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THE ROLE OF THE STATE IN DEVELOPMENT WITH BLOCKCHAIN TECHNOLOGY ON THE FLOOR OF INFORMATION TECHNOLOGIES

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Abstract

Blockchain is characterized as a public ledger of information or data collected over a network located on the Internet. The groundbreaking potential of Blockchain is the technology it uses to record this data or information given to it. Based on Blockchain, as the name suggests, there is a working system based on a chain reaction. In this study, information technologies as a result of digitalization in the globalizing world and the relationship of blockchain technology, which is described as the biggest revolution after the internet, with development and the mission relationship undertaken by states are emphasized. In addition, the role of information technologies, which are among the most important building blocks of the digital economy by quickly penetrating all areas of life, on development has been mentioned. After defining information technologies in the study, the position and importance of blockchain technology were emphasized and its role in development was discussed. As a result, it has been concluded that blockchain technology is seen as creative destruction in development and increases the efficiency of the public and private sectors. Countries need to benefit from this technology, as productivity provides long-term development. However, the physical conditions of the countries shape the policy measures they will take. It is believed that it is important for the development that countries use blockchain technology by spreading it over a period of time.

Keywords: Blockchain, Information Technology, Development, Digital Transformation.

JEL Code: O33, M15, O1.

1. Introduction

The globalizing world has paved the way for the emergence of many concepts. With the use of computers in the 1990s, a transformation began to take place. The wind of change with information technologies causes the emergence of new technology with the phenomenon of virtual money. In this context, economies, governments, and societies around the world are becoming digital.

Digital technologies are developing rapidly, and as a result of the improvement of the communication infrastructure and the widespread use of smartphones and computers, the production and storage of data becomes of strategic importance. So much so that blockchain technology promises to solve exactly this problem. Thanks to its features, it is considered the biggest revolution after the internet revolution and the processes of integrating this technology by societies are accelerating day by day.

The ongoing digital transformation of the economy and society holds many promises to drive innovation, create efficiencies and improve services while increasing productivity growth. Digital technologies also facilitate the participation of people in economic and social activities. However, as digital transformation changes the nature and structure of organizations, markets, and communities, it also raises issues of jobs and skills, privacy, and security. The transparency of blockchain technology and the fact that it works without being tied to any authority or institution behind it is an alternative to the solution to this problem. The study aims to determine the role of the state in the development of blockchain technology. In this context, firstly, the conceptual framework of information technologies was drawn and blockchain technology was explained. Finally, a link has been established between blockchain technology and development.

2. Conceptual Framework of Information Technologies

In a narrow sense, the system IT is a concept that compiles, stores, and processes data in a simple way and is defined as the accessibility of information obtained through various technologies. It is a structure that allows it to be opened, stored, and transmitted efficiently (Şahin & Topal, 2016: 1). According to another definition, computerised information systems, especially the processing of information in the management and development of software and computer hardware, are to shop, transmit protect and provide secure access (Kahraman, 2019: 1).

2.1. The Latest Link in Digital Transformation: The Concept of Blockchain

Technologies that emerged as a result of the acceleration of digital transformation in the last ten years; e-mail, social media, mobile web, cloud computing, the internet of things, and blockchain technology. Although blockchain technology, which is described

as the architectural building block of the new era, is mentioned together with Bitcoin, it is expressed as the general name of the technology behind Bitcoin.

The concept of blockchain, which was first proposed as a research project in 1991, e-Donkey and BitTorrent, which emerged as two independent projects in the early 2000s, are used to share data with other people we do not know but with whom we can communicate, or rather machines, on the internet. they emerged as a kind of data storage solution developed end-to-end called “Peer to Peer - P2P” (Usta & Doğantekin, 2018: 20). The first use of the blockchain is with Bitcoin in 2009. Since then, the use of blockchains has evolved with various variations. These; various cryptocurrencies are used through the decentralized financial system (DeFi), smart contracts, and non-tradable tokens (NFTs) (Hayes, 2022).

In the study titled "Bitcoin: A Peer-to-Peer Electronic Cash System" published by a person or persons with the pseudonym Satoshi Nakamoto, although Bitcoin is described, the existence of a new technology behind it is emphasized. In the aforementioned technology, transactions can be made without the need for the presence of third parties with the distributed registration system. This technology plays a key role in the emergence of digital-based social and economic models, as well as in financial markets and the conclusion of contracts, eliminating the need for a trusted third party as a guarantor (World Economic Forum, 2015: 5). Undoubtedly, it is the features of the blockchain that make it so important. This technology has three essential features (Ramada, 2016):

a. Decentralized distributed ledger technology system,

b. The fact that every information recorded in the system is non-recyclable and indelible,

c. Before starting the process, authentication is done and each user has a personal private key (password).

2.2. Distributed Technology

The structure of the basic working method of blockchain technology is based on “distributed ledger technology”. Distributed registry system, in other words, is based on keeping data secured by multiple control mechanisms rather than keeping it in a single center. Thus, the problems of corruption, destruction, deletion, and attack that can be experienced by keeping them in a single center are eliminated (Güven & Şahinöz, 2018: 74). It is protected with a cryptographic structure against a possible attack and is stored permanently (Wenke et al., 2022: 3).

DLT has the feature of being a central database. Because of this feature, it represents a digital collection. Distributed ledger technology has been referred to as “Worldwide Ledger” (Tapscott and Tapscott, 2016: 7). According to the World Economic Forum, blockchain is expressed as a technology protocol that enables the direct exchange of data between two parties without the need for an intermediary (The World Economic Forum, 2018).

When we look at the working process of the blockchain, it is seen that the process begins with the creation of a block simultaneously with the entry of data into the system. A block is in the system at the same time as the transaction is created. It spreads it to the nodes that make up the entire chain in the network and ensures its proliferation. One of the nodes verifies the block, which in practice is called mining. The miners re-spread the network to form blocks (Banerjee et al., 2018: 156).

2.3. Smart Contract

The concept of smart contracts was first used by Nick Szabo. In his articles published in the early 1990s, he defined smart contracts as "protocols in digital form that fulfill the promises of the parties"(Szabo, 2022). Although the blockchain system first entered our lives as electronic money, the first practical use of smart contracts on a blockchain was seen in the Ethereum protocol in 2015. The main innovation of the Ethereum protocol, the Ethereum Virtual Machine (EVM), was software that runs on all nodes in the Ethereum network and is the building block of a distributed virtual computer. This distributed virtual computer is capable of operating smart contracts coded by users. Thus, today, there are tens of blockchain protocols with the ability to run smart contracts and tens of thousands of smart contracts running on these protocols. Smart contracts, which are characterized as computer programs in which automatic actions are executed in return for the fulfillment of predetermined conditions between two or more parties, eliminate intermediaries and ensure that processes are operated automatically, quickly, and at less cost. Smart contracts, one of the most critical components of the blockchain, have characteristic features of blockchain technology such as security, immutability, and transparency (Smart Contract Report, 2021).

3. Blockchain Technology: Its Relationship With Development

Economic growth includes only increasing production capacity, while economic development includes some social, political, and cultural variables as well as economic growth. However, in Turkish, these two concepts are often used interchangeably, and in this study, the word economic development is based on economic growth. In this context, the focus of the study is to shift the production possibility curve or the aggregate supply curve to the right in the long run with blockchain technology. Multiple factors determine economic growth, and one of them is technology. Technological development increases productivity with the innovations it creates in the organizational structure and production phase (Ertek, 2016: 389-390). However, it should be emphasized that economic growth, in the long run, is only achieved by productivity growth. Technology is perhaps the most important factor in increasing productivity (Krugman & Wells, 2011: 230-231). Because the discovery, application, and dissemination of new technologies have a great contribution to economic growth (Yıldırım et al., 2016: 281). In this respect, technological development constitutes exponential growth (growth built on old growth) (Acemoğlu et al., 2016: 150). However, when growth theories are examined, some models take technology internally and

externally. The study is based on Kaldor's growth theory, which considers technology as an intrinsic factor (Llerena & Lorentz, 2004: 3).

In the development of countries with blockchain technology, countries have been reduced to three different categories due to the generalizability of social sciences and internal growth models. In this framework, groups of blockchain experts should be formed in low and middle-income countries, investments should be made in graduate programs in advanced STEM fields, blockchain associations and incubation centers should be established, pilot programs for blockchain should be established, and developments obtained as a result of these programs should be integrated into existing platforms (UNCTAD, 2021: 34-37). In upper middle-income countries, a national blockchain strategy and accordingly directives should be established, blockchain centers should be established, groups of blockchain experts should be formed, important areas of use for blockchain technology should be determined, and national and international strategic collaborations should be established (UNCTAD, 2021: 37-40). In high-income countries, a blockchain development committee should be established, synergies should be ensured through research and development, and innovation should be encouraged (UNCTAD, 2021: 40-41).

4. Conclusion

From the past to the present, development economists have conducted studies on the development differences between countries and focused on why some countries are more developed. In contrast, other countries are not so developed. In this context, technology is a factor that partially explains this difference and is an important factor in the development of countries. While some economists have evaluated the effect of technology on development effect internally, other economists have considered it externally.

Today, blockchain technology, which increases the efficiency of the public sector, which is expressed as an inefficient sector by Baumol, and which, as expressed by Schumpeter, is within the creative destruction required for the necessity of development, provides uncertainty and productivity increase in many areas. These areas are; food security, finance, foreign trade, taxation process, public administration, internal audit, health, logistics, education, etc. can be listed as.

The differences in the physical conditions of the countries enabled the countries to be examined in separate categories. This framework requires investment in these areas primarily due to the lack of technology and the lack of qualified personnel in low and middle-income countries. Upper middle-income countries should make this technology a national strategy and invest in human capital, although it is better than the countries in the last category. In high-income countries, incentives should be given to research and development since there is no human capital problem.

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