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BITCOIN AS A PUBLIC POLICY TOOL FOR FINANCIAL DEVELOPMENT: A CASE FROM EL SALVADOR¹

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ABSTRACT

In our rapidly globalizing and digitalizing world, data transfer can be done quickly in multimedia, communication, computer systems, etc. On the other hand, a blockchain database is a technology that allows us to transfer assets such as digital money that we attribute value to. This technology, which eliminates centralization and distributes reliability and transparency among all users, is also known as the technology under virtual currencies such as Bitcoin and Ethereum. El-Salvador is the first country to accept Bitcoin as a legal currency. It is one of the most fundamental issues to wonder how this will affect the economy of El-Salvador and the spread of financial services to all members of society. In this study, it is examined how the process of accepting Bitcoin as legal money has an effect on the economy of El-Salvador and the percentage of people's access to financial services. Although there is not a great background to make an empirical assessment on the subject, it seems that a large part of the society has started to use Bitcoin through the official mobile application of the state. It is seen that even citizens who did not have a bank account before can access financial services with this method. In addition, the rapid increase in the investments coming to the country due to the tax advantages provides a great added value for the country's economy.

Key Words: Blockchain, Bitcoin, El-Salvador, Financial Inclusion

Jel Codes: B26, F63, G23

FİNANSAL GELİŞME İÇİN BİR KAMU POLİTİKASI OLARAK BİTCOİN: EL SALVADOR ÖRNEĞİ ÖZ

Hızla küreselleşen ve dijitalleşen dünyamızda, multimedia, haberleşme, bilgisayar sistemleri vb. birçok alanda veri transferi kolaylıkla yapılabilmektedir. Blokzincir veri tabanı ise, bu verilerin haricinde değer atfettiğimiz dijital para gibi varlıkları da transfer etmemizi sağlayan bir teknolojidir. Merkezizetçiliği ortadan kaldıran, güvenilirliği ve şeffaflığı tüm kullanıcılar arasında dağıtan bu teknoloji, Bitcoin ve Ethereum gibi sanal paraların altındaki teknoloji olarak da bilinmektedir. Bitcoin'i yasal para birimi olarak kabul eden ilk ülke El-Salvador olmuştur. Bu durumun El-Salvador ekonomisinde ve finansal hizmetlerin toplumun tüm üyelerine yayılması konusunda nasıl bir etki göstereceği merak edilen en temel hususlardan birisidir. Bu çalışmada Bitcoin'i yasal para olarak kabul etme sürecinin El-Salvador ekonomisinde ve halkın finansal hizmetlere olan erişim yüzdesinde nasıl bir etki oluşturduğu incelenmiştir. Her ne kadar konu ile ilgili ampirik bir değerlendirme yapmak için büyük bir geçmişi olmasa da, toplumun büyük kesiminin devletin resmi mobil uygulamasıyla Bitcoin kullanmaya başladığı görülmektedir. Daha önce herhangi bir banka hesabı dahi olmayan vatandaşların dahi bu yöntemle finansal hizmetlere erişim sağlayabildiği görülmektedir. Ayrıca, sağladığı vergisel avantajlar sebebiyle ülkeye gelen yatırımların da hızla artması ülke ekonomisi için büyük bir katma değer olmuştur.

Anahtar Kelimeler: Blockchain, Bitcoin, El-Salvador, Finansal İçerme

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INTRODUCTION

In our developing, changing, and globalizing world, innovative technologies continue to change our lives. With the innovative technologies offered by Industry 4.0, production, transportation, and internet technologies have increased and in parallel, the trade volume between countries has expanded rapidly. With this last link of the industrial revolution, which is based on the development of production capabilities with smart internet-based technologies and their integration with other systems, the world has entered a new era.

Today, thanks to the rapid development of the internet, the ability to transfer data between two different people in two different parts of the world have become a very normal and costless process. In an article on Bitcoin published in 2008, the subject was taken a step further and "valuable asset" transfer was brought to the agenda besides data transfer (Tubitak, 2021). With the new Block Chain Technology, a new dimension has been brought to the transfer of valuable assets. With this technology, the concept of central authority (bank, state, etc.) has been disabled. In this system, which allows the transfer of all kinds of valuable assets without being dependent on any authority, the security of the data is now provided with a special encryption system (Rauer, 2020). With this feature, data privacy is at the highest level in block chain technology. On the other hand, with the elimination of the need for third parties in block chain technology, all participants can see and follow the contract details and conditions with the help of smart contracts. One of the most distinctive and original features of the system is that it consists of a transparent and distributed structure. All transactions performed in the system are recorded in a public account book. The records are transparent, cannot be deleted, or changed, and can be easily followed by anyone at any time (Kırbaş, 2018).

Since the trust mechanism does not depend on individuals or institutions, but on the distributed nodes and the difficulty of the mathematical operations they contain, it technically creates a high-level trust environment (Tubitak, 2021).

On the other hand, countries' investments continue with increasing in block chain technology which can be used in areas such as financial sector applications (payment transactions, fintech, money transfers, etc.), public sector applications (digital identity, social security system, tax system, etc.), supply chain, energy sector and smart contracts. (Cognizant, 2016). The use of block chain technology can be of great benefit in cases where the cost of establishing a distributed and reliable center is high, especially in application areas where it is difficult to provide audit and security from a single source (Kırbaş, 2018).

In addition, according to Balta (2021), there are many different features between block chain technology and the old central database system. According to the research; while record integrity is high in the block chain system, it is moderate in the central database system. When evaluated in terms of usability, while there is a high availability rate in the block chain system, it is at a low level in the central

database. On the other hand, while there is a high level of fault tolerance in the block chain system, the fault tolerance in the central database is at a low level.

Although it can be used in many areas, block chain technology has become famous with Bitcoin, that is, crypto money. Today, interest in cryptocurrencies, especially Bitcoin, continues to increase.

Since this technology tends to increase the usage of financial services, it can be evaluated as a trigger factor that accelerate financial inclusion especially in the case of El Salvador. Hence, increasing financial inclusion would be a tool for strong financial development. El-Salvador's acceptance of Bitcoin as a legal currency besides the dollar aroused curiosity around the world. The sustainability of this situation and its possible effects on economic development and financial inclusion are the most curious subjects.

The fact that not enough time has passed since the adoption of Bitcoin as a legal currency causes the issue to not be evaluated empirically. On the other hand, the difficulty in accessing financial inclusion data on El-Salvador can be considered as one of the most fundamental limitations on the subject. However, the information obtained from the official organs of the state, academic studies, and social media platforms indicate that the financial inclusion figures in the country are increasing rapidly. It is considered that more comprehensive empirical studies can be carried out after obtaining numerical data on the subject.

Therefore, the aim of the study is to analyze the impact of policies towards facilitating access to financial instruments through Bitcoin usage, on the financial development. The link between Bitcoin usage data and financial inclusion and the progress of the impact of Bitcoin are described using a descriptive method in this study. Despite the lack of sufficient data to perform detailed empirical evidence of the subject, this study will be the very first discussion of the context in the literature. It has been revealed with the outcomes of study that policies for increasing access to financial instruments, have positive effects on the financial access levels on the country. Hence, easing the usage of financial instruments help to enhance financial development in El Salvador.

1. BITCOIN AS A LEGAL TENDER

Factors such as the fact that global economic crises easily affected all countries and governments could not develop a solution, the fragilities in the values of traditional currencies, and the decrease in trust in credit rating institutions played a big role in the formation of cryptocurrencies (Balta, 2021). The first and largest of the existing cryptocurrencies is Bitcoin with a transaction volume of approximately 892 billion dollars (Dünya, 2022).

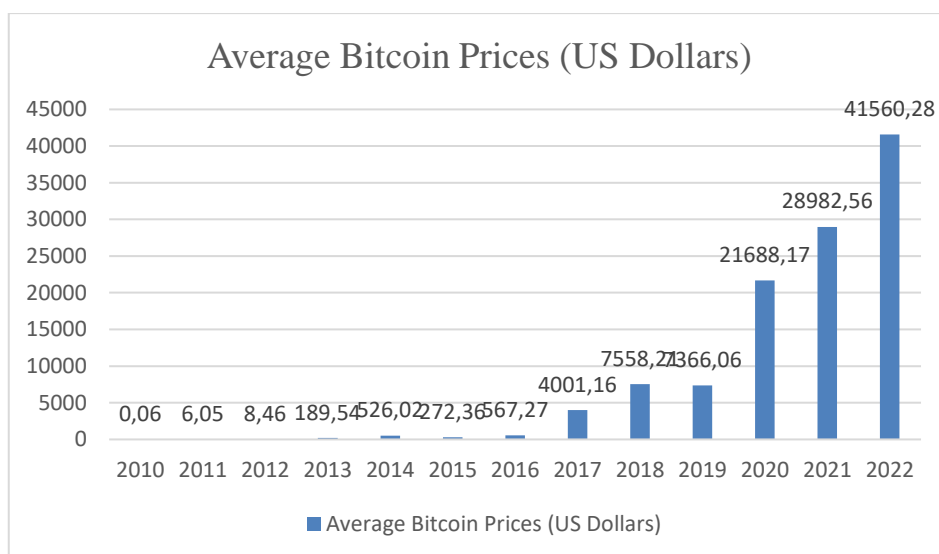


Figure 1. Average Bitcoin Price by Years (US \$)

Source: Investing.com, 2022

Bitcoin, which does not have any physical form and whose average price is constantly increasing over the years, is a currency that is based on mutual trust between users and is not under the sovereignty of any state or individual. The Bitcoin transaction records, which are formed on the basis of the blockchain, are kept securely and all users can see these records transparently (Aksoy, 2018).

In addition, the intense interest in Bitcoin continues to increase due to the financial freedom it provides, its transparent structure and its secure storage against cyber-attacks. As of 2018, Bitcoin has increased in value against all reserve currencies. The main reason for this increase can be shown as the rising demand and the restrictive policies of the Chinese State regarding money transfers sent abroad (Aksoy, 2018).

The increase in demand for online shopping with the pandemic process and quarantine measures that emerged in the following years, the UK's Brexit decision, the exacerbation of the current trade wars between the USA and China, and finally the war between Russia and Ukraine increased uncertainties around the world and this situation caused a decrease in trust of credit rating agencies and governments. On the other hand, this situation has led to an increased interest in free and independent cryptocurrencies, which are closed to outside interference, apart from existing currencies (The Conversation, 2021).

Table 1. Bitcoin vs. Traditional Bank Model

Bench Marks	Bitcoin	Traditional Bank System
Supervision/Control	Common consensus	Central Banks
Transaction Confirmation	Common consensus	Confirmation from the Center

Additional Generation	Coin	Mining	Loans
Value		Supply/Demand, Confidence	Exchange Rate
Source		Limited	Unlimited
Transfer		Direct/Recoverable	Via Agent/Irreversible

Source: Tschorsch and Scheuermann, 2016

Although it has many advantages over the traditional bank and money system, it is considered that the Block chain Technology-based Bitcoin system has aspects that need to be developed;

1. Security

Thefts through hacking in Bitcoin clearinghouses can be considered as a security vulnerability. In addition, the lack of attention to multi-signature security technology and the problems in the use of cold wallets can be considered as another vulnerability (Ünsal and Kocaoğlu, 2018).

2. Regulations and Financial Integrity

Legal regulations are a vital issue for the active use of bitcoin technology. One of the main concerns with cryptocurrencies is the risk that they can be used for money laundering and terrorist financing. On the other hand, the lack of adequate support from public administrations and central banks is a major disadvantage for bitcoin (Lumb, 2016).

3. Level of Performance and Scalability

Bitcoin usage rate is increasing day by day. In case the usage rate increases and becomes widespread, it is considered that block chain technology will not be able to meet the increasing needs with its existing technical infrastructure.

4. Financial Stability

Banks and other financial institutions can be subject to large fluctuations in the cryptocurrency market. To cope with these fluctuations, they need to develop new prudential rules and strengthen their reserves (IMF, 2022).

5. Customer Safety

Households and businesses who hold Bitcoin balances and save in Bitcoin could lose wealth through large swings in value, and in a digital environment, cybercrime and theft is always a risk. Possible solutions regarding the issue are as follows: a. Legal regulations regarding e-wallets should be developed, and b. Limits should be placed on bitcoin transactions and holdings (IMF, 2022).

6. Contingent Financial Liabilities

If bitcoin is accepted as a legal currency, it must be financed by a public 'safe fund'. The money in this fund can quickly run out when there are sudden and hard downwards in the price of Bitcoin. If governments want to continue to guarantee convertibility between bitcoin and the US dollar, they may

need additional funding or debt insurance (IMF, 2022).

2. RELATED WORKS OF THE CONTEXT

The blockchain technology is described as a distributed ledger, which consists of blocks in which the systematic transactions are recorded in detail, and accessed by different users (Devravut, 2018). The first application area of blockchain technology in the world came to the fore with Bitcoin in the financial sector, and Bitcoin transactions and technology recorded in the blockchain system were explained in detail (Nakamoto, 2008).

Bitcoin transactions can be made with an internet-based application called "Bitcoin wallet", which is used free of charge (Kurt, 2018), and users can quickly transfer money using each other's Bitcoin addresses. Users who make Bitcoin transactions do not have to get approval from any authority or institution before executing their transactions.

Moreover, it is also possible for users to own Bitcoin by paying on virtual currency exchanges. In terms of usage, although Bitcoin provides significant advantages to its users when compared to fiat currencies, some negative situations (such as exposure to cyber-attacks, and loss of deposits) that require attention and precautions may also occur (Güleç, 2018).

On the other hand, the virtual nature of Bitcoin makes Bitcoin independent from states, unlike fiat currencies. Since Bitcoin is not affiliated with any government, governments or financial institutions do not have access to Bitcoin wallets. Therefore, money in Bitcoin wallets cannot be blocked (Bitcoin, 2018).

İçellioğlu and Öztürk (2018) also applied unit root tests to examine the relationship of Bitcoin with fiat currencies and found that Bitcoin has no relationship with fiat currencies.

Üzümcü and Yıldırım (2020) stated that legal uncertainties with cryptocurrencies continue in their study examining the legal status of cryptocurrencies. According to their assessment, their legal infrastructure should be strengthened so that cryptocurrencies can be used as a capital market instrument.

The extent to which the adoption of Bitcoin as a legal currency in El-Salvador contributes to financial inclusion and financial development in the country has been one of the important research topics. In this context, Fernando (2022) stated in his study that Bitcoin is not only used as a legal currency in the country but also as a means of payment. He also explained that the incentives and supports offered by the government encourage the public and investors. In this context, the number of those who downloaded the application called Chivo has increased rapidly and citizens have started to acquire the habit of trading on Bitcoin.

3. A CASE OF EL SALVADOR

El Salvador, one of the smallest countries in Central America, is on the Pacific Ocean and borders Guatemala to the west and Honduras to the north and east. In addition, El Salvador is the smallest country in Central America by area. In terms of the number of people per square meter, it is the place with the highest population density in the Americas. On the other hand, it is one of the most troubled

areas of the entire continent. They have not yet fully recovered from the wounds of the civil war that started in 1980 and lasted for 12 years. The number of people who lost their lives in this civil war is about 75 thousand people. In addition, El Salvador, along with Honduras, is home to MS-13 (Mara Salvatrucha), one of the most dangerous gangs in the world (insamer, 2022).

The official language is Spanish, and the population of the country is approximately 6.5 million. The most populated city in the country is the capital, San Salvador (World Bank, 2022). On the other hand, the population of El Salvador is around 6.5 million, but at least 2-3 million citizens are trying to live in the USA. The amount of foreign currency that these workers bring into the country provides substantial benefits to the country's economy. As follows; remittances inflows to El Salvador in 2016 are 4.6 billion dollars, which corresponds to 80% of El Salvador's total exports. Apart from the United States, the country's trading partners include China, Guatemala, Honduras, Nicaragua, Colombia, Costa Rica and Taiwan (World Bank, 2022).

On the other hand, the main agricultural products of El Salvador, especially coffee, are sugar, rice, corn, beans, oilseeds and cotton. Developing industries are; petroleum, textiles, chemicals, fertilizers, furniture and light metals. El Salvador coffee is one of the best coffees in the world, although its name remains in the background due to the internal and external problems it has experienced (insamer, 2022).

The chairman of El-Salvador is Nayib Bukele, who is both very young and very innovative. After Bukele took office in 2019, he took many new steps to revive the country's economy. The most important and notable among these steps was, of course, the recognition of Bitcoin as a legal currency. With the recognition of Bitcoin as the legal currency, the country started to use Bitcoin and Dollar as the two official currencies. The country, which recognized the dollar as its official currency in 2001, was able to attract foreign investors to the country, and this contributed greatly to the development of the country. It is considered that the main reason for President Bukele to declare bitcoin as a legal currency is to attract foreign investors and capital to the country.

The recognition of Bitcoin as a legal currency has managed to attract the attention of all world authorities. Especially the sustainability of this situation and its possible effects on the economy are among the most curious subjects. It is seen that the use of bitcoin has increased rapidly in the country where Bitcoin has been used as a legal currency since September 2021 (economic times, 2022).

In addition, in the country where the minimum wage is \$ 365, approximately 4 million of the 6.5 million population have actively opened and used Bitcoin accounts. The main way to open a Bitcoin account is to download the application called 'Chivo'. In addition, only citizens of El-Salvador can use this application. Also, the government gives a gift balance of 30 US dollars to all citizens who open an account to encourage the Chivo application.

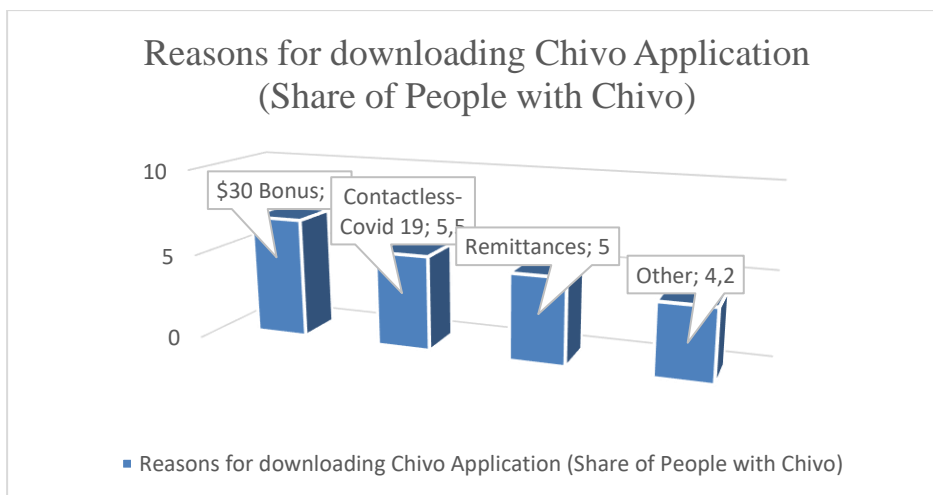


Figure 2. Reasons for downloading Chivo Application

Source: Fernando, 2022

Every citizen who opens an account by downloading the Chivo application gets a unique 'digital ledger'. All Bitcoin transactions can be tracked on this ledger and the data is not deleted. Currently, there are 200 Chivo ATMs in the country, and preparations are underway for this number to reach 1500 in the near future (economic times, 2022).

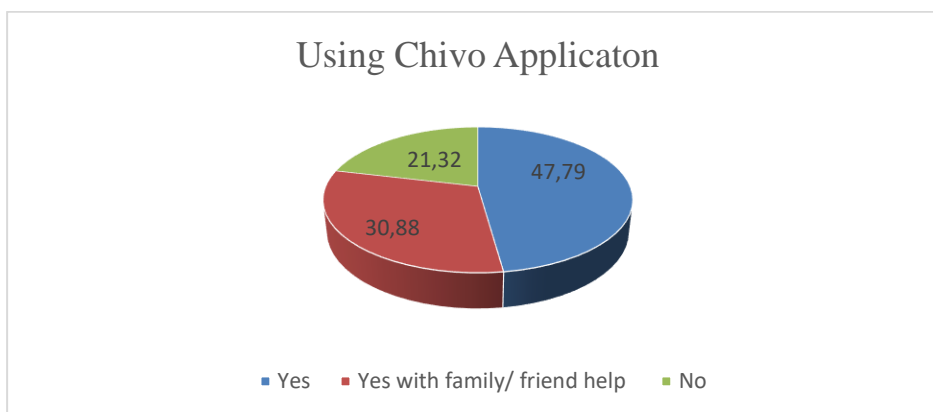


Figure 3. Using Chivo Application

Source: Fernando, 2022

Moreover, Bitcoin has around \$604 billion worth of money worldwide. About \$5 billion of the 604 billion dollar capital is located in El Salvador. Considering the country's population of only 6.5 million, this rate quite high.

On the other hand, the most striking feature of 'financial inclusion' after Bitcoin started to be used as a legal currency is that 70% of those who started trading by downloading the Chivo application did not have any bank account before. It is seen that citizens can easily use the Chivo application, which is very easy to use, and can easily convert their dollars and bitcoins to each other by using Chivo ATMs when they need it. On the other hand, with the use of Bitcoin and digital wallets, citizens will be able to save money on remittance fees, which average 400 million dollars per year (BBC, 2021).

The government continues its efforts to attract foreign investors to the country. Anyone who owns only 3 Bitcoins can easily obtain residence in the country and obtain the right to become a citizen approximately 1 to 5 years after obtaining residence. In addition, one of the biggest advantages provided by the Bukele government to foreign investors is tax support. In this context, investors/companies that bring bitcoin to the country are exempted from income and corporate taxes (rree, 2022).

In addition, in the country where all payments to the government can be made in bitcoin, one of the biggest projects of the Bukele government is to establish a 'Bitcoin City' (rree.gov.sv, 2022). On the other hand, the government, which has accelerated its activities in order to attract foreign investors to the country, plans to issue 10-year bonds of \$ 1 billion in the near future. It is seen that the incentives made have started to pay off and many of the international companies have come to the country and started to open branches (BBC, 2021).

On the other hand, one of the most fundamental criticisms of Bitcoin mining around the world is the damage to the environment. El-Salvador differs positively in this aspect as well. Electricity is produced in the country by using active volcanic energy. The electrical energy obtained is connected to computers dealing with bitcoin mining in specially produced containers. The country that produces electricity with eco-energy does not harm the environment in this respect (IMF, 2022).

In addition to its advantages such as being easy to use and access, and not being under the control of any government or person, there are also some criticisms and warnings brought to El-Salvador regarding the use of Bitcoin as a legal currency.

It has been evaluated that the recent increase in El-Salvador's public debt and the risks in finding new financing may lead to deviations in the medium-term growth plans. In the same report, the economic relationship between the USA and El-Salvador was emphasized. According to the report, about one-fifth of El-Salvador's population lives in the United States. The remittances sent by this population, which has an important lobby in the USA, to El-Salvador make a great contribution to the Salvadoran economy. In the evaluation, it has been determined that approximately 25% of El-Salvador's GDP in 2021 consists of remittances from the USA (IMF, 2022).

On the other hand, the growth rate of the country is expected to fall below 2% due to the decrease in US policy incentives. It has been determined that the main reason underlying the decrease in incentives is the high public borrowing costs in the country. It has been observed that expansionary fiscal policies and permanent budget deficits are very effective in increasing the public debt/GDP ratio. In the assessment made by the IMF, it was stated that taking decisive policy measures and reducing borrowing costs would contribute to the reduction of the resources coming out of the budget for this purpose. Otherwise, it has been evaluated that this level of indebtedness cannot be sustained and this situation will cause the exclusion of private investments and sufficient resources cannot be allocated for social expenditures and infrastructure (IMF, 2022).

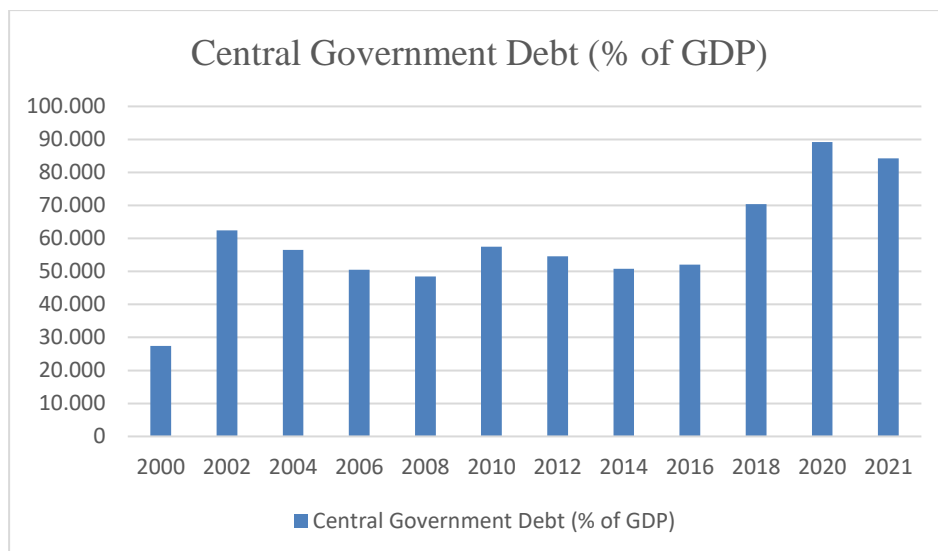


Figure 4. Central Government Debt (% of GDP)

Source: World Bank, 2022

The IMF proposes a permanent reduction policy to be implemented over a three-year period as part of the fight against increasing indebtedness. It is evaluated that this policy will rapidly reduce the debt/GDP ratio and provide the necessary fiscal space for social and inclusive growth. On the other hand, other suggestions offered by the IMF within the scope of ensuring growth and macroeconomic stability are as follows;

1. To make improvements in the framework of governance,
2. To make legal arrangements to minimize the risks arising from Bitcoin,
3. Adopting support policies for citizens who suffer from fluctuations in Bitcoin prices,
4. To implement the package of measures fast to be taken in order to facilitate future policy choices and reduce risks (IMF, 2022).

CONCLUSION

Both offering an alternative to traditional payment methods and technological innovations in its infrastructure are the factors that play a role in Bitcoin's prominence and prevalence. In addition, it is considered that the virtual structure of Bitcoin and the possibility of free transfer are effective for users. On the other hand, the monopoly of no power or state and the high-level security infrastructure make cryptocurrencies and Bitcoin in particular attractive.

In addition to its many advantages, there are also some problems with the use of Bitcoin. The most important of these are the inability to recover the payments made, the risk of being exposed to cyber-attacks, and the lack of any government guarantee regarding the deposits.

On the other hand, it is seen that the policies of the world's largest economies such as the USA and China towards Bitcoin cause significant changes in the value of Bitcoin. However, although the

meaningful changes in Bitcoin value are often interpreted as stemming from the US and China policies, it is seen that Bitcoin changes in the same direction not only against the Dollar and Yuan, but also against all reserve currencies. Therefore, although Bitcoin has a structure independent of states, it is seen that it is affected by the policies or regulations of strong economies and this plays a critical role in value change.

El-Salvador's acceptance of Bitcoin as a legal currency besides the dollar aroused curiosity around the world. The sustainability of this situation and its possible effects on economic development are the most curious subjects. The fact that not enough time has passed since the adoption of Bitcoin as a legal currency causes the issue to not be evaluated empirically. The difficulty in accessing financial inclusion data on El-Salvador can be considered as one of the most fundamental limitations on the subject.

On the other hand, it is seen that even citizens who do not have a bank account before started to use Bitcoin thanks to the Chivo application. This situation can be considered as one of the most concrete developments regarding financial inclusion. The rapid increase in Chivo ATMs in the country and the fact that even the smallest businesses accept Bitcoin as a payment tool can be considered as other positive developments. In addition, it is considered that eliminating the problems experienced while using Bitcoin (such as irrevocable payment, electronic failure, cyber-attack, lack of state security) can positively affect the use of Bitcoin and highlight its advantageous structure.

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Fikir veya Kavram / Idea or Notion	Araştırma hipotezini veya fikrini oluşturmak / Form the research hypothesis or idea	Recep YORULMAZ Mehmet Oğuz TAÇYILDIZ
Tasarım / Design	Yöntemi, ölçeği ve deseni tasarlamak / Designing method, scale and pattern	Recep YORULMAZ Mehmet Oğuz TAÇYILDIZ
Veri Toplama ve İşleme / Data Collecting and Processing	Verileri toplamak, düzenlenmek ve raporlamak /	Recep YORULMAZ Mehmet Oğuz TAÇYILDIZ

	Collecting, organizing and reporting data	
Tartıřma ve Yorum / Discussion and Interpretation	Bulguların deęerlendirilmesinde ve sonulandırılmasında sorumluluk almak / Taking responsibility in evaluating and finalizing the findings	Recep YORULMAZ Mehmet Oęuz TAYILDIZ
Literatür Taraması / Literature Review	alıřma için gerekli literatürü taramak / Review the literature required for the study	Recep YORULMAZ Mehmet Oęuz TAYILDIZ

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