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STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESIS (ES)

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

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THE STUDY OF CRYPTOCURRENCIES AROUND THE WORLD

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SHIV JYOTI CONVENT SCHOOL
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ABSTRACT

In this article, the author has given the detail about the origin of Cryptocurrencies and specially focussing on first cryptocurrency in the world. Bitcoin has emerged as the most successful cryptographic currency in history. Within two years of its quiet launch in 2009, Bitcoin grew to comprise billions of dollars of economic value despite only cursory analysis of the system's design. In my research, my main result was to discuss the various possibilities related to the market capturing of different Cryptocurrencies. I have given brief account of mining and the analysis of impact of Bitcoin and other Cryptocurrencies across the world. A general equilibrium monetary model is developed to study the optimal design of a cryptocurrency system based on a blockchain. The model is then calibrated to Bitcoin transaction data to perform a quantitative assessment of the scheme. Many Cryptocurrencies studies are included in this paper for better understanding.

KEYWORDS

cryptocurrencies, bitcoin.

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INTRODUCTION

Since the creation of Bitcoin in 2009, numerous private Cryptocurrencies have been introduced. Bitcoin is by far the most successful one. It has been getting a lot of media attention, and its total market value has reached 20 billion USD in March 2017. More importantly, a number of central banks started recently to explore the adoption of cryptocurrency and block chain technologies for retail and large-value payments. For example, the People's Bank of China aims to develop a nationwide digital currency based on block chain technology; the Bank of Canada and Monetary Authorities of Singapore are studying its usage for interbank payment systems; the Deutsche Bundes bank has developed a preliminary prototype for block chain-based settlement of financial assets. Many proponents believe that cryptocurrency and blockchain technology will have a significant influence on the future development of payment and financial systems. While policy makers concern about the opportunities and challenges brought about by these technological advances, there is very little guidance provided by economic theory regarding the appropriate usage of these technologies and the optimal design of these systems. This paper attempts to provide an economic theory to help us understand the fundamental economic trade and address relevant policy issues. Most existing models of Cryptocurrencies are built by computer scientists who focus mainly on the feasibility and security of these systems. This line of research often ignores the incentives of participants (e.g., the incentives of malicious attackers) and the endogenous nature of key variables (e.g., the real value of Cryptocurrencies). More importantly, to study the optimal design of a cryptocurrency system, we need to model from first principles the behaviours of divergent participants, to derive the equilibrium interactions among these agents and to study the optimal usage of divergent policy instruments. To this end, this paper develops a general equilibrium monetary model of a cryptocurrency system to study its optimal design. This approach is desirable because the model endogenizes the value of cryptocurrency, and endogenizes the underlying trading activities and mining activities. It also provides a welfare notion for assessing alternative system designs. We will use this model to evaluate the performance of a cryptocurrency system calibrated to Bitcoin transaction statistics. We will study the optimal design of the cryptocurrency system in divergent settings. Furthermore, we compare the usage of divergent consensus protocols on different aspects of Cryptocurrencies. Chiu and Wong (2015) apply the mechanism design approach to review several e-money technologies including Bitcoin, PayPal and M-Pesa and identify some essential features of e-money that can help implement constrained efficient allocations. Gans and Halaburda (2013) develop a model of platform management to study platform-specific digital currencies such as Facebook Credits. Fern_andez-Villaverde and Sanches (2016) model Cryptocurrencies as privately issued at currencies and analyze whether competition leads to efficiency. Agarwal and Kimball (2015) advocate that the adoption of digital currencies can facilitate the implementation of a negative interest rate policy. Rogo (2016) suggests subsidizing the provision of digital money to the unbanked in order to phase out paper currency, which facilitates undesirable tax evasion and criminal activities. To the best of our knowledge, our work is the first paper that explicitly models the distinctive technological features of a cryptocurrency system (e.g. blockchain, mining, double-spending problems) in an equilibrium monetary model and investigates its optimal design both qualitatively and quantitatively. Consider two opposing viewpoints on Bitcoin in strawman form. The first is that "Bitcoin works in practice, but not in theory." At times devoted members of the Bitcoin community espouse this philosophy and criticize the security research community for failing to discover Bitcoin, not immediately recognizing its novelty, and still today dismissing it due to the lack of a rigorous theoretical foundation. A second viewpoint is that Bitcoin's stability relies on an unknown combination of socioeconomic factors, which is hopelessly intractable to model with sufficient precision, failing to yield a convincing argument for the system's soundness. Given these difficulties, experienced security researchers may avoid Bitcoin as a topic of study, considering it prudent security engineering to only design systems with precise threat models that admit formal security proofs. We intend to show where each of these simplistic viewpoints fail. To the first, we contend that while Bitcoin has worked surprisingly well in practice so far, there is an important role for research to play in identifying precisely why this has been possible, moving beyond a blind acceptance of the informal arguments presented with the system's initial proposal. Furthermore, it is crucial to understand whether Bitcoin will still "work in practice" as practices change. We expect external political and economic factors to evolve, the system must change if and when transaction volume scales, and the nature of the monetary rewards for Bitcoin miners will change over time as part of the system design. It is not enough to argue that Bitcoin has worked from 2009– 2014 and will therefore continue likewise. We do not yet have sufficient understanding to conclude with confidence that Bitcoin will continue to work well in practice, which is a crucial research challenge that requires insight from computer science theory. To the second viewpoint, we contend that Bitcoin is filling an important niche by providing a virtual currency system without any trusted parties and without pre-assumed identities among the participants. Within these constraints, the general problem of consensus in a distributed system is impossible, without further assumptions like Bitcoin's premise that rational (greedy) behaviour can be modelled and incentives can be aligned to ensure secure operation of the consensus algorithm. Yet these constraints matter in practice, both philosophically and technically, and Bitcoin's approach to consensus within this model is deeply surprising and a fundamental contribution. Bitcoin's core consensus protocol also has profound implications for many other computer security problems beyond currency such as distributed naming, secure time stamping and commitment, generation of public randomness, as well as many financial problems such as self-enforcing ("smart") contracts, decentralized markets and order books, and distributed autonomous agents. In short, even though Bitcoin is not easy to model, it is worthy of considerable research attention as it may form the basis for practical solutions to exceedingly difficult and important problems.

OBJECTIVES

1. To explain every aspect regarding cryptocurrencies.
2. To get all the prominent cryptocurrency firms and their statuses.

RESEARCH METHODOLOGY

The study is primarily based on the secondary data.

ANALYSIS

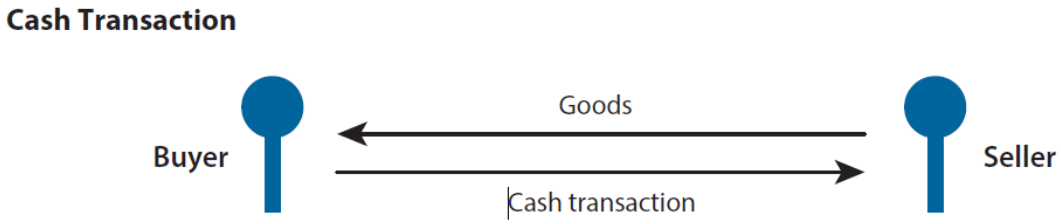
TRADITIONAL METHODS

CASH

Cash is represented by a physical object, usually a coin or a note. When this object is handed to another individual, its unit of value is also transferred, without the need for a third party to be involved. No credit relationship arises between the buyer and the seller. This is why it is possible for the parties involved to remain anonymous.

The great advantage of physical cash is that whoever is in possession of the physical object is by default the owner of the unit of value. This ensures that the property rights to the units of value circulating in the economy are always clearly established, without a central authority needing to keep accounts. Furthermore, any agent can participate in a cash payment system; nobody can be excluded. There is permission less access to it. Cash, however, also has disadvantages. Buyers and sellers have to be physically present at the same location in order to trade, which in many situations makes its use impracticable.

CHART 1



DIGITAL CASH

An ideal payment system would be one in which monetary value could be transferred electronically via cash data files. Such cash data files retain the advantages of physical cash but would be able to circulate freely on electronic networks.1 A data file of this type could be sent via email or social media channels.

A specific feature of electronic data is that it can be copied any number of times at negligible cost. This feature is highly undesirable for money. If cash data files can be copied and the duplicates used as currency, they cannot serve as a payment instrument. This problem is termed the "double spending problem."

ELECTRONIC PAYMENT SYSTEM

To counteract the problem of double spending, classical electronic payment systems are based on a central authority that verifies the legitimacy of the payments and keeps track of the current state of ownership. In such systems, a central authority (usually a bank) manages the accounts of buyers and sellers. The buyer initiates a payment by submitting an order. The central authority then ensures that the buyer has the necessary funds and adjusts the accounts accordingly.

Centralized payment systems solve the double spending problem, but they require trust. Agents must trust that the central authority does not misuse the delegated power and that it maintains the books correctly in any state of the world—that is, that the banker is not running away with the money. Furthermore, centralized systems are vulnerable to hacker attacks, technical failures, and malicious governments that can easily interfere and confiscate funds.

CRYPTOCURRENCY (BITCOIN)

Bitcoin is a virtual monetary unit and therefore has no physical representation. A Bitcoin unit is divisible and can be divided into 100 million "Satoshis," the smallest fraction of a Bitcoin. The Bitcoin Blockchain is a data file that carries the records of all past Bitcoin transactions, including the creation of new Bitcoin units. It is often referred to as the ledger of the Bitcoin system. The Bitcoin Blockchain consists of a sequence of blocks where each block builds on its predecessors and contains information about new Bitcoin transactions. The average time between Bitcoin blocks is 10 minutes. The first block, block #0, was created in 2009; and, at the time of this writing, block #494600 was appended as the most recent block to the chain. Because everyone can download and read the Bitcoin Blockchain, it is a public record, a ledger that contains Bitcoin ownership information for any point in time.

To use the Bitcoin system, an agent downloads a Bitcoin wallet. A Bitcoin wallet is software that allows the receiving, storing, and sending of (fractions of) Bitcoin units. The next step is to exchange fiat currencies, such as the U.S. dollar, for Bitcoin units. The most common way is to open an account at one of the many Bitcoin exchanges and to transfer fiat currency to it. The account holder can then use these funds to buy Bitcoin units or one of the many other cryptoassets on the exchange. Due to the widespread adoption of Bitcoin, the pricing on large exchanges is very competitive with relatively small bid-ask spreads. Most exchanges provide order books and many other financial tools that make the trading process transparent.

A Bitcoin transaction works in a way that is similar to a transaction in the Yap payment system. A buyer broadcasts to the network that a seller's Bitcoin address is the new owner of a specific Bitcoin unit. This information is distributed on the network until all nodes are informed about the ownership transfer.

For a virtual currency to function, it is crucial to establish at every point in time how many monetary units exist, as well as how many new units have been created. There must also be a consensus mechanism that ensures that all participants agree about the ownership rights to the virtual currency units. In small communities, as with the Yap islanders, everyone knows everyone else. The participants care about their reputation, and conflicts can be disputed directly. In contrast, within the Bitcoin system the number of participants is substantially larger, and network participants can remain anonymous. Consequently, reputation effects cannot be expected to have a significant positive impact, and coordination becomes very difficult. Instead, there is a consensus mechanism that allows the Bitcoin system to reach an agreement. This consensus mechanism is the core innovation of the Bitcoin system and allows consensus to be reached on a larger scale and in the absence of any personal relations.

BITCOIN MINING

To understand the consensus mechanism of the Bitcoin system, we first have to discuss the role of a miner. A miner collects pending Bitcoin transactions, verifies their legitimacy, and assembles them into what is known as a "block candidate." The goal is to earn newly created Bitcoin units through this activity. The miner can succeed in doing this if he or she can convince all other network participants to add his or her block candidate to their copies of the Bitcoin Blockchain.

Bitcoin mining is permissionless. Anyone can become a miner by downloading the respective software and the most recent copy of the Bitcoin Blockchain. In practice, however, there are a few large miners that produce most of the new generally accepted blocks. The reason is that competition has become fierce and only large mining farms with highly specialized hardware and access to cheap electricity can still make a profit from mining.

TABLE 1: TYPES OF PROMINENT CRYPTOCURRENCIES

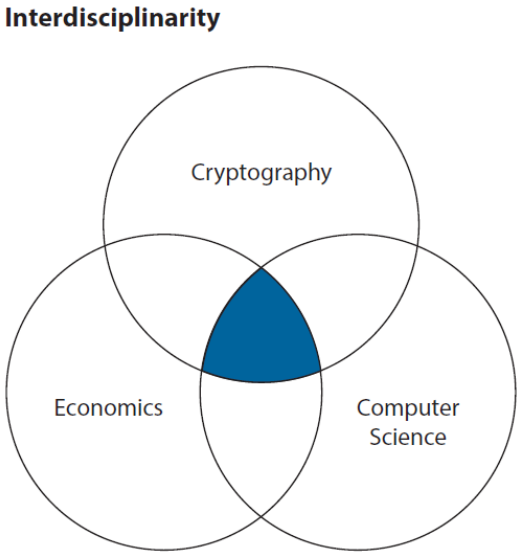
Release	Status	Currency	Symbol	Founder(s)
2009	Active	Bitcoin	BTC, XBT	Satoshi Nakamoto
2011	Active	Litecoin	LTC	Charlie Lee
2011	Active	Namecoin	NMC	Vincent Durham
2011	Active	SwiftCoin	STC	Daniel Bruno
2012	Active	Peercoin	PPC	Sunny King
2013	Active	Dogecoin	DOGE	Jackson Palmer & Billy Markus
2013	Active	Emercoin	EMC	Yitshak Dorfman
2013	Active	Feathercoin	FTC	Peter Bushnell
2013	Active	Gridcoin	GRC	Rob Hälford
2016	Active	Zcash	ZEC	Zooko Wilcox

BITCOIN TRANSACTION

The complexity of the present material is due to interdisciplinarity. To understand the Bitcoin system, it is necessary to combine elements from the three disciplines of economics, cryptography, and computer science. Having presented a broad overview of the Bitcoin system, we will explain a few technical elements of the system in greater detail. Blockchain uses proven technologies and links these in an innovative way. This combination has made the decentralized management of a ledger possible for the first time.

Berentsen and Schär (2017) argue that transaction processing demands that three requirements are satisfied: (1) transaction capability, (2) transaction legitimacy, and (3) transaction consensus. These three requirements will now be considered. In particular, we will explain how these conditions can be satisfied in the absence of a central authority.

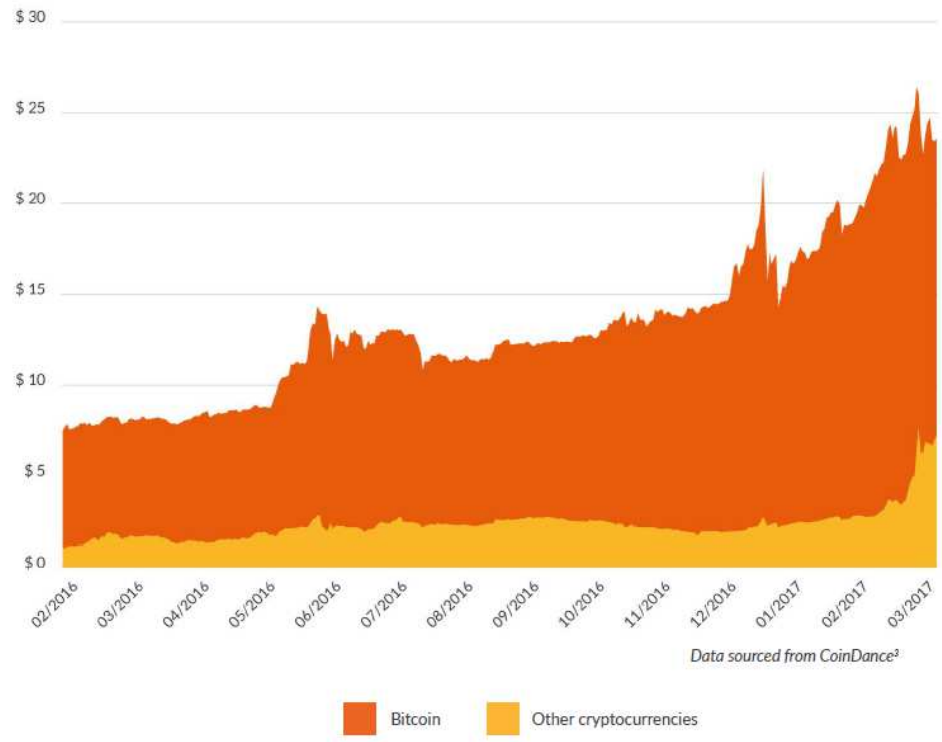
CHART 2



The common element of these different cryptocurrency systems is the public ledger ('blockchain') that is shared between network participants and the use of native tokens a way to incentivise participants for running the network in the absence of a central authority. However, there are significant differences between some Cryptocurrencies with regards to the level of innovation displayed (Figure 1). The majority of cryptocurrencies are largely clones of Bitcoin or other Crypto-currencies and simply feature different parameter values (e.g., different block time, currency supply, and issuance scheme). These Cryptocurrencies show little to no innovation and are often referred to as '*altcoins*'. Examples include Dogecoin and Ethereum.

The price of Bitcoin is highly volatile. This leads us to the question of whether the rigid predetermined supply of Bitcoin is a desirable monetary policy in the sense that it leads to a stable currency. The answer is no because the price of Bitcoin also depends on aggregate demand. If a constant supply of money meets a fluctuating aggregate demand, the result is fluctuating prices. In government-run fiat currency systems, the central bank aims to adjust the money supply in response to changes in aggregate demand for money in order to stabilize the price level. In particular, the Federal Reserve System has been explicitly founded "to provide an elastic currency" to mitigate the price fluctuations that arise from changes in the aggregate demand for the U.S. dollar. Since such a mechanism is absent in the current Bitcoin protocol, it is very likely that the Bitcoin unit will display much higher short-term price fluctuations than many government-run fiat currency units.

CHART 3



CONCLUSION

The Bitcoin creators' intention was to develop a decentralized cash-like electronic payment system. In this process, they faced the fundamental challenge of how to establish and transfer digital property rights of a monetary unit without a central authority. They solved this challenge by inventing the Bitcoin Blockchain. This novel technology allows us to store and transfer a monetary unit without the need for a central authority, similar to cash.

Price volatility and scaling issues frequently raise concerns about the suitability of Bitcoin as a payment instrument. As an asset, however, Bitcoin and alternative blockchain-based tokens should not be neglected. The innovation makes it possible to represent digital property without the need for a central authority. This can lead to the creation of a new asset class that can mature into a valuable portfolio diversification instrument. Moreover, blockchain technology provides an infra-structure that enables numerous applications. Promising applications include using colored coins, smart contracts, and the possibility of using fingerprints to secure the integrity of data files in a blockchain, which may bring change to the world of finance and to many other sectors.

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