FINAL THESIS

THE ADOPTION OF BITCOIN BY THIRD WORLD COUNTRIES: HOW TO BEAT DEPENDENCY THEORY?

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Abstract

This bachelor's thesis analyzes the relationship between First and Third World countries through the dependency theory and aims to show that the adoption of Bitcoin as legal tender is a solution to the underdevelopment of the Third World. As a matter of fact, the traditional financial system does not represent an option of help for these countries since it does not allow them access to basic banking services, such as savings, loans and more. In the present thesis, Bitcoin is presented as the solution that offers Third World countries an accessible, transparent financial option with the ultimate goal of reaching a degree of sustainable development for underdeveloped countries, through financial inclusion, deflation and, ultimately, reduction of corruption and promotion of transparency. To back up this theory, the concrete cases of El Salvador and the Central African Republic, as first two countries that adopted Bitcoin as legal tender in their jurisdiction will be presented.

Keywords

Bitcoin, cryptocurrencies, dependency theory, sustainable development, Third World countries

Resumen

Este Trabajo de Fin de Grado analiza la relación entre los países del Primer y Tercer Mundo a través de la teoría de la dependencia y pretende demostrar que la adopción de Bitcoin como moneda de curso legal es una solución al subdesarrollo del Tercer Mundo. De hecho, el sistema financiero tradicional no representa una opción de ayuda para estos países, ya que no les permite acceder a servicios bancarios básicos, como ahorros, préstamos, etc. En la presente tesis, Bitcoin se presenta como la solución que ofrece a los países del Tercer Mundo una opción financiera accesible y transparente con el fin último de alcanzar un grado de desarrollo sostenible para los países subdesarrollados, a través de la inclusión financiera, la deflación y, en definitiva, la reducción de la corrupción y el fomento de la transparencia. Para respaldar esta teoría, se presentarán los casos concretos de El Salvador y la República Centroafricana, como dos primeros países que adoptaron el Bitcoin como moneda de curso legal en su jurisdicción.

Palabras claves

Bitcoin, criptomonedas, teoría de la dependencia, desarrollo sostenible, países del Tercer Mundo

Abbreviations

BANDESAL	Banco de Desarrollo de El Salvador
BC	Before Christ
CAR	Central African Republic
CBDC	Central Bank Digital Currencies
CE	Current Era
dAPPS	Decentralized apps
Fiat	Let it be done
IMF	International Monetary Fund
PoW	Proof of Work
PoS	Proof of Stake
P2P	Peer to Peer
TWh	Terawatt hour
WB	World Bank
WTO	World Trade Organization
WWI	World War I
UEMOA	West African Economic and Monetary Union
UN	United Nations
USA	United States of America
USSD	Unstructured Supplementary Service Data

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1. Introduction

Globalization is a process that has been making its way into the international landscape approximately since the end of the Soviet Union, in 1991. The process assumes increasing interdependence among nations and more so among their economies, with the goal of creating a more peaceful world through economic cooperation and the promotion of prosperity. This has worked for First World countries, the rich countries, but has assumed negative consequences for peripheral countries, which suffer from an economic system, the capitalist system, that does not take into consideration their needs and capabilities.

The problem this final thesis seeks to address is that of the subordination of Third World countries to First World countries and the international organizations they support and finance. Rich countries exploit the raw materials and cheap labor of underdeveloped countries to create finished products at high prices that are unaffordable for poor countries. The result is that core countries get richer and richer to the detriment of peripheral countries, which are financially dependent, despite their wealth and availability of resources. In addition, international organizations, first and foremost the International Monetary Fund (IMF) and World Bank (WB), backed by the Western countries that created them, initiate development, and aid programs with the promise of development of underdeveloped countries. The poverty into which these countries pour, with increasing economic and social and political development problems, clearly shows that the direction of international financial organizations is failing.

Against this troubling backdrop, this final thesis seeks to propose a solution, which came to the fore at the time of its creation, in 2008. This solution coincides with the adoption of Bitcoin, the first successful cryptocurrency, by Third World countries. In fact, the purpose of this paper is to demonstrate that the solution for which underdeveloped countries would foster and boost their economic growth, achieving political stability and greater social security, is precisely independence from First World countries. Economic and financial independence in today's capitalist and capitalized world is essential. The major weakness of these countries coincides with their dependence on international financial organizations: with the promise of development aid, rich countries offer loans to underdeveloped countries, with high interest rates, which are impossible for these countries to pay. What the lenders of these loans want to achieve is a high degree of dependence of the peripheral countries on their economies, especially so that they can profit from the rich resources of their territories. This system acts as a barrier to the development and independence of peripheral countries. Moreover, the decision and acceptance of the functioning of this system was made by the rich countries, which represent a small part of the world's population.

Bitcoin presents itself as an option to the exploitation of the Third World, and what this paper wants to achieve is an in-depth analysis of why it can represent a solution. Bitcoin is an electronic payment system that is totally decentralized: this means that it is based on a distributed ledger, the blockchain, which allows control of the currency and the transactions made with it to be distributed equally to all users on the network. This implies that there is no need for a third party, an intermediary, to control the security of the transaction. In the traditional financial system, the controlling function is entrusted to an authority, be it a state or rather central banks. Bitcoin's structure is based on the conception of the distrust of the authorities and their control over the economy, so there is no need for a third party to get a grip on the currency.

This thesis will be structured as follows. The history of money, from barter up to Bitcoin, will be analyzed together with the concept of currency, and the context of the advent of cryptocurrencies. This analysis will serve to understand that since the earliest developments of human civilization, humans have found increasingly convenient ways to exchange value for one another. For this reason, it will be interesting to go through the history of money, and to understand what developments led humans to seek the next innovation of exchanging value, all the way to the digital currency, Bitcoin. Then, Bitcoin will be introduced, the structure that makes it unique will be thoroughly explained, in comparison to the second most popular cryptocurrency, Ethereum. The following point will concern the reaction of governments and international organizations in this regard, which resulted in the creation of cryptocurrencies by central banks.

Thereafter the topic of Third World exploitation and dependence on the First World will be addressed, and the presentation of Bitcoin as a solution to the relationship between the two worlds will be presented, along with the geopolitical and financial consequences peripheral countries would face with the adoption of cryptocurrency:

namely, the boost of financial inclusion, to solve the high percentage of unbanked people in underdeveloped countries, the ability of Bitcoin to be deflationary, and the reduction of corruption and promotion of transparency, especially at the financial and institutional level.

Following, the major criticisms of Bitcoin and the position of international organizations, IMF, and WB above all, will also be addressed. Finally, the case of El Salvador and CAR as early adopters of Bitcoin will be presented, as well as other countries that frequently use Bitcoin, despite not having adopted it as legal tender in their jurisdiction.

1.1 Sustainable Development Goals

As the purpose of this final dissertation is the sustainable development of underdeveloped countries through their adoption of Bitcoin, relevant are the Sustainable Development Goals, a set of achievements that in 2015 UN member states set out to achieve by 2030. Indeed, the major purpose of the SDGs is to leave no one behind. Relevant directly to this final thesis are several SDGs that will be reported and analyzed below. As explained in Section 4.1, poverty is now more than ever multidimensional and therefore includes several aspects. A study carried out by the Oxford Poverty and Human Development Initiative uses the multidimensional poverty index to measure multidimensional poverty in 100 underdeveloped countries.

- Sustainable Development Goal 1

To start with, SDG 1 implies No poverty. The main objective of this final thesis is precisely to investigate a possible solution for the improvement of conditions in underdeveloped countries, in every dimension. And that is why for the present writing SDG 1 is essential. Poverty is the main problem of developing countries, and those who are directly affected by it are precisely the people of these countries. Poverty denies basic rights to individuals, depriving them of a good education, access to safe food, clean water, energy and more. Getting off the poverty line for these people would mean being able to develop and have a better future for themselves and future generations. Poverty jeopardizes people's security in many ways, creating inequality and causing conflict. A strong and healthy economic and financial system allows people to work, save, invest, and foster their economic growth and development, improving the living condition of individuals.

- Sustainable Development Goal 2

Taking nutrition into consideration, for example, in these 100 countries any person under the age of 70 for whom nutritional information is available is malnourished, and the infant mortality rate, which considers young people under the age of 18, is very high. These issues are addressed by SDG 2, which aims to achieve 0 hunger by 2030, in addition to minor goals such as achieving food security and improving nutrition through sustainable agriculture worldwide. In fact, this goal aims for the survival and healthy development of people of every age in areas where their lives are at risk.

- Sustainable Development Goal 3

This leads to SDG 3 which wants to ensure good health and well-being for all and at all ages. UNICEF reports that even though this is the historical era when more children survive, more than 6 million young people under the age of 18 died in 2018 and from causes that could have been prevented (OPHI, 2018). The essential goal of this SDG is to ensure better health as well as treatment for diseases (UNICEF, 2023).

- Sustainable Development Goal 4

Multidimensional poverty also relates to lack of education, in fact a large part of the population has not completed 6 years of schooling and children are not currently attending school. This brings us to SDG 4 which implies equal access to quality education for all ages and sexes. Education is essential because it helps to build more resilient and peaceful societies, as well as to fight poverty (OPHI, 2018). In this precise case, educate people in fields such as technology and innovation are important, as the solution of adopting Bitcoin requires both financial and technological backgrounds. Fostering this type of education through the promotion of educational programs is key to succeed.

- Sustainable Development Goal 8

Broadly related to this final thesis is SDG 8 which reads "promote inclusive and sustainable economic growth, full and productive employment, and decent work for all" (United Nations, 2023). For if the biggest problem for developing countries is poverty, addressed by SDG 1, SDG 8 represents the solution here. Promoting economic and financial growth and sustainable development of these countries is essential, and the traditional financial system has proven for decades not to be able to do this. In this thesis, a new solution for developing countries has been analyzed, namely the adoption of Bitcoin. A better economic system can increase employment rates, decrease child labor and much more.

- Sustainable Development Goal 17

Finally, is SDG 17: "Strengthen the means of implementation and revitalize the global partnership for sustainable development" (United Nations, 2023). This goal remains utopian from a certain point of view: it is difficult to imagine that in the international arena countries would set goals on which everyone agrees and which everyone respects. To achieve most of the SDGs, however, international collaboration is necessary, or rather with external support it would be easier to achieve them. Despite this, this final thesis based its argument on dependency theory[1] and therefore believes that the best way for underdeveloped countries to grow economically and develop sustainably is to remove themselves from the exploitation of core countries and develop independently.

[1] See paragraph 4.1.

2. Methodology

The methodology used for the investigation and writing of this final thesis was in-depth research, reading, analysis and data collection of secondary information resources, to investigate the hypothesis of whether the adoption of Bitcoin by Third World Countries represents a solution to their underdevelopment.

The research was mainly based on the book "The Bitcoin Standard", published in 2018 by economist Saifedean Ammous, which provided me with a general but in-depth view of Bitcoin, the function it has and the function it could have. Essential was the support of resources such as online reports, scientific articles, databases, news magazines written by experts in geopolitics and international relations. I also made use of graphs mainly from the World Bank and the International Monetary Fund to collect data on multidimensional poverty in underdeveloped countries and the living conditions of those populations.

Laws and decrees were also used to explain the adoption of currencies in El Salvador, first in the process of dollarization and subsequently in the adoption of Bitcoin. The Twitter platform was used to show announcements made by El Salvador's President Bukele, necessary to back up arguments.

Following, the website of Investopedia has been of much use in the gathering of precise and technical information regarding Bitcoin and the technologies related to its functioning. In addition, the Oxford Dictionary and the Treccani Encyclopedia have been consulted for definitions that support and ease the comprehension of certain topics. Lastly, websites of the United Nations and the Oxford Poverty and Human Development Initiative were used to relate the SDGs to the issues addressed in the document.[2]

[2] All electronical sources were consulted the last time on 18/05/2023.

3. Currencies and Bitcoin

In this section, the concepts of currency and cryptocurrencies will be introduced, with a specific focus on Bitcoin. Then, the advent of Central Bank Digital Currencies (CBDC) and their geopolitical impact will be discussed.

3.1 The world of cryptocurrencies: Bitcoin and other digital tokens

In this sub-section, the evolutionary history of money will be analyzed, explaining the process that led from barter to Bitcoin, and the context of Bitcoin's invention. Finally, a comparison between Bitcoin and other cryptocurrencies will be made, and the role of speculation in the field of cryptocurrencies will be analyzed.

3.1.1 The history of money: from barter to Bitcoin

To understand how Bitcoin works and how this digital currency can operate as money, we will trace the history of money. Since the very beginning, mankind has looked for different ways to exchange value. In fact, money and the intrinsic concept of exchanging value arose from a willingness of human beings to cooperate with each other.

The first mode of value exchange coincides with barter, which is "the act of exchanging goods or services for things rather than for money" (Cambridge University Press, 2023). As the economy grew, so did the need to exchange goods physically. Human civilization began around 3500 B.C. feeling the need to record the exchange of goods so that they could be valued and quantified. It was precisely 5500 years ago in Mesopotamia that writing appeared for the first time, to record possessions and account for the transactions performed (Treccani, 2014). However, barter can only be successful in a small society: in a globalized and interconnected society like the one we live in today, barter could not be an efficient method of exchanging value, and it is in fact currently used only within family members and in private contexts. The main limitations of bartering are the following: there is no coincidence of value, meaning that what you produce does not have the same value as what you want; there is no coincidence in terms of time, so it can happen that what you want lasts longer than what you can offer; and finally, there is no coincidence in location, so what you want is not transportable or movable (Ammous, 2018, p. 1-10).

A second step in the history of money, is using precious metals, such as gold and silver in the form of ingots, as a medium of exchange: the value of the commodity to be bought was matched by a certain amount of precious metal, which had to be weighed. To guarantee the quality of the metal and its weight, marks were placed on the bars, which gradually eliminated the need for weighing. The intrinsic fact of the general acceptance of the weight and value of the marked pieces assumed the advent of coinage. This revolution takes place in the last decades of the 7th century B.C., and it proves to have enormous advantages, foremost the practicality of assigning a predetermined value, its fungibility[3] and durability (Treccani, 2023).

At this point, a fundamental concept makes its way into the history of money, a concept that stands at the basis of money as a medium of exchange: the concept of *trust*, which is destined to last to the present day. The birth of *trust* stems from the fact that, initially, the authority placed its seal on the coin to guarantee the weight and quality of the precious metal used to mint it. The seal also began to be placed on less valuable alloy coins, which led to the coin being used more as a fiduciary coin rather than for the intrinsic value of the metal it was made of. Nowadays, it works in the same way, in that money is issued by a central bank, whereby the value of the currency[4] is generally accepted, established by an organization that guarantees its value. With the concept of trust, that of *control* is also introduced. In fact, we have seen that the value of money is soon placed in the hands of a third entity that guarantees its value and that has been represented by various entities throughout history. Consequently, this third entity is a superior entity, which has a function of concretely controlling the currency (Bank of England, 2020).

The exercise of control is carried out through monetary policies that central banks use to manage economic fluctuations. Through monetary policies, banks want to achieve price stability and, thus, keep inflation low and stable setting, in the case of First World economies, inflation targets to be met and limits within which to stay. In addition, central banks regulate the money supply by buying or selling securities in the market (IMF, 2023).

[3] Easy to exchange or trade for something else of the same type and value (Cambridge University Press, 2023).
[4] The system of money that is used in a particular country, at a particular time (Cambridge University Press, 2023).

Coins began to have obvious flaws: the increase in trade, and thus in the number of people involved in this activity, made it difficult to transport large quantities of coins. For this reason, coins began to be deposited in guarded places, where protection was promised to other people's gold reserves and, contextually, a title was issued stipulating that a certain individual was in possession of a certain amount of gold. In China around the 10th century CE, the constant increase in trade and the invention of paper for various uses around eight centuries earlier, led to the invention of the banknote. This invention represented a major technological revolution, which found ground to take root in a context of economic and commercial growth: as a matter of fact, merchants were wary of transporting ingots and coins of precious metals, not to mention the huge amount of copper needed to produce enough coins for the ever-growing size of the economy of the time. It was easier for merchants to rely on paper receipts to make and receive payments, since banknotes are lighter, easier to transport and have more guarantee (Catwright, 2017).

In the Western world, the use of banknotes was established during the Renaissance (14th-15th centuries) and coincided with the invention of the first banks, for the safekeeping of gold coffers, in exchange for which the bank issued certificates of value to the bearer. In Europe, the economic revival experienced by countries was mainly due to trade. For this reason, it was of paramount importance to have bank offices located in different parts of Europe to avoid travelling with large amounts of gold. By issuing a quantity of gold in one bank, it was possible to withdraw the same quantity in the bank of another country by presenting one's securities. Later, people no longer physically exchanged gold, but began to exchange securities directly, giving birth to the circulation of banknotes. As they grew richer, the banks acquired enormous power, even managing to finance entire military campaigns for kings or emperors, thus centralizing so much power and wealth in one pole (Catwright, 2017).

In the 20th century, post-Industrial Revolution, banks became such powerful institutions that they could rival the most powerful states and propel the First World to exponential economic growth. However, after World War I (WWI) some countries took their currency off the gold standard and their decision to print more money to repay war debts caused inflation, and eventually marked the end of an economic era. The economic crisis in which the defeated countries were plunged after the war, prevented them from being able to repay the loans lent by the United States, which were forced to write off part of these debts. A semblance of normality returned in the 1920s, when the gold standard was re-established, but the economy still struggled to recover, and indeed expanded worldwide. In 1929, a huge crisis began, that went down in history as the Great Depression, and was also the first major economic crisis of the modern world. Many countries adopted the economic theories of John Maynard Keynes, a British economist who argued that during times of economic hardship, governments should intervene to lessen the impact of the crisis on the country's economy by creating jobs and increasing demand (IMF, 2023).

With the intention of not repeating the mistakes of the past, 44 states decided to boost economic cooperation, and meet in 1944 in Bretton Woods, New Hampshire. The major achievement of the Bretton Woods Agreement was the founding of the International Monetary Fund (IMF) and the World Bank (WB). In addition, the Gold Exchange Standard was established, stipulating that the financial system must give currency a mathematical correspondence with the gold in the gold reserves as a guarantee of its value. It is decided that gold must have a mathematical reference to the dollar, and so must all the currencies of the Bretton Woods Agreement states, making the dollar the reference point for all other currencies. In the 1960s, the dollar experienced a period of great inflation, which was exported to the other currencies dependent on it. In addition, the huge military expenditures of the Vietnam War led to an overvaluation of the dollar, which prompts US President Richard Nixon to announce the suspension of the gold-dollar exchange rate, in 1971. Since the collapse of the system, each state can decide independently on its currency, without it being associated with a gold reserve (IMF, 2023).

The West and, especially, the United States were experiencing a period of economic growth, and with it a technological revolution. Thanks to this impulse and the fact that the technological sphere was available to everyone, a trend of innovation began that led to the invention of the credit card in 1950. Founder Frank McNamara was in the habit of frequently dining out and leaving his wallet at home. In his regular restaurants, he would create a real credit, that he would repay later. Thus, he created the Diners Club card, whereby those in possession would charge the meal to the card and the restaurant would send the amount to Diners Club, which would make a money transfer to the restaurant, charging a commission for the transaction. The cardholder would consequently repay the total amount each month (Frankel, 2021).

The use of credit cards increased exponentially until reaching a veritable mass adoption in the 1980s, as it was a convenient, safe, and reliable method of exchanging value not only for credit card holders, but also for banks. Banks started financing private companies, the most common of which are Visa, MasterCard, American Express. All the world's money exchange happens through these three private companies, which control our transactions.

This period of flourishing innovations does not end here, for in the 1960s another magnificent technological innovation will change the way of life of mankind forever: the Internet. Initially invented for military purposes, in the 1980s the Internet came into civil use thanks to the advent of personal computers. Since then, the digitization process has expanded into more and more areas and to more and more people (Di Salvo, 2005).

3.1.2 *Cypherpunks* and the invention of Bitcoin

With the advent of this technology, a group of computer scientists predicted that the Internet would gain immense importance, and that battles for its control would soon begin. This group of computer scientists took the name *cypherpunk*[5] and their activities were driven by the belief in the future centrality of the internet to the world's population, and, consequently, the belief that governments around the world would soon want to exert control over it. With the desire to prevent this, and to make the Internet a free tool in the hands of individuals rather than states, these computer scientists used *cryptography*[6] (Qureshi, 2020).

Aware, however, that in the long run cryptography would not be enough, the *cypherpunks* knew that what would really set people free was a sovereign economy, namely digital money. Indeed, this group of computer scientists distrusted central

[5] “A group of people that use encryption when accessing a computer network in order to ensure privacy, especially from government authorities” (Oxford Languages, 2023). The origin of the term is *cyberpunk*, changed into *chyperpunk* in the 1990s.

[6] Technique of representing a message in such a form that the information it contains can only be received by the recipient; this can be achieved by two different methods: by concealing the very existence of the message or by subjecting the message text to transformations that render it incomprehensible (Treccani, 2014).

banks and their interventionism in the economy of states. On the strength of their suspicions and some confirmations provided by history, such as the 2008 crisis[7], the *cypherpunks* believed that a free and borderless space, such as the one represented by the Internet, needed its own form of money, based on the belief that a strong financial system was one that no one could manipulate (Qureshi, 2020).

Following several attempts to create a decentralized digital currency, a *cypherpunk* known as Satoshi Nakamoto announced in an encrypted e-mail on 1 November 2008 that he had produced "new electronic cash system that's fully peer-to-peer, with no trusted third party" and this digital cash is referred to as Bitcoin (Ammous, 2018, p. xv).

3.1.3 Bitcoin vs. other cryptocurrencies: why is Bitcoin so unique?

Before Bitcoin, there were essentially two methods of payment: cash payments and payments intermediated by third parties, which had already been mentioned before, such as credit/debit cards or newer systems like PayPal. Taking digital payments into consideration, the presence of a third party guaranteeing the security of transactions is given by the possibility of endlessly reproducing digital objects, and thus sending them would result in duplication. This problem is referred to as 'double spending', meaning that in the digital sphere there is no way to guarantee that a user will not use his funds for multiple payments, hence the need for a trusted intermediary.

However, with Bitcoin the problem of double spending is erased. An individual's possession of a certain number of Bitcoins is recorded on the blockchain and confirmed by cryptographic protocols available for control by any person. It is the users of the Bitcoin network who ensure that the verification processes are irreversible, removing the problem of double spending. This makes Bitcoin the first digital money allowing digital transactions to take place without the need for a third party (Ammous, 2018, p. 168-177). In other words, Bitcoin is the first successful cryptocurrency and below it will be explained why.

A cryptocurrency is a digital asset created on a blockchain technology distributed across a huge number of computers. This technology enables the existence of the

[7] To know more about the 2008 financial crisis, consult: https://www.investopedia.com/articles/economics/09/financial-crisis-review.asp

most important feature of cryptocurrency: decentralization, which allows the control of this currency to be distributed equally to its users, and thus out of the control of states and other authorities. The second most important feature is cryptography which, as explained earlier, removes the problem of double spending (Frankenfield, 2023).

Bitcoin is the most successful example of a cryptocurrency, a digital currency that serves the function of money and functions on blockchain technology, a database where all Bitcoin-related information is collected in blocks. Each time a block reaches its maximum information capacity, this block is closed and linked to the previous blocks. Thus, the blockchain is essentially a distributed ledger that is distributed among the nodes of a network, which are the electronic devices that contain copies of the blockchain (Hayes, 2022). Bitcoin's system of operation is called Peer to Peer (P2P), which is essentially a decentralized system that allows direct interaction between two individuals in a transaction, without the participation of a third party. In fact, it is precisely this technology that allows for decentralization, which is essential for Bitcoin to function (Hayes, 2021).

Figure 1. Bitcoin workings: the computers represent the nodes and the interactions between them stand for the Peer-to-Peer network, the decentralized system characteristic of Bitcoin. (Ayala, 2020)

Whenever a payment in Bitcoin is made, data is transferred from one node to the next, which is encrypted. All members of the network, called miners, can verify that the person sending the money has enough funds to make the transaction. Once the transaction is verified, through solving difficult mathematical problems, a new block is opened and the miner who managed to open it receives a reward in Bitcoin. This system is called Proof of Work (PoW) and all miners in the network can easily verify the veracity of the solution. The PoW is what makes Bitcoin so secure and what removes the need for an intermediary third party in transactions. For the same reason, Bitcoin's system can remove the need for trust, which is inherent in the transactions of other forms of money (Ammous, 2018, 168-177). An important concept regarding payments with cryptocurrencies is the crypto wallet, defined as a place where you “store your private keys, keeping your crypto safe and accessible, and that allow you to send, receive, and spend cryptocurrencies like Bitcoin and Ethereum” (Coinbase, 2023).

Bitcoin is the most popular cryptocurrency, and this is due to its operating system, which differentiates it from other cryptocurrencies. To understand these differences, it is useful to take the example of the second most used cryptocurrency, Ethereum. On the one hand, Bitcoin aims to have the same function as money, which is to possess value that allows it to serve as a medium of exchange, without government or private control. Invented seven years later, Ethereum realized that the blockchain could be used for other purposes, such as smart contracts[8] and decentralized applications[9]. Thus, Ethereum is not primarily used as a medium for decentralized transactions, but rather to exploit the innovative blockchain technology to facilitate other processes (Reiff, 2022).

As mentioned above, the verification system used by Bitcoin is the PoW. Ethereum initially used this same system, but later switched to the Proof of Stake (PoS), also based on blockchain technology. Unlike PoW, however, in the PoS those with the most coins are given the privilege of validating the next block. Thus, an algorithm decides who is most deserving of receiving the token, based on the stake they possess. In this way, the domination of the coins is in the hands of the richest, meaning those who own the most tokens. This takes away some of the decentralization inherent in cryptocurrencies (Frankenfield, 2022).

It is therefore clear that one of the substantial differences between Bitcoin and Ethereum is decentralization, which is total in the former and partial in the latter.

[8] “Self-executing program that automates the actions required in an agreement or contract” (Frankenfield, 2023).
[9] “Decentralized applications (dApps) are digital applications or programs that exist and run on a blockchain or peer-to-peer network of computers instead of a single computer” (Frankenfield, 2023).

Another important distinction between the two cryptocurrencies is certainly the scarcity of Bitcoin. According to the protocol of its inventor, Satoshi Nakamoto, the total Bitcoins that can be mined is 21 million. This introduced the previously non-existent concept of digital scarcity and absolute scarcity. Digital scarcity is a concept that indicates that a digital asset cannot be reproduced an infinite number of times, and Bitcoin is the first example of this concept. Absolute scarcity, on the other hand, refers to the number of Bitcoins, which is a finite number and therefore cannot be increased. Until now, the concept of scarcity was a relative one, referring to the amount that can be produced of that physical, tangible asset (Ammous, 2018, 168-177).

3.1.4 From alternative monetary projects to speculative excesses

Bitcoin, along with other cryptocurrencies, is a monetary project that has gained more and more ground in the years since its invention. However, the speculative aspect of its value must be considered.

Indeed, the value of Bitcoin is volatile and is linked to the supply-demand of the market, which, following the Covid-19 pandemic that started in 2020, is rich in speculative excesses. Consequently, the opinion of several economists is that this high volatility does not allow Bitcoin to serve as legal tender in developed first-world countries, as its reliability would be too low compared to current legal tender currencies. Nevertheless, if one takes into consideration the economies of underdeveloped or developing countries, it becomes clear that the distrust in governments, institutions and, thus, central banks can be solved by a cryptocurrency like Bitcoin (O`Neill, 2021).

3.2 The advent of Central Bank Digital Currencies and their geopolitical impact

Following the advent of private digital currencies, some states, first and foremost China and the United States, began to consider the creation of what are now known as CBDCs, or Central Bank Digital Currencies. This financial instrument has shown in its early days the power it can wield on the geopolitical mechanisms that are currently shaping the international arena.

The CBDCs can be defined as a new form of payment, in the form of digital currency, which aims to replace cash printing and is issued by a central bank. While CBDCs greatly simplify transactions, they demonstrate a major obstacle: the possession of users' private data in the hands of central banks, substantially increasing privacy risks for citizens in case of security breaches. In fact, the difficulties in adopting CBDCs certainly relate to problems such as those related to users' privacy and security. Indeed, moving in a digital, borderless space, users' private information is potentially at risk, whether they are individual, national, or corporate users (*Central Bank Digital Currency*, 2023).

The growing success of private cryptocurrencies, such as Bitcoin, have established in many world governments the consideration of the need for a national digital currency. However, some characteristics of cryptocurrencies need to be considered, such as their high price volatility, software and internet connection problems and security vulnerabilities. This has created fears among governments about the impact that instability can have on the market, and they have started to discuss ways to protect consumers (Sewall & Luo, 2022).

Given the enormous impact that the financial and economic system has on international relations between actors, a radical change such as the introduction of national digital currencies could change the current geopolitical landscape considerably. If we think of the international financial system we know today, we see how it has benefited the West enormously, especially the United States by enabling it to become a superpower. Moreover, for years the US dollar represented the preferred currency with which the gold standard was established[10] and to this day it is the preferred currency internationally (Sewall & Luo, 2022).

If the international financial system has so far largely benefited the United States, what would happen if the system changed? The adoption of CBDCs by some countries could allow them to expand beyond their borders and forge greater ties with other countries. This would happen because of the non-participation of third parties, as it would result unnecessary.

[10] See above paragraph 3.1.1

Historically, the most powerful states have also led major revolutions and have thus been able to be vanguard leaders and facilitate their own country or currency, as happened to the U.S. with the dollar. However, within the CBDCs technology, the innovator country is China, which has also expressed hope that this financial instrument will change the current geopolitical landscape. Indeed, the People's Bank of China has expressed its desire to change the global status of the dollar, which right now is managing financial balances and, thus, international economic policies. China's major goal is to promote its national digital currency and grab the position of strength given by its role as a pioneer in the industry. China wants to influence the rules of the game from above, favoring its partners and allies and disfavoring historical enemies (Sewall & Luo, 2022).

4. The International Relations between the First and the Third World

This paragraph purports to analyze the concept of globalization and the system that handles the international relations between the First World, together with the financial international organizations (IMF, WB, and WTO), and the Third World, through the lens of the dependency theory.

4.1 The concept of Globalization and the Dependency Theory

"*Globalization is the word used to describe the growing interdependence of the world's economies, cultures, and populations, brought about by cross-border trade in goods and services, technology, and flows of investment, people, and information.*"

(Kolb, 2022)

The development of relationships and economic and political cooperation between countries and people has always grown throughout history to facilitate trade and movement. The term *globalization* came more into use after the Cold War ended in 1991, to indicate the growing interdependence among states, which largely shapes current international relations. In fact, the main goal of globalization was the creation of a better world through economic cooperation, translated into a universal acceptance of certain rules whose compliance was subject to the control of multilateral institutions (IMF, WB, UN...), and, ultimately, the promotion of peace and prosperity. The most striking example is that of free trade, which helped avoid many economic conflicts, which could later have turned into large-scale conflicts. As a matter of fact, on the one hand, globalization has had consistent positive effects for First World countries: including, lower priced goods, large markets which benefited companies with larger customers, and spread of innovation (Kolb, 2022).

On the other hand, however, the same is not true for Third World countries. Although experts' opinions on globalization vary, many believe that the process serves the needs of the First World at the expense of Third World countries. The way the First World operates is through the exploitation of the Third World and its cheap resources, to enrich itself more. In this context it becomes true that the peripheral countries serve the needs and wants of the metropolitan countries, to which they are subservient.

The Journal of Third World studies in 2005 published a study entitled *Globalization and the Development of Underdevelopment of the Third World*, in which it was explained that globalization and internationalization are not synonymous: while the former indicates a desire to homogenize economic, social, and political spheres, the latter indicates cooperation between states to pursue common needs. This study argued that globalization would coincide with the promotion of a universal civilization, which would lead to countless conflicts. It is therefore necessary to distinguish between, on the one hand, the creation of a homogeneous civilization and, on the other hand, the promotion and support of diversity and multiculturalism (Irogbe, 2005).

Originating in the 1950s, dependency theory explains how this system works. According to this theory, the system that is fostering a widening gap between rich and poor countries is the responsibility of the formers, which for their economic interests and enrichment need to maintain a high degree of underdevelopment of the Third World. The functioning of the current system is characterized by the cheap prices of materials and labor in Third World countries, aspects that are exploited by rich countries, which have the capabilities and resources to transform raw materials into finished products. The finished products, however, are sold at high prices, unsustainable for the underdeveloped countries and thus increasing the gap between the two worlds (Munro, 2023).

Therefore, the dependency theory explains that the international relations that exist between the First and Third World are, in fact, relations of dominance and dependency. Basically, the economy of developed countries is dependent on the degree of development of the economy to which they are subject: the dominant country aims to expand and develop more, at the expense and detriment of the dependent country. This system provides for enrichment for the privileged countries and the existence of a peripheral class.

In studying these international relations between the two worlds, it should be taken into consideration that often the view being analyzed is the one of Western countries. It is enough to think of the fact that underdeveloped countries are often referred to as developing countries, assuming that this stage of underdevelopment is part of a greater process that ultimately results in development, as happened with the now-developed countries. This reasoning turns out to have a conceptual fallacy, however, in that it fails to consider that current underdeveloped countries, unlike the majority of First World, have experienced exploitation and slavery (Irogbe, 2005).

Underdeveloped and colonized countries in Africa, Asia and Latin America became exporters of raw materials in a market controlled by developed countries. In fact, governments of underdeveloped countries have no control over international markets for raw materials, which are instead often manipulated by powerful nations. This control is exercised not only in the economic sphere, but also in the political sphere. In the colonial era, if the colonizers had to surrender and leave the territory, they planned to put trusted and cooperative people in power so that they could influence the country from within, for example by affecting elections. To conclude, this system of domination and dependence is not due to a lack of capacities and qualities on the part of the South, on the contrary, the South has played an essential role in the shaping of international economy, but its development has been threatened, successfully, from within (Irogbe, 2005).

4.2 The international relations between financial international organizations (World Bank, IMF, and WTO) and underdeveloped countries

In 1944 the Bretton Woods Accords established the so-called Twin Sisters, namely the World Bank (WB) and the International Monetary Fund (IMF)[11]. Established after World War II, the WB was tasked with helping in the reconstruction of Europe after the

[11] See above paragraph 3.1.1

end of World War II through long-term loans. Later, this international organization began to do the same with underdeveloped countries.

It should be specified that both international organizations established by the Bretton Woods Accords were founded by developed countries and are supported by a voting system in which the largest lender is also the one who has the most weight in the vote. It can be said that the IMF and the WB are Western organizations, so much so that their presidents have always been American nationals or from a member state of the European Union (Blank, 2002).

The system of lending by the WB to underdeveloped countries works based on interest rates that are practically impossible for peripheral countries to pay, an aspect that will result in pouring them into greater economic difficulties, growing their debt to the organization and thus increasing the dependence of these countries. In fact, it often happens that, since they cannot afford to take out more loans, the underdeveloped countries must close their factories, causing the people who worked there to lose their jobs. The result is a steady widening of the gap between rich and poor, which keeps the latter quite below the poverty line (Irogbe, 2005).

The situation on the African continent is decidedly critical, not only because of large foreign debts: worsening the situation are other issues such as AIDS and other health diseases, as well as the lack of resources and armed conflicts. In addition, the major economic source of many of Africa's populations is based on agriculture and crops, and thus occurs in rural areas, where most of the population is concentrated. The remaining and smaller part of the population lives in the cities, but those who make enough money to be able to feed themselves and their families are very few.

Aware of the conditions of African populations, the IMF and the WB nevertheless decided to invest in the central areas of the city and leave most of the population, the farmers, and peasants, even more marginalized from the development plan. It thus becomes evident that the international organizations act according to the interests of their Western investors, rather than out of the genuine interest of helping the local people get out of their misery (Blank, 2002).

It is worth mentioning that this system is backed up by an economically driven set of policies called the Washington Consensus, which took hold in the 1980s. This system implies a decision made by Western States that the economic and development management of underdeveloped countries, especially in Latin America, should be in the hands of the WB and the IMF (Hurt, 2015). Many scholars believe that the truth behind the design of this policy was backed by a willingness of rich countries to use poor countries for their own benefit. The first argument in support of this view is surely the fact that the Twin Sisters largely failed in poverty reduction, and this is because, like any economic interest organization, it must prioritize the wishes of its investors, which can be ultimately summarized in the spread of capitalism (Irogbe, 2005).

In this context, a third international organization is to be analyzed, in its international relations with underdeveloped countries: the World Trade Organization (WTO), in theory designed to break down trade barriers. In its concrete operations though, it has always benefited and imposed the interests of Western countries, over the welfare of the underdeveloped, creating monopolies in Third World markets for the benefit of Europe and the USA. An interesting reasoning is provided in the already mentioned Journal of Third World Studies, which explains that the Third World countries cannot expect help and assistance from those superpowers that until the previous century colonized and enslaved them. Each nation, as reminded by realists, must focus on its own survival, so the welfare of underdeveloped countries is not developed countries' concern (Anderson, 2000). This is the reason why these international organizations, supported by Western countries, want the Third World to be largely dependent on them, especially in the field of exporting goods.

5. The adoption of Bitcoin as legal tender by Third World Countries

This paragraph aims at explaining the concept of multidimensional poverty, providing data that explain how people in the Global South are affected by it. Then, the solution of adopting Bitcoin as a legal tender currency in underdeveloped countries will be analyzed, before explaining the major financial and geopolitical consequences for those countries. Finally, the major critics to Bitcoin that have been gathered in the last years will be addressed.

5.1 The concept of multidimensional poverty

As of 2023, data report that more than 9% of the world's population lives on less than $2.15 a day, which amounts to 719 million people. 1.9 billion people, or 24% of the world's population, live in poverty, fragile contexts, and poor conditions, and most are in sub-Saharan Africa (Peer, 2023). Conditions of extreme poverty include financial hardship, lack of education, violence, and poor health conditions. The major causes of these conditions are discrimination and inequality, local religious and political conflicts, hunger, vulnerability, and violence of the weak, lack of sound governmental structures, access to employment and opportunities of different kinds (Cointelegraph, 2023).

Since the early 2000s, more emphasis has begun to be placed on the hardships of poor people, which had been neglected until this time. Initially, the index that was used to determine a person's poverty was only one: income. From about the 1970s, we see a shift from one-dimensional poverty to multidimensional poverty, which embraces other areas related to the poverty index. Therefore, the focus is not just on income, but rather on providing access for these people to have their basic needs met, including social inclusion and basic goods (UN Development Strategy and Policy Analysis Unit, 2015). The World Bank has developed a measure to determine multidimensional poverty, and that takes into consideration three aspects: monetary poverty, education, and basic infrastructure services (World Bank Group, 2022).

According to the World Bank, those living in severe poverty are those individuals who live on less than US$1.9 per person per day. The number of individuals in severe poverty has increased mainly because of the Covid-19 pandemic, but also because of the growing consequences of climate change, global conflicts, and inflation. Before the outbreak of the Covid-19 pandemic, the trend was oriented towards reducing poverty levels globally. Post pandemic, as the graph in Figure 2 shows, the trend has reversed and the amount of people in extreme poverty has increased compared to pre-pandemic, especially in developing countries (Bitcoinist, 2022).

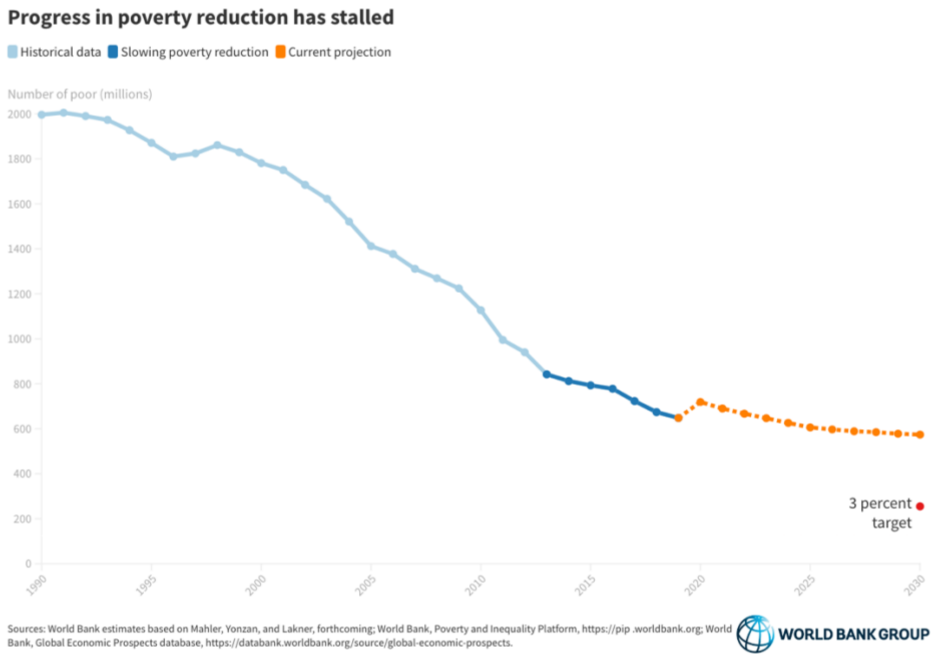

Figure 2. In the post-pandemic (2020), the number of individuals in extreme poverty increased compared to the pre-pandemic (2019) (Bitcoinist, 2022).

Due to Covid-19, underdeveloped countries suffered significantly worse financial difficulties than developed countries, such as the U.S. and Europe. In fact, rising unemployment, corruption, inflation, added to governmental instabilities in many of those countries, have led to a rise in poverty levels. In a condition in which retrieving economic well-being already seems to be nearly impossible, the Covid-19 pandemic worsened the situation, making it impossible for many individuals to sustain themselves financially (Bitcoinist, 2022).

5.2 The adoption of Bitcoin as legal tender by Third World Countries

The situation in the peripheral countries is an extremely critical one. Since colonialism, they have always been victims of exploitation by the metropolitan countries. From this it follows that in an inherently critical situation, every major crisis results in disastrous consequences for the Third World, as we have seen with the Covid-19 Pandemic. The main cause of these countries' "sensitivity" to change lies in their inherent great political and economic instability.

In this context, the adoption of Bitcoin as a legal tender digital currency in underdeveloped nations would have great benefits, first and foremost in reducing poverty and increasing the GDP of these nations, not to mention the greater stability that would result from the absence of inflation.

Some underdeveloped nations have high cryptocurrencies adoption rates, and this stems from the fact that the financial system is often extremely hostile to people in poverty, as it is impossible for them to take out a loan to start their own business, make an investment, and many people turn out to be unbanked. Cryptocurrencies can address some issues, which domestic currencies seem unable to do, such as unpredictable inflation, inefficient and expensive banking system, and the various restrictions given by financial regulations (Cointelegraph, 2023).

5.2.1 The economic and financial consequences

The world of cryptocurrency can be a huge help to the economic and financial instability of the Global South countries in three main fields: financial inclusion, inflation and, ultimately, reduction of corruption and promotion of transparency.

According to the World Bank, as of 2022, 1.4 billion people are unbanked (World Bank, 2022). A high percentage of unbanked people come from countries suffering from unstable, underdeveloped, and corrupt economies, and banking systems do not provide opportunities for low-income people, further worsening the gap between rich and poor. Financial inclusion turns out to be the first step to a greater degree of equality. Indeed, the adoption of Bitcoin as legal tender would serve to bring the unbanked to be banked. In underdeveloped countries, more than 50% of the population does not have access to banking institutions or basic financial services (World Bank, 2022).

To begin with, the adoption of Bitcoin by these individuals would allow them to be included in the financial system by giving them access to a fast system with reduced transaction costs. In fact, remittance costs with traditional currencies can charge up to 10% of the total money transferred. In Haiti, more than 25% of the country's GDP comes from remittance fees that workers abroad pay by sending money to their families in Haiti. Money transfers with cryptocurrencies can decrease transaction costs by up to 90%, these costs normally being between 2% and 5% of the total. This would give them access to financial services such as savings, loans, and more (Bitcoinist, 2022).

Second, for Fiat[12] currencies, devaluation is a big problem, along with rising prices. Bitcoin holds its value very well over time and is therefore a real asset against inflation. As a matter of fact, a second positive consequence lies in the fact that Bitcoin would successfully combat the inflation that plagues these countries, as in its nature it is deflationary. This is because since its creation, the limit number of Bitcoins that can be mined is 21 million. As it progresses on the blockchain, Bitcoin becomes more and more difficult to mine, which makes it more expensive. As the value of the currency increases, its purchasing power goes up with it, which makes Bitcoin deflationary and suitable for long term use (Bitcoinist, 2022).

Finally, it is to be aware that regimes in underdeveloped countries are profoundly corrupted, as leaders and politicians in high governmental positions often use tactics to maintain their power in an insecure, instable environment. The general discontent of the population in underdeveloped countries pours the regimes in a constant situation of crisis, where coercion is one of the few ways for leaders to maintain their influence. Therefore, through diversification, nepotism, infiltrates, and other tactics, leaders secure their power and ultimately increase the level of corruption and inequalities within the population. As Bitcoin exists on a decentralized technology, the blockchain[13], its control is distributed equally among all its users. This can serve as an incredible tool for reducing corruption, since every transaction is recorded and visible to all. It is therefore inevitable that blockchain technology allows Bitcoin to serve as an asset to digitize the finance of states, and ultimately achieve transparency (Krieg, 2019).

5.2.2 The geopolitical consequences

In section 4.1 we saw how the capitalist and globalized system that characterizes the current geopolitical arena basically serves the economic and financial interests of First World countries, at the expense of Third World countries. This system organizes relations between countries in such a way that the poorer country remains so, and thus constantly dependent on the rich one, while the rich country continues to get richer and maintains its status through the subservient status of the poor one. It often

[12] “Fiat” is a Latin term that means “it shall be” or “let it be done” and refers to the value of Fiat currencies, which is controlled by an authority. Examples of Fiat currencies are Euro and United States Dollar (Chen, 2023).
[13] See paragraph 3.1.3

happened that we referred to international organizations such as the World Bank, IMF and WTO as those organizations aimed at helping "developing" countries in their process toward economic, financial, social, and political development.

As analyzed in 4.2, however, the system promoted by these institutions and the countries of the West that they represent is an inherently bad system that does not help these countries; on the contrary, it pours them into more debts, with high interest rates which are increasingly difficult to pay. So, referring to Global South countries as developing countries should assume that their current state, is a temporary state. Instead, the present international system works on patterns that keep the countries of the Global South in a continuous state of underdevelopment. Indeed, it is difficult to think that those countries that have colonized and enslaved the Third World Countries, can be the ones to help them out of underdevelopment.

It is precisely for this reason that it is necessary for the countries of the Global South to find a long-term solution that removes them from this total and absolute dependence on the superpowers, who pass off their actions as help for people in distress and poverty, but instead want to keep them in this condition of dependence. Until 2020, for example, France has printed a colonial currency called the CFA Franc for the nations of the West African Economic and Monetary Union (UEMOA), composed of 8 nations: Benin, Burkina Faso, Central African Republic, Ivory Coast, Guinea Bissau, Mali, Niger, Senegal, and Togo. To them, France applies seigniorage and exploits their resources. For example, in Burkina Faso, one of the world's poorest nations, but rich in gold reserves, France prints colonial currency demanding in return that 50% of everything Burkina Faso exports end up in the coffers of the French treasury (De Georgio, 2020).

From this it appears that the problem of economic dependence above all, is what keeps the countries of the Global South, anchored in a system of total economic and financial exploitation and dependence. This is precisely what prevents economic development and growth in these countries. It is precisely in this context that a solution must be proposed to change their fate, and bring them to a level of development, or at least to the beginning of the process that ultimately leads to development, to be able to call them developing countries. To change their fates, it is necessary to change the financial system that currently governs all geopolitical and trade relations in the capitalist world in which we live. In 2008, came what could be considered as the solution to make the Global South independent and allow it to prosper. That solution is Bitcoin.

The countries of the Global South have been subjected, more so since the collapse of the Soviet Union, to the system of globalization and the wishes of the major international financial organizations, WB, IMF, and WTO, with promises to be helped by these countries to develop. This has not happened, and the promises have not been fulfilled. The role of Bitcoin stems from not postulating the need for an intermediary third party in the occurrence of transactions, since it is based on the blockchain which is the technology that allows the use of Bitcoin's operating system, the P2P system, in which all users have equal control and possession of the network of all other users and allows direct contact between them. Bitcoin is thus decentralized. The adoption of Bitcoin by the Global South would assume that these countries would no longer have to depend on an outside party monopolizing and making them dependent.

Another major obstacle to the development of these countries is also internal and concerns the high degree of corruption of governments and the political system in general. Part of the problem that does not allow the concrete implementation of development programs is the malfunctioning and weakness of institutions, which have no grip on the population. Corruption is more widely distributed in these poor countries, where injustices occur, and law enforcement is poor and unjust. Corruption is centralized in elites of a few people. This creates a great level of distrust and social heterogeneity that increases the degree of violence. All this has repercussions on people's living conditions, poverty, and education. The adoption of Bitcoin by individuals in these countries can help them untie from a corrupt and failing system through the pursuit of financial sovereignty. Banking institutions, as explained in section 5.2.1, are difficult for most people in these countries to access, which determines that the poor continue to remain poor, and the small wealthy elites remain so. Untying themselves from this centralized financial system can happen with Bitcoin and the financial inclusion of these individuals and the consequent reduction of economic discrimination and inequality can come true.

5.3 Shortcomings and critics of the adoption of the cryptocurrency as legal tender

Since cryptocurrencies began to take hold in the global financial landscape, private and public, there has been some criticism poured on this technology. This paragraph aims at analyzing the access to technology in the Global South, the energy consumption of Bitcoin, and ultimately the critics and positions of some actors of the international scene on the matter.

5.3.1 The access to technology in the Global South

One of the criticisms concerned the problem of underdeveloped countries' access to digital technology and the Internet. Indeed, in the debate over the adoption of Bitcoin as legal tender in Global South countries[14], those who are against it address the criticism that there is little access to the internet and electronic devices in underdeveloped countries. However, this turns out not to be entirely true. As reported by the United Nations' Africa Renewal program, the current one is the first generation to have direct access to technology. One example is the fact that in Namibia, some teenagers have started selling mushrooms on their mobile phones. In African society, the use of phones has become widespread, and people carry them everywhere. The WB reported that there are 650 million phone users in Africa, and from this it appears that there is currently more access to cell phones on the continent than to water, electricity or financial services (Sambira, 2013).

In the last decade in Africa, so-called feature phones, which are the older generation cell phones with buttons, and which accounted for more than half of the total amount of cell phones exported to the continent, have begun to take hold. This happens because smartphones are more expensive and difficult to use. For this very reason, a simplified Bitcoin protocol, adapted for the use of feature phones, is used in Africa. On this protocol, it is possible to run Machankura, the payment solution with Bitcoin fostering financial inclusion (Falodun, 2022). In fact, Machankura is a holder of Bitcoin in its most basic form, allowing people to make transactions, see their account details, and buy goods or services. In addition, this operates on Unstructured

[14] The Global South indicates those countries with low level of economic and industrial development, and that are usually geographically located at the South of industrialized nations (Oxford languages, 2023).

Supplementary Service Data (USSD), which is a simplified communication network used in Africa. This technology has enabled Machankura's expansion in Ghana, Kenya, Malawi, Nigeria, South Africa, and Uganda. Financial inclusion and banking the unbanked has become imperative today, which is why initiatives such as these, aimed at adapting advanced technologies to poorer contexts, are possible and are taking place now (Falodun, 2022).

5.3.2 Energy consumption of Bitcoin

A second major criticism aimed at Bitcoin is that of the carbon footprint of its operating system. Indeed, the presence of thousands of nodes, i.e., computers that mine bitcoin, produces very high energy consumption. Annual energy consumption in 2018 was found to total 46 TW/h, and it was explained that this figure exceeded the consumption of a country like Jordan (Stoll et al., 2019). This data, however, seems to lack a comparative figure. In fact, many critics of Bitcoin use this criticism to discredit the cryptocurrency in favor of the environment. On the same wavelength, it would be interesting to try to figure out what the energy consumption of the traditional monetary system is, using the same unit of measurement, the TW/h (Khazzaka, 2022).

Until 2022, it was lacking a study that traced and collected all the data on the carbon footprint of such an extensive system. In April 2022, however, a scientific study was published by a computer engineer specialized in payment security, Michel Khazzaka, which attempts precisely to study in the most extensive way possible the energy consumption of the traditional financial system to understand how much this impacts the environment.

The study explains that the monetary system has several components that contribute to energy consumption. Starting with cash, he explains that there are currently 842 billion banknotes and 1.507 billion coins in circulation. Each year, it is estimated that about 26% of the banknotes in circulation must be destroyed, replaced, and reissued due to wear and tear. This whole process requires an energy consumption of 17 TW/h per year. ATMs, which adding together data provided by commercial banks are estimated to have nearly 5 million installed and operating worldwide, consume an average of 47 TW/h per year. Turning to digital payments, in which transfers and credit card payments are included, Visa has only four data centers whose energy consumption data are secreted by the company itself. For security reasons these data centers do not communicate with each other via the Internet: they have a private intranet that is estimated to do 400 times the Earth's circumference. This has an energy consumption of 17.7 TW/h per year added together transfers and credit cards, consuming 11 W/h per transaction. There is about 207 million POS, and they consume 54 TW/h per year. In addition, there are 2.3 million IT servers and 46 million PCs connected to work for banks, which have a consumption of 33 TW/h per year. This study, the author pointed out, does not include the energy expenditure produced by employees serving the classic money system, such as bank employees working on payment systems, branches, and corporate offices of banks (Khazzaka, 2022).

Consequently, Bitcoin consumes 56 times less energy than the classical system, and a worst-case transaction of it is 1.2 times more energy efficient than a traditional wire transfer for example. In fact, it is unthinkable that as technology advances, it goes backwards instead in the issue of the environment. On the contrary, normally newer technologies aim to have a smaller carbon footprint than earlier ones, and this can be said to be the case with Bitcoin (Khazzaka, 2022)[15].

5.3.3 Position of the International scene on the matter

Other criticisms have come from international organizations, led mainly by IMF and WB, which argue that the role of cryptocurrencies as legal tender in countries with high inflation and instability cannot represent an asset, due to the volatility and fluctuations in its value, given the lack of an intermediary to ensure its stability. For this reason, the Twin Sisters argue, cryptocurrencies cannot be a solution for financial inclusion (Gorjón, 2021).

Clearly now it is undeniable that Bitcoin is volatile and characterized by high fluctuation. Even in this case, however, there is a need to consider options. Fiat assets are more stable, due to the presence of a banking entity that ensures their value. So, Fiat money continues to decline in value, but it does so in a stable way, thus it is not characterized by day-to-day volatility. However, this means it can lose 40% of its value slowly and over 2, 5 or 10 years. So, as pointed out by the author of *The Bitcoin*

[15] For more information visit: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4125499

Standard and economist Saifedean Ammous, the options are “relatively short-term stability with long-term decline, or short-term volatility with long-term rise” (Ammous, 2022). Bitcoin is currently a new technology and accounts for 1% of the global money market, or less than 1 trillion U.S. dollars. For this reason, we see its value rise and fall so abruptly; as this cryptocurrency grows, so does its salability, and the likelihood of an individual buying with Bitcoin influencing the price so violently, consequently decreases. Therefore, in the long run, as the market size increases, you are likely to see Bitcoin's volatility diminish more and more (Ammous, 2022).

In 2021, the People's Republic of China banned transactions with cryptocurrencies, explaining that the goal was to prevent financial crime and economic instability. An in-depth analysis by the Word Economic Forum, however, reported that China's ban stems from a fear of the country losing control over the national economy, as with cryptocurrencies it would be possible to overlook government-imposed restrictions. This policy, the World Economic Forum explained, is part of a larger plan aimed at greater state interventionism in the economy, a campaign China calls the “Common Prosperity Campaign”. In fact, one of the reasons for the crypto ban was the increase in foreign investment: by banning digital currencies the nation achieved greater citizen contribution in domestic wealth (World Economic Forum, 2022).

6. Case Study: El Salvador and Central African Republic’s adoption of Bitcoin as legal tender

In this paragraph two case studies of countries that adopted Bitcoin as legal tender will be analyzed: El Salvador and the Central African Republic. At last, the cases of countries that rely on Bitcoin, without adopting it as legal tender, will be also presented.

6.1 El Salvador

El Salvador was the first State in the world to employ Bitcoin as legal tender in its jurisdiction. On June 9, 2021, the country's Legislative Assembly adopted by a strengthened majority a law known as *Ley Bitcoin*. The Bitcoin Law kicked off a process of transitions that culminated on September 7, 2021, registered as the official date on which the country converted to Bitcoin. This initiative was taken by Nayib Bukele, El Salvador's president since 2019, and announced during the Bitcoin Conference in 2021. The President envisioned several economic and financial benefits for national businesses and the local population, referring mainly to the low remittance costs, the ability to achieve high financial inclusion, and the significant savings that would mean break away from the country's dependence on the dollar[16] (Gorjón, 2021).

In fact, the bill defines precisely that the adoption of cryptocurrency aims to achieve two main goals. The first is to greatly reduce banking transaction costs, which are very high with the dollar. This mainly affects expatriates working in the economy of another country, where they are residents. For these individuals, bank transfers to families located in El Salvador, have substantial problems: they are slow, have high fees and limited access, often given by the inefficiency of the local banking system. Suffice it to say that the Federal Reserve recorded that in 2021, the average cost of sending a transaction from the United States to other countries was more than 5% of the total value of the transaction (Betancur, 2022).

Second, the initiative aims to increase and foster the financial inclusion of the population, which only comprises 30% of the Salvadoran population, but which President Bukele promises will reach at least 70% (Castro, 2022). El Salvador underwent a dollarization process in the late 2000s[17], which assumes the country's import and export of printed dollars to circulate in the economy; this process costs El Salvador about USD 1.5 million per year. In addition, the banknotes last in circulation no longer than six months, which supposes an exchange and the need for the Federal Reserve's deferral of physical dollars to sustain them with the old ones (Betancur, 2022).

Worth mentioning, are other essential points of the Bitcoin Law:

a) Bitcoin can be used for any transaction including the payment of taxes and all economic agents must accept it as a form of payment.
b) The exchange rate between Bitcoin and the dollar is established by the market.

[16] See above paragraph 5.2.1

[17] On November 30, 2000, the Legislative Assembly of El Salvador approved Decree 201, which gave life to the Law of Monetary Integration, which implies the country's switch from the Salvadoran colon to the US dollar. For more information on the Law of Monetary integration consult: https://ssf.gob.sv/wp-content/uploads//ssf2018/Otras%20Leyes/Ley_integracion_monetaria.pdf

c) Exchanges in Bitcoin will not be subject to capital gains taxes, just like any other legal tender.
d) Excluded from the law are those who do not have access to the technologies that allow Bitcoin transactions and the State takes the responsibility to promote the necessary mechanisms.

In addition, the law presupposes the creation of a trust fund in the Banco de Desarrollo de El Salvador (BANDESAL) to which USD 150 million has been earmarked to ensure automatic conversion from US dollars to Bitcoin and to stimulate its use in the population by financing public projects. In addition, using the funds allocated to BANDESAL, the government of El Salvador has put into circulation an official state wallet, the Chivo Wallet, which makes it possible to send and receive payments, and to convert Bitcoin into dollars and vice versa, without commission. This platform is only intended for Salvadorans, who must enter their national ID or passport of El Salvador to register. Once registered, the user can make a reload through a Chivo counter in El Salvador or the United States and deposit cash or make an operation on the webpage with a credit card. Instead, to withdraw money, it is possible to make a transfer to local banking entities or withdraw from a Chivo counter. Finally, to make a payment, you are asked for a telephone number or personal identification number on the Chivo Wallet platform, or scanning a QR, and the amount. In this way, transactions are not anonymous, because the data required for payment can be traced back to the user. Similar works for companies, which can charge customers and pay taxes (Betancur, 2022)[18].

In the early days, the adoption of Bitcoin was turbulent for El Salvador. In fact, following the adoption of the Bitcoin Law, the government bought $21 million worth of Bitcoin, corresponding to about 400 Bitcoins, most of it destined to finance BANDESAL. As a result, the value of Bitcoin plummeted, causing a loss of almost 4 million dollars. In addition, there were technical problems in downloading the official digital wallet, which was not available in the App Store or Google Play, but these problems were solved a few days later and now it seems to be working optimally (Betancur, 2022).

[18] To know more about the Bitcoin Law consult https://www.jurisprudencia.gob.sv/DocumentosBoveda/D/2/2020-2029/2021/06/E75F3.PDF

This transition from a traditional currency to a digital currency is an extreme change for the economy of a sovereign country and did not hide initial difficulties of a system that does not support cryptocurrencies. El Salvador, led by its President, has decided to be at the forefront of the use of the resource that Bitcoin represents, given the difficulties that the country's dependence on the US dollar since 2001 has presupposed for the Salvadoran population. Adaptation to a new financial system must be considered, with all that may ensue, whether positive or negative. It should be mentioned that the country's Bitcoin policies have enticed many investors to visit the country, boosting El Salvador's tourism, and investments in its economy.

Moreover, almost two years after its adoption, Bitcoin has shown that it can benefit El Salvador, which seems to be slowly adapting to the change. In fact, the country's Treasury Minister, Alejandro Zelaya announced that the government of El Salvador has been able to repay $800 million bonds, which shows that the process undertaken is leading, between ups and downs, to financial stability and a decrease in the country's public debt. In a Twitter post published in January 24 of this year, President Bukele underlined that American medias do cover the poverty of El Salvador and the bold choice of adopting Bitcoin, but do not cover the step forward his country is doing, which leaves to think.

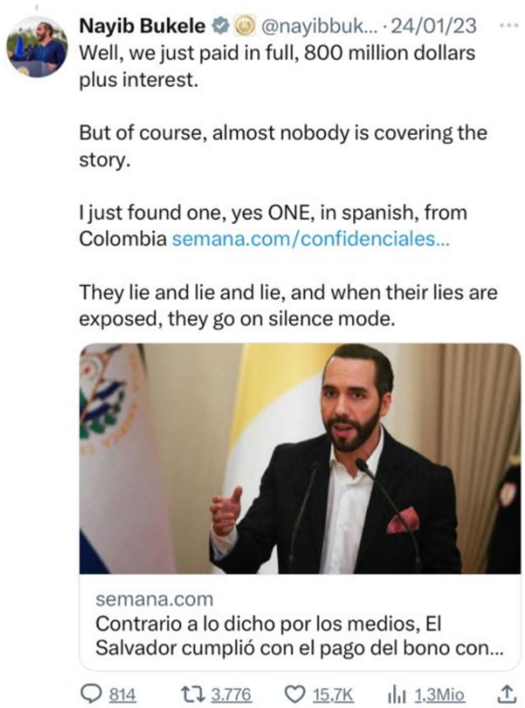

Figure 3. President Bukele's Twitter Post of January 24, 2023, explaining El Salvador paid in full 800 million dollars debt.

6.2 Central African Republic

In April 2022, the Central African Republic became the first African country to adopt Bitcoin as legal tender and the second state in the world, after El Salvador. The situation for CAR, however, turns out to have different aspects than those of the pioneer: namely, CAR is a country that is very rich in natural resources, but it is poorly managed economically and institutionally, elements that make it fall below the threshold of the World Bank's Human Development Index, as well as categorize it as one of the poorest countries in the world (Hall, 2023). In addition, as explained in section 5.2.2, 85% of the country's resources and exports go into the coffers of the French government (De Georgio, 2020).

In this context, Bitcoin would have the potential to prompt changes for the better, chief among them the country's emancipation from Western exploitation. In fact, one of the biggest problems for CAR certainly lies in the major amount of external debt, which makes it impossible for the country to resort to classical financial aids. To this, the country has reportedly found a solution, which consists in the creation of SANGO coin, a governmental project that aims to attract foreign investors by granting them citizenship and access to resources with the use of this payment method (Hall, 2023). The accumulation of funds from the use of this methodology, would then be used to buy Bitcoin and invest in the education and resources needed to successfully make Bitcoin legal tender, as well as in other fields such as security, water, education among the main ones (Hall, 2023).

June 2, 2022, the Bitcoin delegation issued a report to the president of the Economic and Social Council of the Central African Republic, in which information for the implementation of Bitcoin was gathered. Primarily, a table of CAR's strengths and weaknesses was made: the first includes favorable regulations for the adoption of Bitcoin, use of mobile phones and the possibility of increasing the current 5% figure of unbanked people in the country. Among the weak points we consider access to electricity and therefore to the Internet: there is currently an economic gap in the country between those who live in the cities and therefore have an adequate energy network, and those who live in the villages, which are completely isolated. The process of financial inclusion would presuppose uniform access to electricity to equalize the economic differences between cities and villages (Gouspillou et al., 2022).

With regard to the Internet, the advances are important: currently in the Central African Republic there are 2 million subscribers to a tariff plan and therefore in possession of a mobile phone, and in the capital Bangui there is 100% 3G coverage; in addition, the African Development Bank is financing a project that would allow fiber optics to be installed with the goal of covering 70% of the territory and thus including almost 90% of the population (Gouspillou et al., 2022). The importance of this project lies in the fact that a lack of internet often results in a lack of information. On the same level, users of telephones are scarce, as a large part of the population of the Central African Republic does not have an ID, which is necessary to buy a SIM card. A further problem is that of the absence of education programs and the current lack of funds to be able to proceed with these (Gouspillou et al., 2022).

6.3 Countries relying on Bitcoin

There are other countries using Bitcoin on a daily basis, although they have not adopted it as legal tender. In fact, recent studies have shown that the market for cryptocurrencies is dominated by emerging markets. In particular, low-income countries are among the 20 countries that most use digital currencies, and among these we recognize countries such as Vietnam, India, Nigeria, Indonesia and others.

The most striking example is Vietnam, which already in 2021, and reconfirmed in the following year, ranks first in the use of cryptocurrencies, first among them Bitcoin that registered an investment rate of more than 30%. This is because the country has high purchasing power through cryptocurrencies and more than 1/5 of the Vietnamese population uses or owns cryptocurrencies, with an ever-increasing rate (Chainalaysis Team, 2022). Another country that makes great use of cryptocurrencies, ranking 4 in in crypto adoption is India. Continuing at this pace, the country would surpass high income countries such as the United States in the use of crypto, registering by the end of 2023 more than 150 million members and 11% of the total population, percentage composed of individuals between the ages of 18 and 40 (Dzhondzhorov, 2023).

A third example is reported from the case of Nigeria. The country is experiencing a financial crisis with an inflation rate of 21%, and the unbanked find themselves under greater difficulty and pressure. In this context, the use of Bitcoin is seen as a resource of hope, and a haven that is becoming increasingly popular among African countries. This is because it does not generate geographic or class exclusions, is decentralized and secure, and can benefit everyone. It is an anti-inflationary tool that allows individuals to get their money back and preserve their wealth and obviously increase financial inclusion without the need for a leader or organization in power. The need for financial options other than those repurposed so far puts the African continent at the forefront of this financial experiment with Bitcoin as the protagonist, and as a concrete solution to the disastrous economic situation in which African countries are plunging (Khalil, 2023).

7. Considerations

Based on the arguments that have been covered throughout the whole analysis, we consider the following aspects to be of relevance to draw some conclusions.

A first consideration comes from the concept of innovation; for this, we find important to remember that the idea of a cryptocurrency independent of any control was born with the advent of the Internet in the 1980s and with this, the fear that this powerful tool would be controlled, and its access restricted by authorities. Modern nation-states have gradually become more and more economically and financially restrictive and have assumed the exercise of authoritarian and repressive tendencies over weaker and poorer countries. However, we think that the role of technology, and of the innovation it brings aims to improve, speed up and simplify certain processes.

As is the case with the advent of other technologies, during the research it became evident that there is no shortage of skepticism and concerns with the advent of Bitcoin, especially since it involves a very sensitive area that affects people's lives daily: money. What we want to convey with this analysis, to fully understand the technology behind Bitcoin, is that it is a wake-up call, a digital revolution aimed at the oppressors, at those who exploit for material and economic gain, jeopardizing the security and wellbeing of entire countries and the individuals within them. Here, we set ourselves the goal of showing Bitcoin as a chance to give individuals back control of their lives, handing them control of their money and their lives, and giving them the ability to save, invest, open a business, and more.

In our view, the capitalist system that governs societies and the current relationships between countries, subjects, and institutions, provides for a subordination of poor subjects to financial and governmental institutions, both nationally and transnationally. In developing countries, there are many individuals who are excluded from the financial and economic field of their countries; these people are referred to as unbanked in the present financial system, which we believe does not give them the possibility of opening a bank account, putting money away, taking out a loan to open a business. This is backed up by data: currently, the number of unbanked adults in the world is 1.4 billion[19] (World Bank, 2022). This means that for these people there seems to be no solution because they cannot participate or contribute to their country's economy and, eventually, end up in ever greater poverty. The consideration that we want to support is that the underdeveloped countries have found themselves part of a capitalist system in which decisions are made by the wealthy countries, decisions that result in the exclusion and subordination of the peripheral countries. And our view is that this situation stems from the system that allowed central banks to become more and more powerful and consequently to make individuals more and more subservient, system that was solidified at the end of WWII (IMF, 2023).

In our opinion, Bitcoin aims to correct this system of 'imbalance of power' through a different, more inclusive, open, and fair financial system. It is an asset whose functioning and characteristics of decentralization, independence from an authority, and security in transactions are defended by cryptography, which makes Bitcoin secure, accessible to everyone, and transparent. In other words, cryptography ensures that the line of communication between parties is safe and not compromised by the presence of a third party. We see it as a tool that allows the Third World to be freed from the coercion to which they have been subjected, and return to owning their own territories, their own resources, their own institutions, and be free from inflation. Bitcoin's scheme makes it possible to break away from banks, financial institutions, and governments, which currently hold any market, of any good or service, and replace this with a scheme where anyone with an internet connection and a phone, even a basic one, can access free, fair, and equal markets for all (Ammous, 2018).

With the invention of Bitcoin, Satoshi Nakamoto has devised a totally independent system that can change the mechanisms that dominate international relations and be free of an intermediary, but above all he has devised a system that can exist and function completely separately from the traditional financial system (Ammous, 2018).

Despite the uncertainty arising from this new technology, closely analyzing the geopolitical consequences, the conclusion that we drew in this final thesis is that it would be positive for Third World countries to adopt Bitcoin. We see the fact that Bitcoin would help underdeveloped countries get out of the financial system in place

[19] See paragraph 5.2.1

at the moment as positive, because this system does not work for them, and the data confirms this: in many underdeveloped countries, 50% of the population does not have access to basic banking services and almost 2 million people worldwide live in poverty, most of which are in underdeveloped countries, which are the same countries that are extremely indebted to Western international organizations (Peer, 2023).

Our second consideration stems from the Western view, in which underdeveloped countries are portrayed as countries that have failed to adapt to the changes of their times. Instead, we consider and recognize that Third World countries play a large role in shaping world markets, contributing to the export of natural resources in their territories. In addition, in our opinion, referring to these countries as developing countries is incorrect. In fact, this would imply that this moment of their industrial and financial underdevelopment is momentary and part of a larger process that would culminate in their development. Instead, it turns out that substantial improvements in this direction have not been made. Although the number of people on the extreme poverty line has decreased, those in extremely precarious conditions still number in the millions (World Bank, 2022).

To conclude, the point that we have been made throughout this study is that the situation in which developing countries find themselves is serious and we firmly believe that the traditional financial system does not offer solutions that can have a great impact. Our last consideration as a matter of fact, is that at the moment, Bitcoin could accomplish what the Fiat currencies are unable to do: lift the Global South out of their poverty and begin their process of industrial and economic development, and independence from the First World. If the SDG 1, No Poverty, represents the problem we believe SDG 8 represents the solution, which focuses on economic growth. Finally, we find the will of these nations to grow and develop is evident in their participation in the cryptocurrencies markets, which seem to represent a concrete and increasingly viable solution to their difficulties (Chainalaysis Team, 2022).

8. Conclusions

Bitcoin is the first successful form of digital money, aiming at giving at those who use it sovereignty over their money as well as economic freedom. Before its invention in 2008, this was only possible to a limited extent. As a matter of fact, Bitcoin is a cryptocurrency that bases its existence on the combination of three technologies: the blockchain, P2P technology and cryptography.

These technologies allow four major characteristics of Bitcoin, which are decentralization, accessibility, transparency, and the fact of not being a physical asset, in other words it is not physically present anywhere. From this, it follows that it cannot be tampered with, destroyed, or confiscated by any authority. Furthermore, blockchain allows for the decentralization inherent in this technology, which removes the need for a third party, intermediary or controller in Bitcoin's economic processes and functions. Also, since the number of Bitcoin possible mining is 21 million, the cryptocurrency is deflationary.

All these features make Bitcoin suitable to adoption as legal tender currency in Third World Countries. This bachelor’s thesis set out to prove that Bitcoin’s adoption would benefit peripheral countries, fostering financial inclusion of the unbanked, counter corruption, boost their economic development, fight multidimensional poverty, and ultimately get them independent from the First World and their mechanisms of control.

In conclusion, the case of El Salvador was presented as first nation that passed Ley Bitcoin in 2021, where the President Bukele argued that certain economic and financial benefits would result from the adoption of Bitcoin and the consequent separation from dependence on the US dollar. El Salvador has been followed by CAR and other countries that even though did not adopt Bitcoin as legal tender, are relying on it.

Related to this, the thesis has demonstrated cryptocurrencies market is dominated by emerging markets, low-income economies and this shows that underdeveloped countries want to find a solution to their high inflation and economic difficulties, and this solution could concretely be Bitcoin.

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