions. First, the preliminary evaluation benchmark needs fine-tuning and validation of the given weights. Further, it is hard for cryptocurrencies to replace the traditional monetary system worldwide without taking into consideration the needs of different groups and communities living in different regions of the world, especially the large Islamic Region. Therefore, the authors of this paper plan to explore the potential for designing and implementing a new cryptocurrency that balances scalability, security, decentralization, and non-volatility based on the best practices found in the evaluated cryptocurrencies. In addition, the authors would try to introduce the principles of the Islamic Economy in their proposal and study the expected effect on the benchmarks introduced in this paper. This intended cryptocurrency must fulfill Islamic regulations and monetary system regulations to be successful and recognized by Muslims and Islamic governments.

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Conflict of Interest

The authors have no conflict of interest to declare that is relevant to the content of this article.

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