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The Impact of Cryptocurrency on Traditional Financial Markets

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Abstract

The scientific and technological revolution 4.0 is changing the landscape of the economy and society. Blockchain and cryptocurrencies are among these powerful innovations. Recently, a wave of cryptocurrency investment has spread to countries around the world. The impact of cryptocurrencies is investigated in this thesis.

"Cryptocurrency" has started to become a buzzword. The growth of the market has made investors eager to participate. However, in order to minimize the risks when participating in this market, background knowledge about the market and cryptocurrencies is necessary. This thesis serves to help readers have the most basic judgments about the cryptocurrency market.

The thesis uses the appropriate method of analysis and synthesis. The definitions are given to help readers understand some basic knowledge about the financial market and cryptocurrency. Historical knowledge is also analyzed to provide a general overview of the development process of the market. The result that the author wants to bring is to help readers understand some basic content about the financial market and cryptocurrencies.

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1 Introduction

1.1 Background

Technological developments have brought great inventions, and one of the greatest is blockchain technology. Blockchain technology can revolutionize supply chains, healthcare, and IT infrastructure (Reiff 2021). A blockchain is what forms any cryptocurrency, but readers should note this thesis will not attempt to explain the technical side of how a blockchain works. Rather, it will focus on the financial side of cryptocurrencies. Not only the masses, even experts, businesses and governments are talking about cryptocurrency. Some coins (also a generally accepted term for cryptocurrencies) are very volatile and cause losses for investors. Cryptocurrency frauds, cryptocurrency Ponzi schemes have also been reported. Such incidents have raised the need for adequate research on the new phenomenon, and investors are beginning to manage their crypto portfolio right. Cryptocurrencies have created an unprecedented currency; thus, understanding what it is and what it does to the financial market is now practical.

The process of formation and development of cryptocurrency has a presence of Bitcoin - the first created cryptocurrency. Bitcoin made its first appearance in a White Paper by Satoshi Nakamoto in 2008 (Sharma 2021), though it is still unclear whether Satoshi was one single developer or a group of them. Bitcoin is a digital currency that is characterized as an electronic payment system based on cryptographic proof rather than trust. Complex cryptographic techniques based on open-source software are used to create the digital currency. They are solely traded on the internet and are not controlled by any individual, organisation or government. This is completely different from their government-issued counterparts such as the US dollar or euro. My intention when writing this thesis is two-fold: (1) to provide a basic level of knowledge on the cryptocurrency market, and (2) to build a future investment plan of my own.

The recent strong price fluctuations of cryptocurrencies on the world market have made the investment trend in virtual money bloom. This poses an urgent need to understand clearly the nature, reality, benefits and advantages and disadvantages of virtual money to have an accurate view of the development of this market. At the same time, the author has been investing in this market for a few years, having experienced unexpected price movements. The author wants to write a thesis on this topic to have the opportunity to learn more deeply about the market-related problems that the author is facing.

1.2 The aim of thesis

The ultimate goal of the thesis is to measure the impact of cryptocurrencies on traditional financial markets. In the process, readers will find a summary of how the traditional financial market was formed and then how cryptocurrencies came into play. Definitions of electronic money and many common cryptocurrencies are also included. General regulations on cryptos, countries that have accepted them and the role they play are also explored. In addition, I found it vital to dedicate one seperate section to outline illegal activities through cryptocurrencies trading. Case studies will also be provided to facilitate visualisation of the problems.

1.3 The scope of thesis

This thesis analyses cryptocurrencies in how they impact the financial market. Readers should expect to find knowledge at the basic level, which is sufficient to build the foundation for more in-depth analyses. To guide readers through the thesis, I organised the paper into four objectives. The first is the definitions and origins of cryptocurrencies. This preliminary part is important, as a clear understanding of cryptocurrency is required for the following sections. The second objective is to point out the advantages and disadvantages of the digital coins. This is done by analysing and extracting from published papers. The third objective is to study the traditional financial markets and regulations they have on cryptocurrencies. This is also where readers will find which countries accept the new currencies. The final objective, which is also the goal of the thesis, is to present the full picture of how cryptocurrencies affect the market. Examples and case studies will be given to make the thesis more realistic and understandable. The scope of the thesis is summarized in the following questions:

(1) What is cryptocurrency?

(2) What are the advantages and disadvantages of cryptocurrencies?

(3) What are the regulations regarding cryptocurrencies?

(4) What is the impact of cryptocurrencies on traditional financial markets?

1.4 Research method

The method used in the thesis is to focus on analyzing and synthesizing knowledge related to the topic. Published papers are a major source. The author also sourced tables and figures from reputable sites which guarantee their content. The data used is guaranteed to be authentic and reputable.

1.5 Outline

The thesis consists of nine chapters. It starts with an introductory chapter about the thesis, research purpose and method. Chapter two explains the key terms in the financial market such as Fiat money, SWIFT system, Gold standard and Bretton woods. Chapter three covers knowledge about cryptocurrencies, including their definitions and history. A list of popular coins will also be presented. Chapter four includes a SWOT analysis that shows the pros and cons of using cryptocurrencies. In Chapter five, acceptance status and regulations are analysed. Chapter six is a comparison between cryptocurrencies and stocks. In Chapter seven, the impact of cryptocurrencies on the financial market will be explored with the aid of real case studies. Illegal activities related to cryptos are covered in Chapter eight. The final chapter includes the conclusion.

2 Overview of the financial market

2.1 Traditional financial market

The smooth operation of capitalist economies is dependent on financial markets (Hayes 2022). Financial markets facilitate the transfer of funds from individuals, businesses, and governments (Mishkin 2012). The financial market is an environment for stabilizing and regulating money circulation, ensuring the stable and healthy development of the economy.

Financial markets make securities products profitable for those with excess funds (investors/lenders) while also making the money available to those who require additional finances (borrowers). In direct financial markets, funds are transferred directly from lenders to borrowers by means of securities, such as stocks, futures, ETFs, bonds, mutual funds and other financial instruments. In the indirect market, a financial intermediary will play an important role in facilitating the transfer of cash between surplus and deficit accounts. The main responsibilities of a financial intermediary are collection and risk management in lending, with a major focus on credit risk management. A well-functioning financial market improves the economic well-being of society (Mishkin 2012).

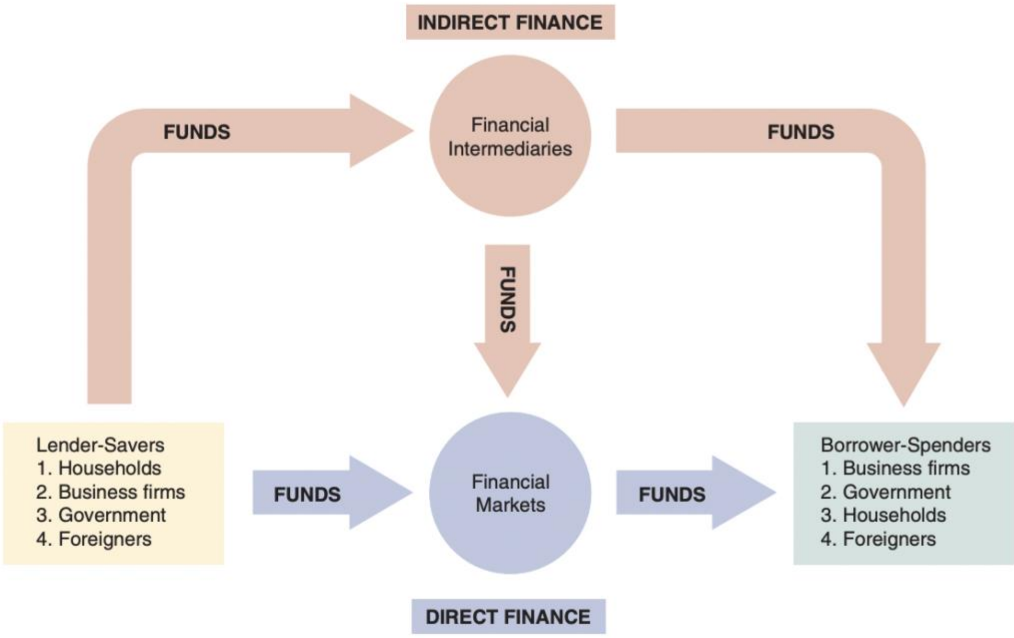


Figure 1. Flows of Funds Through the Financial System (Mishkin & Eakins 2012).

According to Figure 1, in direct finance, borrowers borrow directly from lenders through financial markets. This gives lenders profitable investment opportunities and borrowers the capital required. The financial market plays its role as a marketplace where borrowers and lenders meet, thereby improving the efficiency of the economy. The following example should help visualise the concept. Company A needs capital to develop a new product line. Company A issues bonds, and lenders buy the bonds. This means that Company A will pay back to lenders at a particular interest rate by a due date. Company A can now fund its business plan, and lenders will get back what they paid plus interest. In indirect finance, a financial intermediary will participate in the movement of capital. In most cases, a bank will play this intermediary part. The basic operation is for most parts the same as direct finance; the only difference is the involvement of a financial intermediary. The financial market is considered as one of the factors that initiate the market economy, creating the most favorable environment for entities to reconcile financial interests.

Financial markets are there for three main reasons. The first is to resolve the gap between the supply and demand for capital. The second is the ever-increasing needs to transfer, buy and sell securities between owners. The third is to provide a medium where more flexible forms of capital mobilisation can take place as the commodity economy diversifies. The primary function of financial markets is to link people so that money can flow to where it is most needed (Bank of England 2020).

Examples of financial markets are listed as stock market, over-the-counter market, bond market, money market, derivatives market, cryptocurrency market (Hayes 2022). Cryptocurrencies, decentralized digital assets are also included in the financial market. Cryptocurrency operating on blockchain technology - has appeared and started to gain popularity in recent years. Thousands of crypto tokens are currently available and exchanged on several independent online crypto exchanges around the world.

2.2 Gold standard

The formation of the monetary system is also a key point in the analysis of financial markets. The gold standard was once a regime used by many governments to, in a sense, determine how much money should be in circulation. From the 18th century, the gold standard began to be used in England, then spread to European countries and America. From the 1870s until the onset of World War I in 1914, the conventional Gold Standard prevailed (World Gold Council 2022). Currently, no country uses the gold standard system.

The gold standard is a system in which a country's currency is directly linked to gold in terms of value (Chen 2021). Countries fix the value of their currencies in gold, with no restrictions on purchases, and sell gold at a set price. The import and export of gold between countries is free to operate. The Gold Standard had certain limitations. The money supply would expand and inflation would rise as new gold mines were discovered. In addition, countries with a scarcity of gold were inherently handicapped in expanding the economy. During the Gold Standard spell, countries in economic deficit had to go through a period of stagnation, and those in economic surplus had to go through an inflationary period. After World War I, many economies experienced great difficulties. In September 21, 1931, Britain was forced to suspend the gold standard; it was a historic date (Kitson 2012). By the time World War II ended, the United States owned 75% of the world's gold (World Gold Council 2022). However, as the world economy gradually recovered, US gold reserves began to decline. Along with increased import demand, the United States experienced high inflation in the 1960s. In 1968, the United States and several European countries stopped selling gold on the world market, allowing gold prices to float in a free market, helping countries remove the pressure to value their currencies. However, economic competition with other countries accompanied by debts and expenses to pay for the Vietnam war put pressure on the US expenses. Towards the end of 1968, countries began to demand that the US allow them to exchange dollars for gold, forcing president Nixon to stop allowing the exchange of dollars to gold in 1971. By 1978, the Gold Standard officially collapsed. (Selgin 2012, 16-21.)

2.3 Bretton Woods system

Historically, The Bretton Woods system was a significant step forward in the development of the international monetary system. After the Second World War, the situation of European countries was devastated both economically and socially. The economic crisis has become more and more serious and caused many negative consequences. At this point, however, the economic potential of the United States is stronger than ever. The United States has become the financial and economic center of the world. The dollar was the only currency that was directly convertible to gold at the time (Lioudis 2022).

Faced with extreme urgency, in July 1944, a conference on a new international monetary system was held at Bretton Woods in the presence of representatives of 44 allied nations (The World Bank 2022). As a result of the conference, a new monetary system was established called the "Bretton Woods system". The Bretton Woods system linked all currency exchange rates, which were previously tied to the price of gold, to the price of the US Dollar (Chen 2022).

The conference also decided to establish two new organizations, which had an important influence on the entire monetary system. The first organization is called the International Monetary Fund, which monitors exchange rates. At the same time, this is also a place to help countries with budget deficits to borrow money. The International Bank for Reconstruction and Development was also established from this conference. The mission of this bank is to provide financial aid for post-war reconstruction and economic development in countries. (Ghizoni 2022, 1.)

According to the Bretton Woods system, countries establish their monetary policy by using the US dollar as the basis for pricing, while the US dollar is priced in gold at $35 = 1 ounce (Kenen 2008). Countries must commit to a responsible monetary policy that keeps their exchange rates fluctuating ±1% of par. After meetings between the countries, an important international agreement called the Bretton Woods Monetary System was built mainly on the basis of the US dollar. The Bretton Woods period is separated into two parts: the pre-transitional phase and the transitional phase (Bordo 1992, 3). The Bretton Woods system was a step forward in international financial relations and worked quite well for nearly 30 years. However, in the early 1970s, the US debts increased, and US gold reserves and the IMF could not guarantee the gold standard for the US dollar. The shutting down of the gold window on August 15, 1971 was considered by global monetary authorities as proof that the dollar was overvalued (Bordo, Humpage & Schwartz 2011). President Richard Nixon announced an end to the conversion of the US Dollar to gold in August 1971. At that time, US President Nixon implemented three emergency acts. The first is to stop gold transactions to protect the remaining gold reserves of the US. After that, the US implemented a 10% tax on all imports and introduced a 90-day wage policy and price freeze to manage US inflation. (Bordo 2019.) Despite all the efforts, the acts did not change the situation:

inflation was so high that the Bretton Woods system officially collapsed in 1973, allowing all currencies to float.

2.4 Fiat money

Fiat money refers to government-issued money that is not backed by tangible assets such as gold or silver. The formation and development of fiat money has made an important contribution and helped and supported the governments of many countries in the management of the monetary system. The value of the commodity does not control the value of the fiat currency (Chen 2022). The value of fiat money is decided by supply and demand, as opposed to commodity. Commodity money is made from precious metals like gold and silver, while promissory notes are a redeemable commodity (Institute of Corporate Finance 2022).

Most modern banknotes such as dollars and euros are fiat money. The origins of fiat money go back centuries in China. Initially, it was exchanged for silk, gold or silver. After that, European countries and the US also started experimenting with fiat money. To this day, fiat money is still officially used and has a certain value.

Throughout the 20th century, however, the United States restricted the use of commodity-based money. In 1972, under President Nixon, the United States abandoned the Gold Standard entirely, ending the system on an international scale, and transitioning to a fiat money system. (Federal Reserve History 1971.) The value of fiat money is based on usability. Fiat currencies are widely accepted around the world, and one can use them to buy almost any good or service. Currently, fiat money is used globally. Fiat money includes banknotes, coins, credits, loans or bonds. In some cases, if governments can print too much money, it can lead to hyperinflation and become a big danger. The money supply is influenced by the monetary base as well as the rate of circulation (Pettinger 2019).

2.5 SWIFT System

The Society for Worldwide Interbank Financial Telecommunication, or SWIFT for short, is a cooperative that facilitates safe and secure financial transactions. SWIFT does not conduct money transfers by itself, but supports member banks to transfer money to each other or exchange information. Whether individuals or organizations use different banks, they can still pay for transactions with SWIFT code. Each member organization will have its own SWIFT code. This code is capable of identifying the bank name, country, city and branch. SWIFT is a messaging network that allows financial organizations to send information and instructions securely using a standardized set of codes (Seth 2022).

In 2020, there were about 38 million transactions made every day through the SWIFT platform, worth trillions of dollars (Bergin 2022). SWIFT is subject to Belgian law and to European Union regulations. SWIFT routes money transfers from one bank to another, letting them know where the money is ultimately going. Money moving from one account to another often goes through multiple banks before reaching its final destination, especially if foreign currency is involved. SWIFT makes international trade, cross-border payments and international money transfers easier.

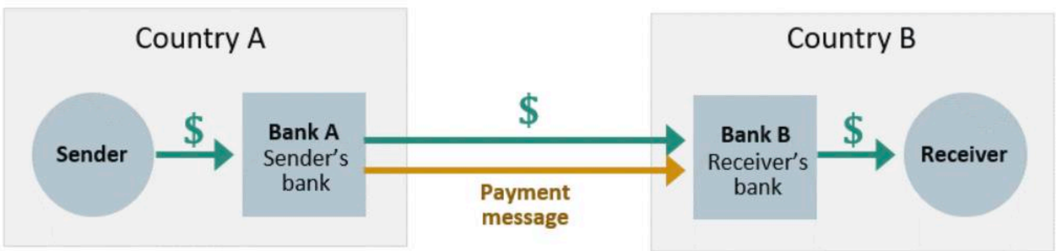


Figure 2. Cross-border Payment Process (Congressional Research Service 2021).

A cross-border transaction will include the sender, the sender's bank, the receiver and the receiver's bank. This transaction uses the SWIFT code to complete the transaction. As shown in Figure 2, the sender will send money to the recipient's account, including full information and SWIFT code. Once the SWIFT code is available, the bank determines to where the transaction is sent and then executes the transaction and sends a notification so that the recipient bank can verify and agree. The money will then go to the recipient's account. The SWIFT code makes this transaction fast and increases accuracy.

SWIFT provides each financial institution with a unique 8- to 11-character passcode. They can be SWIFT or BIC (Banking/Business Identifiers) codes or ISO 9362 codes (standard format of business identifiers). Each SWIFT code will have full information about the country, city, branch and bank name of each member. (American Commercial Bank 2022.)

SWIFT has a particularly important role which can affect the economy of a country. An example of the importance of SWIFT is the current state of Russian banks. When Russia invaded Ukraine, Russian banks immediately received sanctions and were removed from SWIFT. The Russian economy has suffered damage, making it almost impossible to participate in international financial transactions, which directly affects Russia's revenue comes from oil and gas profits (The Hague Centre 2022).

3 Overview of cryptocurrency

3.1 Definition of cryptocurrency

Cryptocurrencies are only available in encrypted form and not in physical form. Not only that, cryptocurrencies are stored and traded through designated software or smart deposit devices. There is no central authority responsible for managing and maintaining the value of cryptocurrencies (Ashford & Schmidt 2022). All transactions are carried out on the internet or through specialized networks and applications. The blockchain system is the core technological element that creates today's cryptocurrency. It does a perfect job of making sure the cryptocurrency is immutable, decentralized, and extremely transparent. That explains why cryptocurrencies are not controlled or issued by any government. Cryptographic breakthroughs are primarily responsible for the basis and foundation of digital assets.

In the virtual currency world, in addition to cryptocurrencies, there are also new types of blockchain products such as decentralized finance (DeFi), NFT or the Metaverse, etc. In the future, there will be some potentiel to develop cryptocurrency markets.

3.2 History of cryptocurrency

Blockchain technology is the beginning of the formation and development of cryptocurrency. Blockchain algorithms have created momentum for transactions of cryptocurrencies. Each coin is understood as a file stored in a digital wallet. Archived files are operated from person to person thanks to blockchain.

Programmer(s) under the name Satoshi Nakamoto designed The Bitcoin protocol; it was released as open-source software in 2009. Bitcoin is gaining traction among those who need to transmit money across borders without being regulated by banks or governments (Guardian Nigeria 2021). Within only one year, from 2009 to 2010, nearly 100 other digital currencies were created. By far, Bitcoin is still the most famous and valuable cryptocurrency. Thousands of alternative cryptocurrencies besides Bitcoin, collectively known as Alt (short for altcoins), have different functions or specifications. Cryptocurrencies are built on complex algorithms, operating on the basis of blockchain data technology. Blockchain is like a giant public ledger listing all transactions validated by a globally connected computer system. As of March 2022, there are over 18 000 cryptocurrencies in existence (Coinmarketcap 2022).

3.3 Common cryptocurrencies

In recent years, cryptocurrency investment has been a topic of much discussion on financial forums and social platforms. With the rapid development of the cryptocurrency market, more and more different types of cryptocurrencies have been created.

3.3.1 Bitcoin (BTC)

Bitcoin is a cryptocurrency that was proposed in 2008 and enjoyed a lot of success throughout its formation and development stages. Bitcoin (abbreviated as BTC) is known as a decentralised digital currency, meaning it is based on blockchain technology and does not depend on intermediaries. This means that Bitcoin is not officially protected or recognized by governments in some countries around the world. Bitcoin is encrypted in the form of an open source code for direct exchange by internet-connected devices. The transactions are peer-to-peer (Nakamoto 2008).

Peers are computer systems connected via the internet in a peer-to-peer network. The buying/selling takes place directly between the sender and the receiver on the internet without going through a server in the process and without anyone participating as an intermediary. Satoshi Nakamoto is the name that comes up the most when someone asks who created Bitcoin. Currently, there is no proof that Satoshi is a person or an organisation. Bitcoin has 14 years of existing and development. As of May 5, 2022, the price of 1 BTC was $39,630.88 (Coinmarketcap 2022).

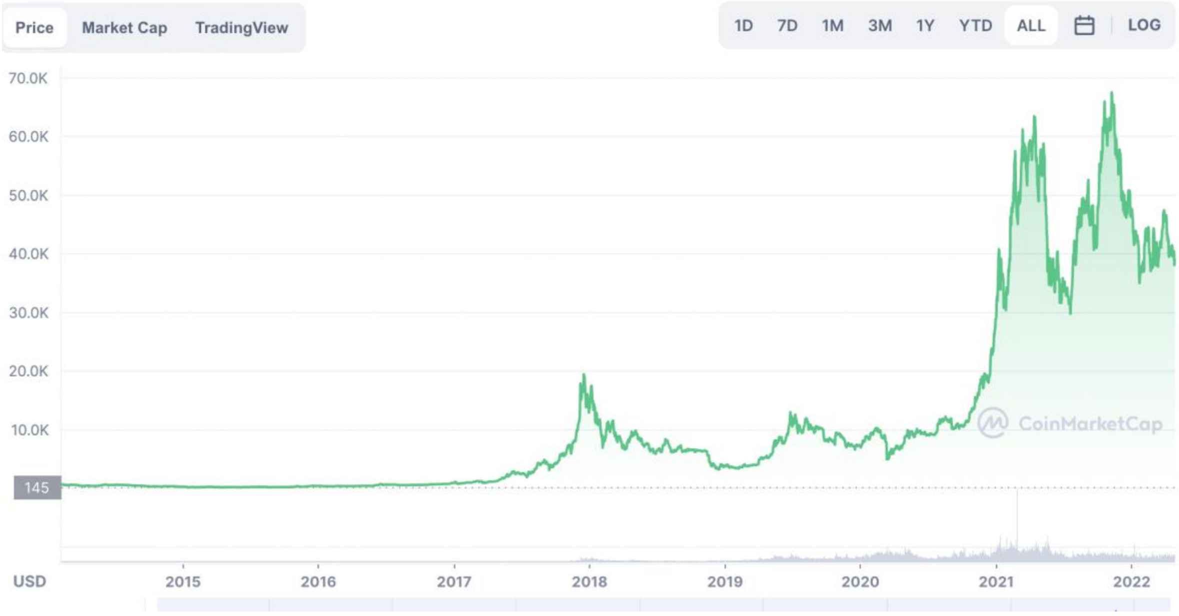


Figure 3. Bitcoin Price from 2015 to 2022 (Coinmarketcap 2022)

According to Figure 3, we can see the spectacular growth momentum of BTC. After the correction from $10,000 to below $4,000 (March 2020), Bitcoin started a strong bull cycle and reached an ATH at $69,000 (Coinmarketcap 2021). Bitcoin is a prime example of an open blockchain. It does not require government clearance, and anybody can join or leave the public Bitcoin network at any moment (Lewis, McPartland & Ranjan 2017).

3.3.2 Ethereum (ETH)

Ethereum, abbreviated as ETH, is the second largest cryptocurrency after Bitcoin. It's a decentralized blockchain platform that creates a peer-to-peer network for securely executing and verifying application scripts (also known as smart contracts). It is similar to a smartphone operating system on which software apps may be developed. (EY 2022, 4.)

In June 2015, the first block of Ethereum was successfully mined, marking the official formation of the Ethereum Blockchain. In 2016, Ethereum crashed hard fork, resulted in the division of Ethereum into: Ethereum and Ethereum Classic. In 2016, an Ethereum blockchain program was hacked and stolen about 3.6 million ether (ETH) – worth about $50 million at the time (Reynolds 2021).

Ethereum's core developers elected to undertake a hard fork in order to remove the hack from the ledger and refund the assets to their rightful owners. Hard forks are significant modifications to blockchain algorithms and coins (Juneja 2022).

Ethereum not only acts as a cryptocurrency and store of value, but the decentralized Ethereum network can also create and run applications, smart contracts, and other transactions on the Blockchain network. The history of all these smart contracts is stored in the Ethereum blockchain. The number of Ethereum tokens is unlimited. According to a May 5, 2022 report, one ETH is currently priced at $2,945.94 (Coinmarketcap 2022).

Figure 4. Ethereum price from 2016 to 2022 (Coinmarketcap 2022).

ETH also shares a similar price trend to Bitcoin because ETH is also affected by Bitcoin's price swings. Overall, the ETH price is on a strong upward trend.

3.3.3 Tether (USDT)

The Omni layer protocol is used to issue USDT (Tether coin) on the Bitcoin Blockchain. Each USDT unit has a reserve of 1 USD and can also be redeemed on the Tether platform. USDT is operated, spent and stored similarly to all other virtual currencies. All these properties make it ideal for users to transact currencies between different countries, replacing current insecure wallet transactions and audits. USDT in circulation will always equal USD in Tether Limited. To ensure transparency about the amount in the account, Tether Limited has published the bank balance at the Transparency website. Auditors will regularly confirm and update this report. Tether is a stable cryptocurrency, the price of which does not fluctuate much compared to other cryptocurrencies.

Figure 5. USDT Price from 2016 to 2022 (Coinmarketcap 2022).

Updated on May 5, 2022, one USDT was worth 1 dollar. USDT is a stable coin, USDT price is always around 1 dollar. Because of this feature, investors often use USDT for the purpose of converting money or as an intermediary to trade other coins.

3.3.4 Dogecoin (DOGE)

Dogecoin (code: DOGE) is a decentralized cryptocurrency based on the source code of Litecoin. Dogecoin uses the dog face Shiba Inu (temporarily called the Doge meme) as its official name and logo. At first, many people thought this was just a joke from the founder when the value for money was very low. However, Dogecoin became a viral craze and increased in value many times over. Dogecoin has no limit on the number of coins issued. At this point, the number has risen to over 129 billion units. DOGE was born solely for the purpose of decentralization and development based on the foundation of Litecoin.

Figure 6. Dogecoin price from 2015 to 2022 (Coinmarketcap 2022)

Dogecoin received huge support from Elon Musk, founder of Tesla. The value of this coin is greatly influenced by Elon Musk's Tweets. Every one of his events or Tweets can cause the coin price to increase rapidly. "The total transaction flow that you do with Dogecoin in transactions per day has a much higher potential than Bitcoin" (Musk 2021). Just a short Twitter sentence, Elon Musk was able to change the direction of the coin's price. This shows that cryptocurrencies are heavily dependent on the "sharks" - the big investors of the market.

4 Advantages and disadvantages of using cryptocurrency

4.1 SWOT Analysis

Cryptocurrencies have certain advantages and disadvantages in their use. A SWOT analysis will consider more about the strengths, weaknesses, opportunities and threats of cryptocurrencies.

Strength	Weakness
Assets are digitized. Fast transaction. Low transaction fees. E-commerce industry development. Transparency in Peer-to-Peer transactions.	Difficult to predict: The value range of cryptocurrencies is huge. Risk of crime. Systemic risk. Legal doubts. The market is still in the development stage.
Opportunity	**Threat**
Solve inefficiencies in banking and payments. There is the potential to fill the gap in current financial technology and can help solve traditional banking problems.	Barriers to Adoption: Many countries have not accepted cryptocurrencies. Hackers attack to steal cryptocurrencies. There are also competitors to cryptocurrency that are attempting to

It can act as a sort of commodity.	provide an alternative to digital currency. The lack of knowledge on understanding cryptocurrency.

Table 1. SWOT analysis of cryptocurrencies

This is a preliminary analysis of the strengths, weaknesses, opportunities and challenges in using cryptocurrency. Based on the above table, it can be seen that cryptocurrencies have many weaknesses in terms of security. The market is developing, so there are still many weaknesses and challenges for cryptocurrencies. For a more detailed analysis of the disadvantages and benefits, sections 4.2 and 4.3, which provide more rigorous arguments.

4.2 Advantages

Cryptocurrencies are designed to evade control by regulators or third parties, reducing transaction costs. In recent years, when buying something, paying with cryptocurrency has also become more convenient. One of the other highlights of cryptocurrencies is convenience: the ease of storage and the ease of use. Since cryptocurrencies are digital currencies, all funds are kept in an application or hardware wallet, or even stored online. Cryptocurrencies will make it easier to send money between two people without the use of a third party (Nakamoto 2008, 1 -3).

Transaction fees are not exorbitant, and money will be transferred directly from one person to another without going through any intermediaries. In addition, the transaction costs are extremely low. Compared with transactions through banks, which have high conversion fees and long transaction processing times, cryptocurrencies have a distinct advantage. Regular cryptocurrency transactions are processed extremely quickly. The security of these transactions is also quite high because all information about the trader will be kept confidential in an anonymous form.

Cryptocurrencies are a tool to eliminate inflation. Satoshi Nakamoto (2008), the creator of Bitcoin, set the top limit at exactly 21 million. Therefore, Bitcoin will not see the phenomenon of mass cloning. If the fiat currency of countries is issued too much, surpassing the value of manufactured goods, its consequences are inflation or currency devaluation. Cryptocurrencies are issued based on algorithms and are pre-programmed with limited supply, so it can reduce inflation. One advantage of cryptocurrencies over fiat money is that they cannot be counterfeited. Cryptocurrencies use blockchain technology in combination with many other consensus mechanisms integrated in algorithms to build a complete protocol.

All transactions and information about cryptocurrencies are public on the blockchain. No individual or organization can interfere and govern bitcoin because its protocol is encrypted and built on a decentralized network. This is precisely the reason for the transparency of the Bitcoin cryptocurrency.

4.3 Disadvantages

Cryptocurrencies are always a hot topic of discussion,so the pros and cons of using cryptocurrencies have also been analyzed by many experts and investors. In some countries, the use of cryptocurrencies is encouraged by the government, while in others the use of cryptocurrencies is prohibited and viewed as illegal. It is these legal questions that have caused cryptocurrencies to lose the trust of many investors.

Cryptocurrencies operate under the decentralized mechanism of Blockchain, which means that transactions can be carried out without the existence of a central bank coordinating their activities. It is because of this decentralization that there is no central bank to mediate all transactions and no centralized party or government to enforce its value. The value of a coin is determined by the value investors place on it. This makes the price highly volatile; the price can go up and it can also drop rapidly and unpredictably. Since there is no government regulation, the price of a cryptocurrency is so fragile that it can depreciate completely if something goes wrong.

The risk of data loss and hacker attacks is quite high. Cryptocurrencies are held in digital wallets protected by digital passwords. When losing the digital password, the risk of losing the wallet is very high. Not only individual accounts but also major exchanges can be hacked by hackers (Redman 2019).

All activities related to cryptocurrency trading can be anonymous. So this is a loophole for criminals to operate. The legality of using virtual currency is also important as it can cause trouble for investors. In countries with a ban on cryptocurrencies, engaging in trading these currencies despite the ban can also face related legal problems. The cryptocurrency market is relatively new compared to the traditional markets. This means that the market is still in the development phase. Market stability has not been established. The change of the market in the future is also affected by many objective and subjective reasons.

5 Regulation

5.1 Acceptance and legal status

Cryptocurrencies are widely traded in many countries around the world, with a focus on developed regions such as North America, Eastern Europe, and Asia. According to CoinMarketCap, the value of all the bitcoins in the world was over $1.65 trillion as of May 5, 2022 (Coinmarketcap 2022). The total value of the cryptocurrency market has reached amazing milestones. Out of all cryptocurrencies today, Bitcoin has the highest market capitalization. This is also very understandable since Bitcoin was the first cryptocurrency to be created and already has a strong place in the cryptocurrency rankings. Bitcoin’s value is currently 41.52% of the cryptocurrency market value (Coinmarketcap 2022). Each country has a different reaction to the development of virtual currency. Currently, Bitcoin is not officially recognized as a currency in most countries around the globe. The character of cryptocurrencies does not match the way traditional markets work. The International Monetary Fund (IMF) is concerned that cryptocurrencies like Bitcoin can pose a lot of risks to both investors and the economy. According to the IMF, national regulators should work to have common rules globally, strengthen cross-border surveillance, and as this is a new field, push for data standardization. Because of its extremely fluctuating value, Bitcoin does not work well as a daily transactional medium of exchange (Prasad 2022). To date, price volatility has remained limited inside crypto-asset markets, with no overtaking or threat to the robustness of broader financial markets and infrastructures. Financial stability risks may arise as crypto-assets are increasingly integrated with the broader financial system, especially without a proper regulatory framework and oversight. The development of digital cryptocurrencies is an inevitable trend. The current cryptocurrency market still has many limitations in terms of both system structure and security policies. Improvement and development are necessary to build a safe and secure market. Whether accepting it or not, countries still have to come up with management methods to ensure the stability of the financial - monetary system and the interests of the people.

The management and use of electronic money as a means of payment depends on the laws of different countries around the world. The first country to legalize Bitcoin was El Salvador. El Salvador has made Bitcoin legal tender, allowing it to be used as a medium of exchange for goods and services (World Economic Forum 2021). The country's adoption of Bitcoin has made a particularly big impression on the world. This impression mainly comes from the fact that this is a small country that was the first to accept Bitcoin. Public opinion from other countries will be both negative and positive. According to El Salvador's President Nayib Bukele, accepting Bitcoin will make it easier for their citizens abroad to send money back home.

There are countries that are at the forefront of information technology in the world; they neither accept cryptocurrency nor ban it. They only put in place policies to collect taxes and measures to monitor and reduce the possibility of smuggling or money laundering. There is a group of countries that reject cryptocurrencies although they do not ban cryptocurrency transactions. These governments have an unfriendly view of this currency. Finally, there are countries that completely ban the use and trading of cryptocurrencies. The level of bans in these countries also varies and depends on many factors. The Library of Congress (LOC) published a report "Regulation of Cryptocurrency Around the World" conducted in 2018. It analyzes regulations of more than 130 countries around the world regarding cryptocurrencies (LOC 2018). The document was subsequently updated in November 2021. Both the 2018 and 2021 data sections were used for analysis in this chapter. A clear change in three years can be seen from the data.

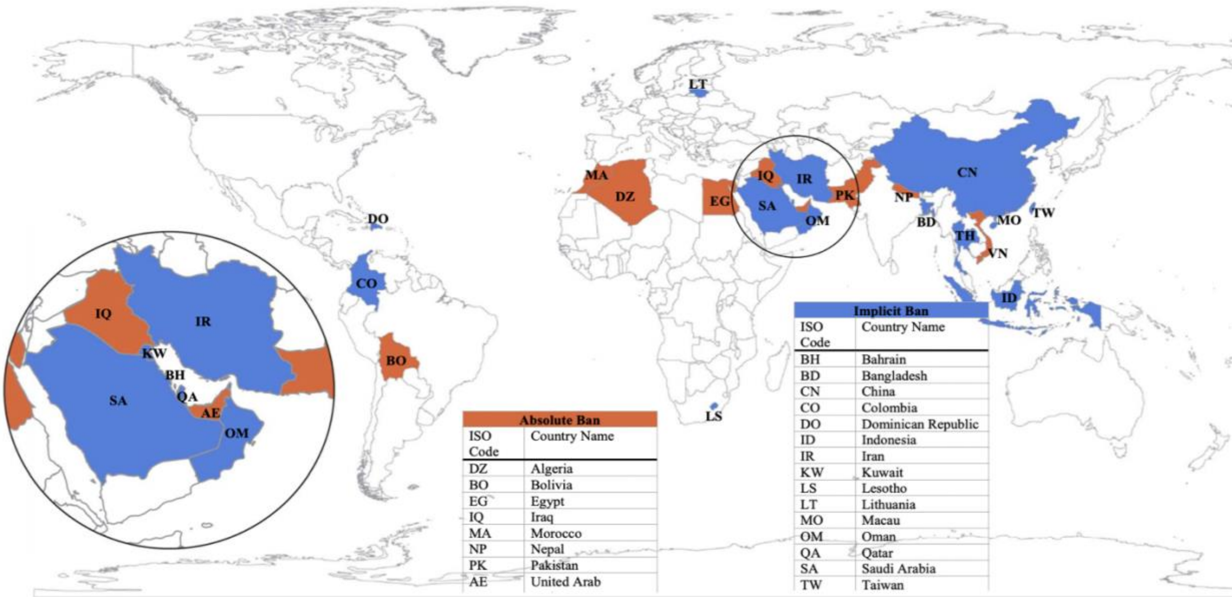
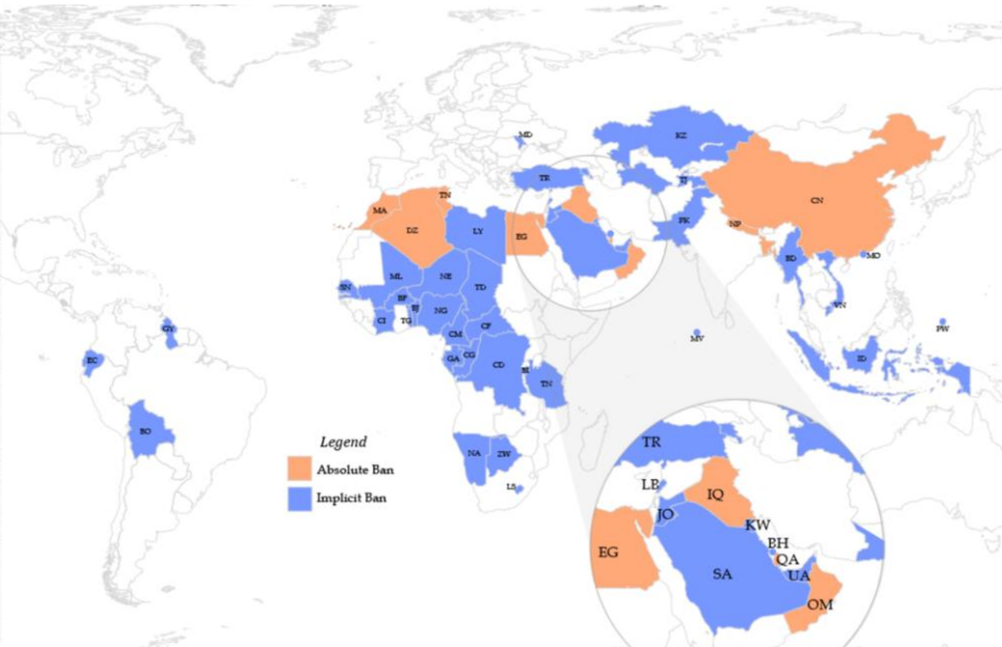


Figure 7. Legal Status of Cryptocurrencies (Law Library of Congress 2018).

Based on the research of Law Library of Congress, Figure 7 has been compiled showing the countries that ban and implicitly ban cryptocurrencies. Countries that are completely banned include Algeria, Egypt, Bolivia, Iraq, Morocco, Nepal, Pakistan, and the United Arab Emirates. In countries that completely ban the transactions and use of cryptocurrencies, crypto-related activities are considered illegal. All crypto activities are tightened and banned completely. According to studies, according to these countries, the ban is to maximize the protection of the national currency and the interests of investors. Besides the countries that have a complete ban, there are still countries that only have a tacit ban. The implicit bans are put in place to limit cryptocurrency-related transactions at exchanges, banks and other financial institutions. In addition to 8 countries that completely ban, there are 15 countries that have implicit bans (Law Library of Congress 2018).



Country names	ISO Code
ALGERIA	DZ
BAHRAIN	BH
BANGLADESH	BD
BENIN	BJ
BOLIVIA	BO
BURKINA FASO	BF
BURUNDI	BI
CAMEROON	CM
CENTRAL AFRICAN REPUBLIC	CF
CHAD	TD
CHINA	CN
CONGO	CG
CÔTE D'IVOIRE	CI
DEMOCRATIC REPUBLIC OF CONGO	CD
ECUADOR	EC
EGYPT	EG
GABON	GA
GEORGIA	GE
GUYANA	GY
INDONESIA	ID
IRAQ	IQ
JORDAN	JO
KAZAKHSTAN	KZ
KUWAIT	KW
LEBANON	LB
LESOTHO	LS
LIBYA	LY
MACAO	MO
MALDIVES	MV
MALI	ML
MOLDOVA	MD
MOROCCO	MA
NAMIBIA	NA
NEPAL	NP
NIGER	NE
NIGERIA	NG
OMAN	OM
PAKISTAN	PK
PALAU	PW
QATAR	QA
SAUDI ARABIA	SA
SENEGAL	SN
TAJIKISTAN	TJ
TANZANIA	TZ
TOGO	TG
TUNISIA	TN
TURKEY	TR
TURKMENISTAN	TM
UNITED ARAB EMIRATES	AE
VIETNAM	VN
ZIMBABWE	ZW

Figure 8. Legal Status of Cryptocurrencies (Taylor 2021).

According to Figure 8, there are a number of countries that have changed from complete bans to implicit bans, such as Algeria, Bolivia and Pakistan. There are some countries which changed from implicit bans to complete bans of cryptocurrencies. In the 2018 report, only 15 countries implemented implicit bans, but in 2021 there were 42 countries. These countries have stepped up activities to limit the ability to trade cryptocurrencies (Law Library of Congress 2021). According to the statistics of the Law Library of Congress, the number of countries with implicit bans has increased significantly in just three years from 2018 to 2021

China restricted financial institutions from trading cryptocurrencies and prohibited all cryptocurrency mining in the nation. The Chinese Government is particularly concerned about the environmental impact of cryptocurrency mining, as well as people who use digital currencies for fraud and money laundering (Brokee 2021). The issuance of a complete ban on cryptocurrencies by China was considered an important event at the time, as China is one of the largest cryptocurrency markets in the world. China's ban dealt a heavy blow to investors and sparked global interest in cryptocurrencies. The Chinese Government believes that the virtual currency business has contributed to an increase in gambling, fraud and other illegal activities. The ban on cryptocurrencies is imperative to maintain social stability and national security (Brokee 2021).

5.2 Regulatory Framework

The development of blockchain and cryptocurrencies is necessary, because it is completely in line with the change of times and technological improvement. It is because not all countries in the world have negative thoughts about cryptocurrencies and their application in economic transactions and social activities. There are a number of countries that have not officially legalized cryptocurrencies as a currency, but they still allow citizens to participate in cryptocurrency transactions. Separate legal frameworks for cryptocurrencies have been developed and adjusted by countries to suit the actual situation. According to the U.S. Library of Congress (2018), these frameworks include tax, anti-money laundering and counter-terrorism financing laws.

Cryptocurrency transactions are profitable for investors; therefore, tax laws were enacted. The Internal Revenue Service (IRS) in the United States has classified cryptocurrencies as property rather than foreign money for tax reasons. If it is utilized in a transaction, its worth is evaluated at its fair market value in US dollars at the time of the transaction. The difference in value between when it was bought and when it is spent is subject to capital gains tax (IRS 2014, 5-7). Over the next few years, tax policy and financial legislation around cryptocurrencies will undoubtedly change. Even if there is a capital loss, all cryptocurrency traders must declare each trade or sale as a taxable event. Tax laws will depend on the regulations of each government.

Anti-Money Laundering and Anti-Terrorism Financing laws have also received exclusive attention. Cryptocurrencies have the advantage of being easily exchangeable on a global scale. Because it operated by blockchain and through peer-to-peer transactions. Blockchain is a decentralized, unchangeable database that allows businesses to record transactions and track assets without going via a central authority (IBM 2022). Therefore, it has become an effective channel for criminals to take advantage of legal loopholes to carry out illegal acts. Criminals can easily convert funds obtained through illegal activities into "clean" money or channel terrorist financing through the sale and exchange of virtual currencies in different countries. As a result, some governments have incorporated anti-money laundering and anti-terrorist funding legislation into their cryptocurrency regulatory structure.

Anti-money laundering (AML) refers to a system of rules, regulations, and procedures aimed at detecting attempts to mask unlawful transfers as legitimate earnings (Kenton 2022). The ways that criminal organizations take advantage of vulnerabilities to carry out money laundering activities include the following steps. First, criminals will introduce this illegal money into the financial system by buying cryptocurrency. They will then trade with various accounts so that the money is moved around to create confusion. In this way, they were able to legitimize the flow of money, switching to "clean money". This action facilitates crimes such as drug trafficking and terrorism. This directly affects the global economy. The US, UK and Europe are focusing heavily on AML enforcement, targeting financial institutions and high-growth sectors such as cryptocurrencies and exchanges. AML will be a big focus for law enforcement and law enforcement agencies over the next few years. (Roberts, Grieve, Chandhok & Glaser 2021.)

Terrorist financing is the act of mobilizing and supporting money and properties in any form for terrorist organizations or individuals. Countries must adhere to the standards for money laundering prevention and combat, as well as terrorism and terrorist financing prevention and combat.

An effective framework must prevent, detect and punish illegal acts such as deliberately driving illegal money into the financial system, financing terrorism. A person commits the crime of financing terrorism "whenever that person distributes or collects funds with the aim or knowledge that they will be used, in whole or in part, to carry out" an offense within the scope of the Convention by any means, directly or unfairly and deliberately (UN Office on Drugs and Crime 1999).

Application of Tax Laws		AML & ATF Laws		Both Laws	
ISO Code	Country Name	ISO Code	Country Name	ISO Code	Country Name
AR	Argentina	KY	Cayman Islands	AU	Australia
AT	Austria	CR	Costa Rica	CA	Canada
BG	Bulgaria	CZ	Czech Republic	DK	Denmark
FI	Finland	EE	Estonia	JP	Japan
IS	Iceland	GI	Gibraltar	CH	Switzerland
IL	Israel	HK	Hong Kong		
IT	Italy	IM	Isle of Man		
NO	Norway	JE	Jersey		
PL	Poland	LV	Latvia		
RO	Romania	LI	Liechtenstein		
RU	Russia	LU	Luxembourg		
SK	Slovakia	SG	Singapore		
ZA	South Africa	KR	South Korea		
ES	Spain				
SE	Sweden				
GB	United Kingdom				

Source: The Law Library of Congress; http://www.law.gov
AML: Anti-Money Laundering; ATF: Anti-Terrorism Financing Laws

Figure 9. Regulatory Framework for Cryptocurrencies (Law Library of Congress 2018).

According to the Law Library of Congress report (2018), the list of countries with tax laws and anti-money laundering/terrorist financing laws has been fully disclosed. Most countries in Europe applied these laws to their crypto-related regulatory frameworks. As shown in Figure 9, the countries that use both laws include Australia, Canada, Denmark, Switzerland and Japan. The research also cites 13 nations that have enacted anti-money laundering and anti-terrorist funding legislation to regulate cryptocurrency use. There are 16 countries that have adopted tax laws for cryptocurrencies in 2018. In general, the application of these laws into the legal framework is the right decision for the above countries, which not only helps them to limit legal loopholes but also protects national security. (Law Library of Congress 2018.)

5.3 The adoption of crytocurrency – Case: Vietnam

Vietnam is a country that does not accept cryptocurrencies as fiat money. According to Official Letter 5747/NHNN-PC, the state affirmed that cryptocurrency is not a money nor a legal means of payment in Vietnam. Issuing, supplying, and utilizing virtual currency in general, and Bitcoin and Litecoin in particular, as a currency or means of payment, is illegal (State Bank of Vietnam 2017).

Cryptocurrencies started appearing in Vietnam. The Vietnamese Gorvernment does not have the official legal framework for cryptocurrency. In 2017, FPT University announced that it would accept foreign students to pay tuition fees in Bitcoin (VnExpress 2017). This created a strong wave of talk about cryptocurrencies and Bitcoin. However, this announcement of FPT University went against the laws that the government had mentioned. Therefore, this notice of FPT has been cancelled. The government has responded by introducing sanctions for illegal declaration, issuance and provision of means of payment that will be administratively sanctioned.

Due to the strong development of cryptocurrencies, there are many cryptocurrency trading activities occurring everyday. The anonymous transactions are difficult for the goverment to check if there are any illegal activities such as money laundering, tax evasion, etc. Regarding the effectiveness of monetary policy, Vietnam’s legal system has implemented its own management policies.

Although the Vietnamese Government does not accept cryptocurrency as an official currency or means of payment, the number of Vietnamese people participating in investing in this market is very large. Despite the state's recommendations on risks to the cryptocurrency market, many investors are still reluctant to participate.

Country	Index score	Overall index ranking	Ranking for individual weighted metrics feeding into Global Crypto Adoption Index		
			On-chain value received	On-chain retail value received	P2P exchange trade volume
Vietnam	1.00	1	4	2	3
India	0.37	2	2	3	72
Pakistan	0.36	3	11	12	8
Ukraine	0.29	4	6	5	40
Kenya	0.28	5	41	28	1
Nigeria	0.26	6	15	10	18
Venezuela	0.25	7	29	22	6
United States	0.22	8	3	4	109
Togo	0.19	9	47	42	2
Argentina	0.19	10	14	17	33
Colombia	0.19	11	27	23	12
Thailand	0.17	12	7	11	76
China	0.16	13	1	1	155
Brazil	0.16	14	5	7	113
Philippines	0.16	15	10	9	80
South Africa	0.14	16	18	16	62
Ghana	0.14	17	32	37	10
Russian Federation	0.14	18	8	6	122
Tanzania	0.13	19	60	45	4
Afghanistan	0.13	20	53	38	7

Figure 10. Global Cryptocurrency Adoption Index (Chainalysis 2021).

Based on Figure 10, we can see that Vietnam tops the list of countries where people want to accept cryptocurrencies the most out of 154 countries (Chainalysis 2021), even though the government does not accept them. The above ranking is made using the following values:

(1)On-chaincryptocurrencyvaluereceived

(2)On-chainretailvaluetransferred

(3)Peer-to-peer(P2P)exchangetradevolume

The results obtained from these data are truly astounding. Vietnam has an extremely high number of crypto transactions. Peer-to-peer platform is driving and creating momentum in emerging markets, including for all Vietnamese people with a new awareness of the cryptocurrency market and starting to invest. This is a good sign, but it is also risky because the knowledge base about cryptocurrencies is not yet widespread in Vietnam. Investment waves are mostly "imitation" without any necessary knowledge. The state needs to soon complete the legal framework on cryptocurrencies, strengthen the management, and strictly control related cryptocurrency trading activities.

6 Comparision between cryptocurrencies and stock markets

A comparison between cryptocurrencies and a long-established investment such as stocks is a good way to clarify the characteristics of this emerging crypto market.

	Cryptocurrency	Stocks/ Shares
History	Cryptocurrencies appeared in 2008-2009, which shows the nascent of this market. In December 2020, Bitcoin had over 330,000 daily transactions, with 400,000 in early January 2021 (Statista 2022).	Stocks have been around for a long time in history. In 1661 in Amsterdam, the first Stock Exchange was created, this is a milestone for the establishment and development of the stock market (Hwang 2021). New York Stock Exchange Is the largest stock exchange in the world, with an average of 2.4 billion shares traded every day (Devlin 2022).
Price volatility	The market is still very new, not stable yet, so the fluctuation range is very high. The character of the market is quite fragile because it depends heavily on large investors. Big investors or sharks have the ability to	Stock exchanges have low price fluctuations. Low range means a more stable market. The large trading volume creates the stability of the stock market. Stock exchanges can be affected by geopolitical events

	dominate the market. A good example is Elon Musk, who holds a lot of Dogecoin, just one of his Tweets can affect the price of Dogecoin.	because of the impact from the Government and large companies.
Regulation	Not universally recognized by law.	Managed and controlled by state management agencies and subject to the provisions of law
Scams and risks	Lack of safety due to no guarantee from the government, not yet legally recognized. The theft of personal data and security codes often occurs. In addition, there are also fake tokens, without any value, just empty tokens to deceive investors.	Although it is managed by a competent authority, it is not immune to account security risks. Waves of stock price hype are also frequent. The biggest risk is that the company goes bankrupt and the market crashes.
Trading fee	Cryptocurrency exchanges have lower costs than brokers on stock exchange	Stock exchanges are strictly regulated and ensure a level playing field. There are exchange fees, broker fees
Trading time	The bitcoin cryptocurrency market operates 24/7	Trading is only possible from Monday to Friday, the opening and closing times of exchanges are subject to other factors.

Profit	Profits may vary depending on the market. Due to the high volatility, there is a possibility of high profit. But the market has not reached a stable level, so the possibility of going to 0 and losing everything is quite possible.	The market is stable, so profits will not grow rapidly in a short time. The market requires patience. However, the securities are strictly regulated, so the probability of losing all the invested money is quite low.

Table 2. The key differences between crypto and stocks

Table 2 provides a simple comparison of the characteristics of the cryptocurrency and stock markets. This comparison seems disproportionate because securities are an investment type recognized and regulated by an authority, while cryptocurrencies are a relatively new market and have not yet received regulatory approval. However, in general, these two markets also have similarities and differences to analyze and compare.

7 The impact of cryptocurrency

7.1 Price crashes of Bitcoin

Bitcoin is the largest cryptocurrency at the moment, so the rise and fall of this cryptocurrency will affect the trends of others. Bitcoin's sudden price spikes and drops have had a huge impact on cryptocurrency markets and cryptocurrency investors. The worldwide economy was embroiled in a recession after the global economic crisis erupted in 2008-2009. Bitcoin, based on Blockchain block data technology, was born in that setting, marking a watershed moment in human financial technology. At that time, the price of Bitcoin only reached 0.00076 USD on October 5, 2009 (Coinmarketcap 2022). The Bitcoin price has reached $39,655.10 on May 5, 2022 (Coinbase 2022) During its more than 10 years of development, Bitcoin had unexpected price drops, although the market rallied after that but still left a significant mark.

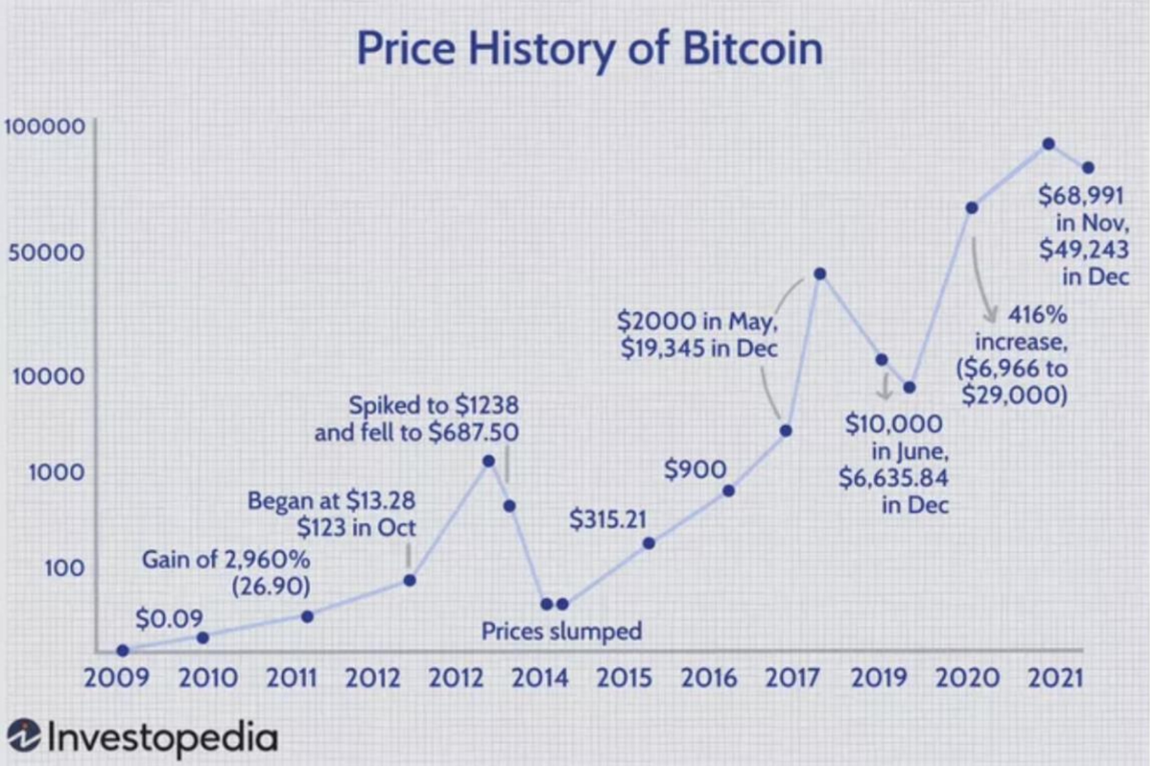


Figure 11. Price History of Bitcoin (Jiang 2022)

Bitcoin's price movement is evident in Figure 11. An unstable growth has followed throughout Bitcoin's price correction. Bitcoin rallied again on April 13, 2011, from $1 to a peak of 29.60, up 2,960% within three months. In 2012, there was a heavy meltdown in the crypto market: the price suddenly dropped nearly 50%. After that, the market recovered and there were continuous ups and downs, but mostly in the direction of growth. Bitcoin peaked on 10 November 2021, at a price of $68,990.90 1 BTC, which is the highest peak recorded in history. Currently, the Bitcoin price has dropped almost 50% from its peak. (Coinmarketcap 2022.)

These data are taken from the Bitcoin price chart at Coinmarketcap.com during development. Over the past 10 years, Bitcoin has had four rapid price drops (more than 80% down from its peak). The first major drop in 2011 was also the most severe drop in Bitcoin's history (-93.8%). The reason for this price drop is because a user claimed to have stolen 25,000 Bitcoins. The coin dropped sharply and bottomed out at $2, although it was previously priced at $32. This was a really deep drop in prices that lasted until 2013. After breaking out of the bubble in November 2011, Bitcoin welcomed two strong rallies to $259 on April 10, 2013. Then there was a drop to $50 but after only a few months, the Bitcoin price pushed to a new high of $1,163 on November 30, 2013. This rally is due to the power of the media that has favored a lot of news about crypto. Once a peak is reached, a bearish wave is bound to appear. The wave of declines this time extended to the bottom in 2015. It was not until 2017 that the Bitcoin boom began. This was a brilliant milestone for Bitcoin when it peaked at $19,666. This was followed by a bubble burst when the Bitcoin price returned to $3,220 (83.6% decrease). After each peak, there will be a decline. This is how the market works. Each burst of the Bitcoin bubble has left small investors in fear. In addition, unexpected increases and decreases also affect the cryptocurrency market.

7.2 Cryptocurrrency affects financial markets

The analysis of financial markets has been analyzed in Section 2.1. Cryptocurrencies are also participants in financial markets, so issues related to cryptocurrencies also impact the financial markets. As analyzed in previous chapters on the benefits and disadvantages of cryptocurency, the appearance of Bitcoin has caused many concerns and risks for users. Bitcoin being traded on the market includes coins bought from exchanges and mined coins. Bitcoin "mining" has started to increase in America. Since China announced a ban on cryptocurrencies, bitcoin mining in China has gradually shifted to the US. As of April 2021, the United States accounted for over 17 percent of total of all bitcoin miners in the globe, up 151 percent from September 2020 (Sigalos 2021). However, Bitcoin mining is harmful to the environment, consumes a lot of electrical energy and has an impact on climate change (Goodkind, Jones &

Berren 2020). In recent years, Bitcoin miners have also used more sophisticated machines and equipment.

Transactions in cryptocurrencies are highly anonymous, so criminals have taken advantage of them to carry out illegal acts, drug trafficking, tax evasion and illegal property payments. These illegal activities upset financial markets that already have many problems to deal with. However, thanks to the decentralized nature of cryptocurrencies, it received more attention when Russia started attacking Ukraine. The European Union (EU), the United States, the United Kingdom and Canada have issued deviations of sanctions against Russia. Russian banks will be "disconnected" from SWIFT, the global payment information system used by banks to conduct cross-border monetary transactions (Likos 2022). The presence of cryptocurrencies has helped Russia solve the problem at hand: Russia is still able to transact through cryptocurrencies. During the war, it has been difficult to withdraw money at ATMs, so electronic money has won favor to help people easily convert money. This is a positive impact from cryptocurrencies on people's lives.

Lessons learned from previous monetary systems will be the foundation for cryptocurrency development to officially receive recognition. Cryptocurrencies have been around in the financial markets for more than a decade; they have proven their role in the financial markets. Crypto-assets are already part of the financial markets. Their excessive price volatility could jeopardize financial stability, especially in countries where cryptocurrency use is widespread. As a result, it's past time to create a worldwide regulatory framework that would guide national legislation and oversight while also addressing the crypto ecosystem's financial stability concerns (Adrian, Iyer & Qureshi 2022).

Cryptocurrencies and markets have an interlinked relationship from two sides, so both sides can have an impact on each other. This means that positive or negative market news can also affect cryptocurrency prices. Investor sentiment and news are the factors driving the impacts of cryptocurrencies.

8 The illegal activities related to cryptocurrencies

8.1 Ponzi schemes

A Ponzi scheme is an investment scam in which existing investors are granted fictitious profits using the money of new investors. Organizers of Ponzi schemes may entice new investors by promising to engage in opportunities that promise huge returns with little or no risk (The U.S. Securities and Exchange Commission 2022,1). Ponzi schemes are named after Charles Ponzi – an Italian scammer living in North America who became very famous after coming up with this asset scam model.

Figure 12. How Ponzi schemes work (Gurneet 2020).

A cryptocurrency Ponzi scheme functions in the same way that a regular Ponzi scam does. To entice investors, a fake advanced rate of return is used, many new investors will be drawn into the scam. After that, the scammers will disappear from the market. Scammers convince people to invest money by promising high returns. Investors start by encouraging their friends and colleagues to invest as well. The most suitable target for this model is community groups (Moneysmart 2022) because crowd psychology affects a lot.

8.2 Money laundering

Money laundering is a way that criminals convert illegal money (dirty money) into legal money (clean money). Through illegal activities, criminals can earn a huge amount of "dirty money". By concealing the illegal origin of this money, criminals enjoy these profits without jeopardizing their source (the financial Action Task Force 2022).

Cryptocurrencies are increasingly being used in money laundering operations, and numerous criminal networks used them as a payment medium during the COVID-19 pandemic (Europol 2021). Money laundering networks provide services to other criminal networks, such as the purchase or trading of cryptocurrencies, the legalization of criminal assets, and the ultimate cash out of criminals' accounts (Europol 2021, 12).

Criminals can perform extremely sophisticated behavior: they process bitcoins concealing the source, then split the transfer into smaller payments that are transacted at once. This practice becomes legalized after they exchange assets operating through purchasing intermediaries on popular websites.

Money laundering through Bitcoin transactions is becoming more and more common. In previous years, there have been major money laundering cases such as the Chinese Bitcoin Exchange OKCoin. During the investigation of the fraud, the law enforcement agencies recovered most of the laundered funds, and OKCoin was responsible for compensating 40% of the total amount that investors and related parties suffered. (Gautham 2016.)

In the US, Bitcoin BitInstan was also involved in money laundering for the company's customers. The exchange's CEO helped clients sell over $1 million in bitcoins used in drug purchases (Pagliery 2014). Cases related to money laundering will incur very heavy legal penalties because it affects not only the economy but also national security.

8.3 Crypto hack

Many hackers take advantage of the anonymity of cryptocurrency transactions to infiltrate exchanges and steal investors' wallets. Virtual currency exchange attacks not only investors' assets but also reduce the reputation of businesses. Hackers perform illegal acts for themselves to appropriate other people's property. Most of the incoming virtual currency exchanges do not guarantee 100% security against hackers. Hackers can attack exchanges or other online platforms to steal user information and then get that information to break into their accounts on the exchange. Cybersecurity is very important: it keeps exchanges and investors protected from hackers.

The Ronin hack was one of the biggest crypto thefts ever. Thousands of people were affected by this attack. Ronin Network, a platform that powers the popular game Axie Infinity, was hacked, and the thieves took cryptocurrency valued over $615 million (Tidy 2022). This is just the latest in a string of mass crypto thefts that have occurred. According to the statistics of Coinmarketcap 2022, many hacks cause unfortunate financial losses. An example is the Poly Network Hack (August 10, 2021) which caused a loss of 610 million USD; Hack Coincheck (January 26, 2018) with a loss of 534 million USD; Hack the Mt. Gox from late 2011 to February 2014 with a total lost asset value of $610 million; Hack KuCoin (September 25, 2020) with a lost asset value of $610 million. There are still attacks from hackers with a total value of billions of dollars. (Kartsey 2021.) Measures to ensure security and enhance network security are a priority to combat hackers in the cryptocurrency markets.

9 Conclusion

The theoretical part of the thesis mentioned key points focused on analyzing the historical factors of the subject. Theories on the monetary system, Gold Standard, Bretton Woods, SWIFT were briefly explained, including the main ideas and related historical issues. History is not about memorizing information, but about following and evaluating arguments and synthesizing them to draw usable conclusions. The dilemma will be illuminated by an examination of historical causality - how change occurs in society and how individuals think (History Standards 1996). The author uses the analysis of the market history to better understand the important milestones of the market.

The focus of the thesis is still on cryptocurrencies and their effects on financial markets. The idea and issuance of cryptocurrency is an inevitable creation under the push of a science and technology platform. The formation and development of cryptocurrencies are due to the needs of the market, the key factor in this market is people. People want to find a new form of money, a new playing field. The fact that Satoshi Nakamoto created the whitepaper for cryptocurrencies, and applied blockchain to Bitcoin is a remarkable milestone for the information technology industry. Cryptocurrencies are still being entangled in many doubts about the level of risk and the legitimacy, as well as the ability to develop.

Humans started from primitive times with basic survival skills after going through evolution and scientific and technological revolutions. Now, people are reaching the heights of science and technology. The fourth science and technology revolution emphasizes achievements in artificial intelligence, machine learning, biotechnology, blockchain. The superiority of Bitcoin is based on its unique electronic technical characteristics. The comparison of the benefits and disadvantages of cryptocurrencies also show the strengths and weaknesses that need to be overcome. An object always has two opposite sides parallel to each other. Both good and bad sides of the subject need to be focused on and carefully considered. Cryptocurrency is also a much discussed topic regarding the potential for development, mining issues related to the environment, security capabilities and privacy. The worldwide cryptocurrency market is anticipated to grow by 12.8 percent between 2021 and 2030, from $1490 million to $4940 million in 2030 (Goswami, Borasi & Kumar 2021, 5). The market's development opportunities are predicted to increase in the future. However, the disadvantages of using cryptocurrencies are also highlighted in many reports from some financial organizations. The key point to these disadvantages is the increasing number of countries that have banned and tacitly banned cryptocurrencies.

The regulations of each country on cryptocurrencies are different. Each country has its view and orientation. In general, the ultimate goal is still to develop the national economy and ensure national sovereignty. Regulations are considered and built to help the management become tight and minimize loopholes. Acceptance or disapproval of cryptocurrencies depends on the strategy of the government. If the development of cryptocurrencies can benefit the people and the country, it will be accepted, except in cases of kleptocracy (Meriam Webster 2022), when a certain state or government intentionally takes advantage of cryptocurrencies to steal all the people's resources. This is condemnable.

It seems that the majority of investors in cryptocurrencies do not have a good understanding of the financial markets. Investment decisions are mainly influenced by the psychology of the crowd. Not doing any research before entering this market is extremely dangerous. The pitfalls and investment risks are countless; even a small mistake can cause investors to lose money. To prepare before starting to enter this market, new investors must grasp at least the knowledge of cryptocurrencies and know how to classify valuable and unvaluable coins.

Jumping into the market without any knowledge is like jumping into the deep sea without knowing how to swim. The lucrative bait often comes with traps in the back. Cryptocurrency news articles or influencer praises will make one feel that the crypto market is really simple and amazing. The reality is however always more difficult than what marketing departments want people to think. In addition to cryptocurrencies, there are many other types of investments such as gold, stocks, real estate, forest ownership, etc. Putting all these investment models on the scale for comparison can help to identify the best financial investment tool.

Each crisis or bubble will bring certain fluctuations to the market. Volatility is inevitable and does not necessarily lead to a complete loss of market value. Risks come with opportunities. When volatility occurs, there will be two cases: the risk of losing an investment or the possibility of increasing price. Deciding to participate in any market requires thorough research. No prediction will be completely accurate.

The last but essential thing when learning about cryptocurrencies and limiting the risks is the illegal activities associated with the use of cryptocurrencies. Criminals will mix and use cryptocurrency as a tool to carry out illegal activities such as drug sales, terrorist financing, money laundering, data theft, etc. Cryptocurrencies make this market quite fragile and vulnerable. The thing to do for each individual participating in the investment is to be calm and sober before flowery advertisements and to pay attention to the security of personal data. At the state level, laws on tax administration, crime prevention, and cyber security need to be carefully discussed to build the strictest legal framework.

Personal comments:

According to the research and experience of participating in the cryptocurrency market for several years, it is found that cryptocurrencies are fully capable of developing and receiving acceptance from many countries. However, the ability to replace fiat money is very difficult, even impossible, because currently, cryptocurrencies have not built up stability in value. Investing is not gambling, so following the crowd mentality is a failure. The cryptocurrency markets are too new to be compared to stocks - an investment type that has been present since 1661. Whether participating in any investment, acumen in thinking and patience will be the key to success. If one uses some spare money to invest in cryptocurrency and wait 5-10 years, it is not necessarily a bad decision. This is not financial advice, it is solely based on personal opinion.

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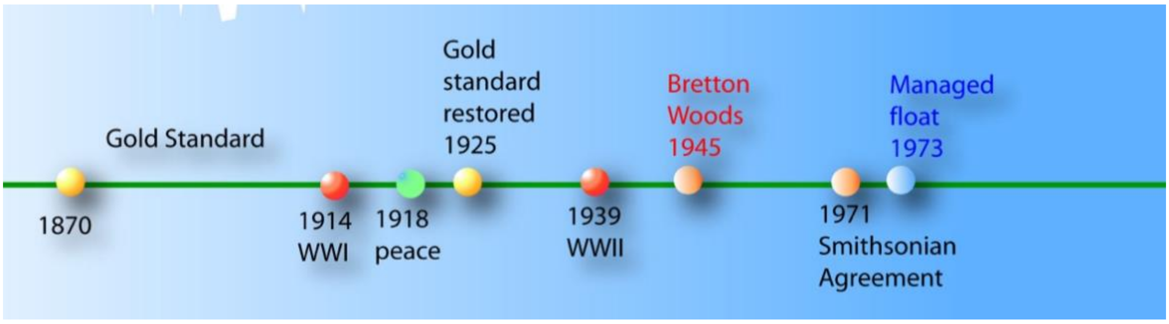
Appendix

Appendix1:EvolutionoftheInternationalMoneytarySystem



Appendix2:Top8currenciesinmarket07.05.2022(Coinbase2022).

Name	Price		Change	Market cap	Volume (24h)	Supply
Bitcoin BTC	€33,388.33		2.09%	€635.4B	€20.1B	19.0M
Ethereum ETH	€2,490.99		2.28%	€300.6B	€10.8B	120.7M
Ethereum 2 ETH2	€2,490.99		2.28%	€300.6B	€10.8B	120.7M
Tether USDT	€0.95		0.21%	€78.9B	€47.5B	83.2B
BNB BNB	€347.00		3.80%	€56.7B	€1.3B	163.3M
USD Coin USDC	€0.95			€46.0B	€3.0B	48.6B
XRP XRP	€0.55		2.33%	€26.8B	€1.1B	48.3B
Solana SOL	€75.08		3.20%	€25.2B	€953.8M	335.2M