Embracing the Metaverse: Mechanism and logic of a new digital economy

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ABSTRACT

The Metaverse refers to virtual world and survival vision in which human beings will be more deeply engaged. It is initiated in game platforms and based on the innovation and circulation of digital currency and dependent on the development of digital technology and devices. The Metaverse craze hit China in 2021 for various reasons, such as the systematic change of the Internet protocol due to the development of block chain technology, more involvement in virtual life due to the COVID-19 pandemic, the aggravated crisis of old global narrative, and new patterns emerging in digital economy following PC digital economy and mobile digital economy. The Metaverse economy is a new digital economy different from the previous digital economies due to the emergence of digital currency along with the development of digital legal currency, and a series of new production and business models around digital assets. What underlies this new digital economy is the fact that digital currency is no longer controversial cryptocurrency and that several central banks have agreed to issue digital legal currency. The new digital assets in the form of NFT or NFR backed by the distributed ledger technology will bring a variety of reforms in business models and big upheavals in production, circulation, and consumption patterns. The interaction between digital and physical assets will create new economies. In the Metaverse economy where recognition determines value, in terms of technology it is possible to capitalize on the values such as cultural value, historical value and aesthetic value. This will give rise to more diverse economies and expand global economy.

Keywords: Metaverse; new digital economy; blockchain technology; digital currency; digital assets; new value theory

1. Introduction

2021 is generally defined as the first year of “Metaverse” by academic and industrial circles. This term, originally from Neil Stevenson’s science fiction avalanche in 1992, reappeared in the prospectus submitted by American game company Roblox in March 2021 nearly 30 years later. With the successful listing of Roblox on the New York Stock Exchange and the rising market value, the concept of “Metaverse” began to enter reality from science fiction and became an upsurge pursued by the capital market. In China, first of all, the company competed with its rivals at no cost and successfully acquired Pico, the domestic leader of VR head display. Then there was the crazy rise of Metaverse concept stocks
in the secondary capital market, and the word “Metaverse” gradually opened its “drip” diffusion. On October 29, 2021, the American Internet social networking giant Facebook officially changed its name to meta and announced that Facebook would completely transform into a Metaverse company.

There are two completely different attitudes towards the outbreak of the concept of Metaverse in 2021: One is to actively embrace new concepts and new trends and believe that the Metaverse represents a new direction of future development. The other is cautious. According to the fact that VR/AR and other hardware facilities have not been popularized to real life, it is judged that this is just a gimmick hype. So how should we understand the powerful concept of Metaverse?

Based on the continuous innovation of digital technology, this paper points out that the concept of Metaverse that broke out this year is not hype. It has its internal creation mechanism to adapt to the stage of technological, social and economic development. Its essence is the development of a new digital economy with clear growth logic based on the systematic reform of Internet technology.

2. What is the Metaverse?

An important reason why the concept of Metaverse has aroused extensive discussion and controversy is that its term originates from science fiction. At present, it is generally accepted that the word “Metaverse” first appeared in Neil Stevenson’s novel Snow Crash (1992). The author envisions it as another space-time parallel to the real world. In the past two years, two Hollywood films, the number one player (2018) and the out of control player (2021), have directly demonstrated the living conditions of people’s “Metaverse” after the integration of virtual and real worlds in the future, attracting many eyes and heated discussions. However, no matter the VR head display device and somatosensory device in the number one player or the AR/sunglasses in the out of control player, there are not enough powerful products to match them in our current real life. Just because the concept of Metaverse has strong sci-fi attribute, the current “parallel” virtual world is also out of reach, which paves the way for the debate of Metaverse.

It is worth thinking about why the concept of Metaverse will explode in 2021 and become a topic of great interest in capital circles, scientific and technological circles, research circles and even the general public? What year 2021 will be recognized as the “frontier of the universe” by scholars in the industry?

The first landmark event of the concept of Metaverse from virtual to real came from the listing of American sandbox game company Roblox on the New York Stock Exchange on March 10, 2021. As the first listed company to write “Metaverse” into its prospectus, its share price soared by 50% on the day of listing, once rising from the reference price of $45 per share given by the New York Stock Exchange to $103 per share, with a total market value of $40 billion, an increase of nearly 10 times compared with the financing valuation of $4 billion before listing in 2020. There is enough data support behind the craze in the capital market: In the fourth quarter of 2020, Roblox’s average daily active users reached 37.1 million, of which 490,000 paid for its game platform currency (Robux). From January to September in 2021, users accumulated $1.2 billion in recharge, including $590 million in consumption. In 2020, Roblox’s revenue was 924 million US dollars, with a year-on-year increase of 80.39%. In addition to the bright data, Roblox differs from other game platforms in two points: First, the experience on Roblox platform comes from both the game library constantly built and updated by the platform creator and the players in the game community. Players can output content and create experience by themselves with the creator development tools provided by the platforms a “experience” creation platform with the attributes of game, development and education, Roblox users have created more than 20 million game experiences by the end of 2020 Second, Roblox promises the two-way exchange of digital token Robux and legal
currency USD, and has built its own closed-loop economic system. On Roblox, users can not only buy tokens in legal currency for entertainment and consumption, but also earn Robux by developing and creating game experience. Robux can be reinvested in the game platform or converted into legal currency through the platform. Although similar Play to Earn (PTE) games have existed for a long time, in the past, on the PTE game platform, users can obtain platform digital tokens by playing games, and can also reach transfer agreements with other users offline. However, the platform promises players that game tokens can be exchanged with legal currencies in both directions. Roblox is the first company, which is of epoch-making significance. In 2020, more than 1.2 million developers earned Robux, of which 1,250 developers earned up to $10,000 and more than 300 developers earned up to $100,000.

In fact, it is almost a consensus in the industry that the prototype version of “Metaverse” starts from the game platform or game scene. Nowadays, the development of the game industry has given players enough freedom of creation. With the help of the development tools provided by the game platform, people can build scenes like those in real life or create new scenes in the game, to complete the gatherings that originally took place in real life. In 2020, American rapper Travis Scott held virtual concerts “Astronomical” in the game “Fortnite”, each across servers in the United States, Europe, Asia and Oceania. According to official statistics, the event attracted more than 12 million players to participate online at the same time. Also in 2020, the top academic conference Acai (International Conference on algorithms, computers and artificial intelligence) held a seminar at Nintendo’s Animal Crossing. Participants played PPT in the game and delivered speeches. On June 16, 2021, graduates from the school of animation and digital arts of Communication University of China built a virtual building in the game according to the actual shooting of campus scenery in the game Minecraft, restored the style of the campus, and held a graduation ceremony on it.

If the above breakthrough attempts in the digital virtual world are only sporadic cases, then on October 29, 2021, the American social media giant Facebook announced that it would change its name to meta, and declared that the Metaverse would subvert the future human society. They would fully invest in the Metaverse in the future, which indicates that the science and technology industry is making a long-term layout for a systematic social change Facebook CEO Zuckerberg regards Metaverse as the “next generation Internet”, while NVIDIA CEO Huang Renxun asserts that the economic scale of Metaverse will be larger than that of the physical world. This means that the Metaverse is a historic opportunity related to technological and economic development.

Compared with the western world’s enthusiastic embrace of new concepts, East Asian society is slightly cautious, although. Tencent cooperated with Roblox to develop the Chinese version of Roblox in 2019 and invested in Roblox in 2020 $500 million, but instead of advocating the Metaverse, it puts forward the concepts of “full truth Internet” and “super digital scene” with similar connotation. Based on the inevitable trend of human digital technology development, the laboratory cooperated by Hitachi production Institute of Japan and Tokyo University puts forward the concept of “society 5.0”[1], which will evolve into a super intelligent society integrating virtual world and real world in a more simple way in the future.

Although the word Metaverse comes from science fiction, it has evolved the characteristics of economic closed-loop system in the iterative development of the game industry, and puts forward a new possibility of the combination of virtual and real in the future survival mode of mankind. It has become a new trend predicted by industry practitioners and social researchers in different social and cultural contexts. Therefore, although the Metaverse is not a perfect final reality at present, it can be understood as a dynamic evolution process of application prototype, technical foundation and new model of economic system. Driven by the logic
of technological iteration and capital appreciation, its end will point to all the possibilities of human life in the virtual and real binary world in the future. In fact, Metaverse is a virtual world and survival vision that starts from the game platform, is based on digital currency, and is supported by the synchronous emergence of a series of integrated digital technologies and hardware technologies, in which human life is deeply involved.

3. The creation mechanism of Metaverse economy

The so-called creation means that things can be opened and have the starting point of unlimited development. The outbreak of the concept of Metaverse this year has its long hidden brewing in many ways. The academic circles have put forward the concept of “Metaverse economics” and believe that Metaverse economy is the most active and revolutionary part of digital economy. Specifically, the creation of Metaverse economy has the following mechanism.

3.1. Technology creation mechanism: Digital technology ecology and blockchain

The prototype of Metaverse based on digital technology ecology

There is a basic consensus in the industry on the evolution process of Metaverse, that is, Metaverse version 1.0 has been realized in the game, which simulates or creatively constructs some scenes in real life on the game platform, and people with real identity complete corresponding social activities in digital scenes, such as holding concerts, academic conferences, graduation ceremonies, etc. Metaverse version 2.0 enters a 3D full truth interconnection stage with the help of VR display devices and other somatosensory devices. At this time, the interface for human beings to enter the Internet is no longer a PC computer or a smart phone with two-dimensional screen, but a hardware device such as VR head display that directly brings human beings into the digital three-dimensional world. At present, Microsoft, Facebook, NVIDIA and other companies are actively developing such applications. For example, the horizon workrooms application developed by Facebook is a new network interconnection mode equipped with its VR device Oculus Quest2. Metaverse version 3.0 is the imagination of human beings to realize digital twins or digital primitives in the virtual world. This is the scene presented in Spielberg’s sci-fi film “the number one player”: Human beings can use the application developed by the game platform to have their own digital avatar in a virtual universe that not only maps real-life scenes, but also has infinite native scenes. The digital avatar can entertain, consume and even produce in the virtual universe Metaverse version 4.0 is superimposed with artificial intelligence and other technologies to realize the reverse influence and penetration of the virtual world into the real world. After the demise of the biological body, real humans may realize digital immortality in the digital world through various virtual and real integration technologies.

The development of Metaverse is inseparable from the collective explosion of a series of digital technologies in recent years, including but not limited to the information transmission revolution represented by 5g/6G and Web 3. The Internet revolution represented by 0, the artificial intelligence revolution represented by algorithm and machine learning, and the hardware technology revolution represented by VR, AR, Mr and XR. In addition, it also includes data acquisition and data processing represented by big data and cloud computing, distributed governance represented by blockchain and digital finance represented by digital currency based on it. If the ultimate imagination of the Metaverse is a grand systematic change, then from the most fundamental technical level, what technology redefines the possibility of the Internet in what sense?

Subversion of blockchain technology to existing Internet underlying protocols

Reviewing the development history of the Internet, the Internet based on TCP/IP protocol first designed by Harvard University, MIT, Stanford
University, University of California, Los Angeles, BBN company and Rand Company in 1971 was used by the U.S. military. At that time, there were only a small number of nodes in the Internet, which supported the end-to-end black box method, which was uncontrollable and unattractive, and did not allow participants to control the interior of the network. Therefore, those node units that joined later could only control their own communication information outside. On the one hand, the Internet underlying protocol does not guarantee the security and arrival of information, which makes the Internet easy to become a hotbed of fraud and crime, which can only be protected by constructing firewall security measures. On the other hand, because the Internet operates based on simple underlying protocols and rich application layer protocols, it has high technical requirements for application developers. Only giants can develop platform level products, and most ordinary people can only become users of application products, which makes the platform oligarchs highly centrally control the content and data produced by the public and master everyone’s data privacy, and use these data to conduct various open or secret transactions and unilaterally make huge profits.

The most fundamental technological transition of Metaverse is the new underlying protocol based on blockchain technology. As blockchain is a distributed accounting technology derived from irreversible cryptography technology, it provides a more convenient threshold for public access and direct participation. The application of blockchain has once caused polarized judgment: Some people believe that the core value concept of “decentralization” of blockchain is a technical anti-control weapon to break institutional monopoly, which will bring more equality, higher efficiency and more freedom. The other part, as supporters of the existing authority and the existing order, is worried about “decentralization” challenging national sovereignty, disturbing social order and driving more underground economy. For example, the earliest known blockchain application is the cryptocurrency bitcoin. Since the initial concept was put forward in 2008, there has been no dispute, and it has experienced many ups and downs. In 2013, Ethereum created an ERC20 coinage mechanism, allowing everyone to issue coins freely, and a series of new digital currencies were born. Since these cryptocurrencies issued on the public chain of the blockchain do not correspond to the value production in the real-world economic system, they are considered to have a great speculative foam element. In addition, as a way of point-to-point trade settlement and cross-border payment, bitcoin is much more efficient than banks, and the route is uncontrollable, which makes the digital currency represented by bitcoin not only easy to become a tool for money laundering, but also destroy the national foreign exchange system and become a black technology severely suppressed by many governments.

However, it should be noted that only understanding blockchain technology as cryptocurrency or “decentralization” is a simplified and labeled misreading. At present, blockchain technology is developing with each passing day, and it is the core technology that all countries must compete for in the forefront. Leading the world, Chinese technical experts creatively put forward the technical route of “Internet+2”, and pointed out that there are two routes for the future Metaverse digital ecology: One is the application of “Internet + blockchain technology” based on the western mainstream technology platform, that is, using blockchain technology to improve and optimize the existing Internet technical architecture. One is to take blockchain as the core technology, instead of imagining the future on the Metaverse platform built by the existing western internet giants, but to build a brand-new inter chain network, build our own technical infrastructure and create our own ecological “Huaxia Metaverse”. Therefore, from the perspective of the forefront of blockchain Internet technology development, although there will be practical differences to some extent due to the ideological, national security, strategic deployment and other issues between the East and the west, this is a problem that can be solved by technology, and China has achieved fruitful cutting-edge achievements, which is also the techno-
logical creation mechanism of Metaverse economy.

3.2. Survival and creation mechanism: Digital twinning and digital primordial opening

Although the basic digital technology ecology has emerged, there are still disputes about the feasibility of the realization of Metaverse economy. One of the main doubts is that the existing energy structure of human society and human ability to use energy are not enough to support the creation imagination of the vast parallel universe in the high energy consumption stage of existing technology and computing power. However, if we start from the current living conditions of human society, we will find that the Metaverse economy is not only an imagination of the future, but also a way to deal with the crisis of human civilization. It is the active choice and planning of human survival in the existing challenges.

COVID-19 provides humans with an immersive scene of online life

The outbreak of COVID-19 provides a preview opportunity for the “Metaverse” type of digital economy. The home isolation, customs closure and international travel restrictions that have to be taken due to the epidemic have deepened the deep dependence of human society on online communication and virtual digital scene to some extent. During the epidemic in 2020, the users of a series of Internet applications such as online video conference, online office, online education, online fitness and online entertainment have increased explosively, and the valuation or market value of Internet enterprises has also increased. To some extent, these applications have made a preliminary attempt to transplant the actual needs of human society to the network in an all-round way, and are in the process of continuous updating, iteration and improvement due to the competition for users and the existence of competition as human beings live online longer and longer, and there are more and more value production modes that can “earn while playing” on the game platform like Roblox, the human survival mode is actually opening the kinetic energy transformation from having to adopt “online substitution” in the epidemic period to actively creating a “digital twin” lifestyle in the post epidemic period.

The post epidemic era calls for a new grand narrative

The global narrative is under further pressure in the lax prevention and control of the epidemic in Europe and America. Between the tear of the global economy and anti-global politics, and under the threat of computer intelligent algorithms, mankind needs a new future narrative, and digital Nativity provides mankind with a new narrative possibility. In a brief history of the future, Yuval Herali once said that compared with chimpanzees and other animals living in the living state of objective and subjective double reality, modern Homo sapiens is an animal living in three realities. In addition to the objective world and subjective feelings, Homo sapiens also has “fictional stories” about objective and subjective things, that is, narration. He believes that in the 21st century, with the help of new scientific and technological forces, the power of these fictional stories will be stronger. In the context that the old narrative consensus is constantly challenged, new technology will give more people the possibility of diversified self-narration. The globalization narrative started from economic globalization in the 1980s, whose underlying ideological support is the value orientation of liberal philosophy and individualism. Herali believes that in the 21st century, under the logic of liberalism, with the continuous improvement of production efficiency by science and technology. There will naturally be three development consequences based on “pragmatic” beliefs: “1) mankind will lose its economic and military use, so the economic and political system will no longer recognize that mankind has too much value; 2) the social system still believes that mankind as a whole has its value, but individuals have no value; 3) the social system still believes that some unique individuals have their value, but these people will be a super human elite, not the general public.” If we think these judgments are still a little abstract, we can see what kind of pseudo “justice” of an-
ti-intellectual and anti-elite position has been led by the huge division caused by the social gap between the rich and the poor behind Trump’s coming to power. We can also see the cruel story of money driven real-life fighting game under the wide gap between the rich and the poor in this year’s popular Korean TV series squid game Not only have severe social problems been covered in the existing system, but also in the current Internet system dominated by platform giants, the algorithmic logic dominated by platform interests has created a “prisoner’s dilemma” for ordinary people[4], not to mention that the platform uses public personal data for wanton profit-making and conscious manipulation. All these things that do not seem to be in line with the social interests take place in the highly modern social system in the West in a logical way .

In late December 2018, the economist published an article pointing out that most people in developed countries feel that today is not the same as before and are deeply trapped in an “omnipresent and sinister sense of decline”[5]. Therefore, the all-round difficulties in economy, politics and daily life caused by the numerous crises of liberal narration have been accumulated for a long time, and a new economic development paradigm and corresponding narration need to be constructed urgently. When talking about the future of “free order”, Liu commented: “If the ‘post human society’ really comes unexpectedly, many major political, economic and cultural problems facing the western liberal order are not solved, but may be completely cancelled or fundamentally changed”[6]. In this sense, the parallel universe, parallel society, and the “proliferation” of human digital twins, digital primitives and other identities pointed to by the concept of Metaverse are actually a transcendental solution to the solidification and value tearing of the current socio-economic class. Under the confused background of “mainstream narrative decline” of globalization, Metaverse unconsciously opened a new narrative about the possible diversification of human society in the future. It solves or replaces the problems in the existing dilemma by changing or adding a dimension, which in fact coincides with the psychological needs of the confused public. Especially with the rapid development of the robot industry, in the foreseeable future, more and more human jobs will be replaced by robots, and new jobs and social roles need to be created more urgently. In fact, the Metaverse economic narrative also indicates the potential socio-economic process of the expansion and transformation of human survival mode.

3.3. Economic creation mechanism: The new development of digital economy under the continuous innovation of digital technology

Since the new Internet economy, with the continuous breakthrough of digital technology on the established information barriers and resource boundaries in the original social structure, the continuous innovation of digital economy model has been produced, resulting in the continuous change of the internal law of digital economy. Metaverse seems to be a concept born out of nowhere, but if it is put into the historical development context of digital economy, we can better understand its internal gradual creation logic. Since the birth of the Internet and the formation of economies of scale, with the development of digital technology, the digital economy can be roughly divided into the following three stages.

**PC Internet economy leading stage (1990–2010)**

In the 1990s, with the rapid development of information technology in the United States, a series of social changes were caused, resulting in obvious changes in the economic situation of the United States. Since 1991, the United States has not only witnessed significant economic growth, the unemployment rate has decreased, the inflation of consumer goods has also decreased, and the periodicity of economic recession has been significantly weakened. At the end of 1996, an article in business week summarized this phenomenon as “new economy”, and believed that its main driving force came from the information technology revolution and the wave of economic globalization.
Leading stage of mobile Internet economy (2010–2020)

At the beginning of the 21st century, the release of iPhone 4 in 2010 started the wave of mobile Internet. In 2011, social software WeChat was released. Mobile smart phones and the additional social attributes of application software made almost everyone in the current society actively or passively involved in the digital economic network of mobile Internet. From consumer Internet to industrial Internet, all walks of life are undergoing various degrees of digital transformation, and an innovative and phenomenal economic focus will appear almost every year. For example, the sharing economy in 2017, the short video in 2018, and the e-commerce live broadcast in 2019. The continuous innovation of digital economy is changing the business structure and business model, as well as people’s lifestyle.

Metaverse economy opens (2021–)

Zhao, CO director of digital economy and digital transformation research center of Renmin University of China, put forward the concept of “Metaverse economics” for the first time in his book “Metaverse” published in August 2021, defining it as “all economic activities in the digital world, such as the creation, exchange and consumption of digital products”[7], and believes that the Metaverse economy is the most active and revolutionary part of the digital economy if in the stage of PC Internet and mobile Internet, the development of digital economy is more or less directly or indirectly related to the material production or services in the real world, then in the stage of “Metaverse” economy dominated by blockchain technology, when human beings enter the digital virtual world as a virtual avatar, their digital production and consumption can not only be separated from the real material production. Moreover, it will also present economic laws and value logic completely different from the production and consumption of the material world, for example, Roblox game platform provides the value exchange service of digital tokens and legal coins for those popular creators with high points, which shows the economic closed-loop system of creating value in the virtual world and then realizing value in the real world. On some blockchain based online game platforms, the “digital real estate” business of selling land in the digital world also appears. For example, on decentral and the sandbox, two well-known blockchain public chain platforms, the total number of land available for sale is artificially defined. Among them, Sandbox has demarcated 166,464 “lands”, and 60% of them have been sold. On decentral and, a piece of digital land of about 565.8 square meters was sold for $2.43 million on November 23, 2021. On the crypto voxels platform that can be used for incremental development, a piece of land called “9 robotics route” with an initial price of $101.2 is currently priced at $9,570.8. Why can you make money by playing games? Why can virtual “land” sell money and add value? This is because there is a new systematic economic logic behind it, so the Metaverse economy can also be called “new digital economy”.

4. Metaverse economy: The internal logic of a new type of digital economy

As an emerging concept, the diversified development forms of Metaverse will evolve with technological innovation and business practice. However, it is divided into a new digital economy different from the previous digital economy. The main logic comes from the birth of digital currency and the development of digital legal currency, as well as a series of new economic production and business models formed around digital assets. Under these two premises, the value theory system of traditional economy is also challenged and needs to be revised accordingly to promote industrial development.

4.1. Foundation layer: The tortuous development of digital currency and the role of infrastructure

Development of digital currency from “black technology” to legalization
The bottom of the new digital economy is the confirmation of the new monetary system, but this process is not achieved overnight. From its first appearance in 2008 to 2018, 10 years later, bitcoin has increased one million times and become the fastest-growing asset in human history. Although there are differences on the legitimacy of bitcoin in different countries, it cannot prevent the continuous development of this system without human service and government and bank guarantee. Millions and tens of millions of dollars of payments and transactions occur on the system every day. In 2013, Ethereum launched the blockchain cryptocurrency development mechanism based on smart contract technology, which has caused the proliferation of free issued ICOS (initial coin offering or initial crypto token offering), serious foam and widespread speculation.

Although the birth and development of a series of encrypted digital currencies represented by bitcoin are mixed, the currency transformation based on blockchain has become an irreversible trend. At the end of 2014, a report issued by the Bank of England reversed people’s initial negative perception of digital currency in an official capacity for the first time. This report points out that bitcoin has no credit risk and liquidity risk, and shows that this technology is the largest financial technology innovation in more than 300 years. In order to comply with this trend, the UK even launched the plan of digital sterling. Between 2015 and 2016, the Bank of England took the lead in proposing to develop a digital legal currency system based on blockchain. Therefore, 2015 is regarded as the “first year of blockchain” abroad. In December 2016, Guiyang city released the white paper “development and application of Guiyang blockchain”, which first put forward the concept of “sovereign blockchain”, and believed that blockchain can be used to safeguard national sovereignty. Through the smart contract on blockchain and combined with Chinese laws and regulations, every transaction can comply with Chinese laws, which is a very innovative formulation based on technology. In September 2017, Christina Lagarde, chairman of IMF fund, proposed to consider adding digital tokens to the IMF currency basket, which shocked the financial and academic circles. On August 23, 2019, mark Carney, the former governor of the Bank of England, delivered a speech in the United States, believing that the synthetic hegemony digital legal currency can replace the US dollar as the world reserve currency, which caused an uproar. This is considered to be an open challenge to the hegemony of the US dollar, which is known as the “823 event”. In response to the “823 incident”, Harvard University think tank believes that the next new currency war based on digital currency is gradually emerging, and calls on the United States to actively layout as soon as possible. In fact, in October 2020, the U.S. Department of Finance quickly began a series of major banking reforms to split existing banks, allow U.S. banks to issue stable currencies and participate in the blockchain network, and approve digital currency issuing companies to become special “banks” in the United States, which means that blockchain finance has officially entered the legal and compliant world financial stage.

Although China has banned the issuance and trading of bitcoin and other private digital currencies, the research and development process of the central bank’s digital legal currency has not been slack. As early as 2014, with the support of then President Zhou, the people’s Bank of China established a special research group on legal digital currency and defined the strategic goal of issuing digital currency. In November 2019, Fan, vice president of the people’s Bank of China, said that China’s legal digital currency has basically completed the top-level design, standard formulation, function research and development, joint commissioning and testing, etc. In April 2020, the central bank’s digital currency was tested in Shenzhen, Suzhou, Xiong’an New Area and Chengdu.

**Digital currency provides infrastructure for the new digital economy**

Since digital currency has many important functions and there has always been controversy
about the essence of digital currency, we are not going to discuss in detail the significance and role of digital currency for the whole economic system and the issuance criteria of digital currency. Here, we mainly want to point out that for the economic relations generated in the virtual world of the Metaverse, digital payment is still the foundation of the digital economy and an important infrastructure. However, the original network digital payment represented by WeChat and Alipay cannot spontaneously generate digital currency, which does not conform to the underlying logic supported by blockchain technology in the Metaverse, so a new derivative approach of digital payment is needed. Some scholars have proposed that digital legal currency will become the engine of the new digital economy.[12]

Although the monetary system based on blockchain technology and the global new financial system need to be further constructed in research and practice, digital currency—whether digital token or digital legal currency issued by the National Central Bank, despite different birth logic, is a new currency with warrant nature based on blockchain technology. In terms of underlying technology, the blockchain’s distributed accounting scheme can better ensure everyone’s value storage and value proof, and can clearly mark the ownership while completing the value storage function. Therefore, it can provide more accurate and convenient vouchers for the confirmation of personal property rights and the protection of intellectual property rights in the Metaverse at the same time, digital products created by individuals based on creative talent, talent and labor, once generated, can obtain unique digital warrants under blockchain technology, which naturally has asset attributes, which further encourages personal creation and makes it possible for everyone to create their own digital products in the Metaverse. These assets can be exchanged and circulated through recognition, and the diversified value they carry can be realized into economic value. This constitutes the driving force of economic growth at the bottom of the Metaverse economy, a variety of labor meanings and a new mode of economic production.

4.2. Business layer: The creation and consumption of digital assets reshape the business logic of the Metaverse economy

The definition of digital assets can be broadly classified, but digital assets in the Metaverse economy are mainly a kind of digital vouchers with economic value based on blockchain technology. Such vouchers can not only correspond to the mapping of real-world asset logic in the digital world, such as digital real estate, digital stocks, digital futures, etc., but also include digital rights and interests or digital works of art expressed by digital tokens.

At present, the most important embryonic form of Metaverse economy is still displayed and built on the new game platform. These game platforms with open source features are no longer the centralized design led by the platform creator, but the “co creation” digital space independently developed by players under certain tools and rules. The “players” on the game platform can be individuals, institutions or merchants. They can have diversified digital identities integrated by “digital identity” at the same time, buy or create their own “digital assets” on the game platform or other digital platforms, and complete the two-way exchange with economic assets in the real world in the new economic closed-loop system. This means that not only can all “businesses” existing in the real world be redone in the digital world of the Metaverse, but also can create services or experiences that are not in the real world and produce more value in the digital world.

Digital identity provides a new business model for the creation and consumption of digital assets

Digital identity is not a new concept, but with the development of times and technology, digital identity has different conceptual connotations and has experienced the evolution of centralized digital identity, federated digital identity and distributed...
Yuan and Yang

digital identity. Among them, the distributed digital identity is supported by the underlying technologies such as blockchain and distributed ledger, which has gradually expanded the identification attribute from people and things to data, which is of great significance in realizing the comprehensive interconnection of digital objects and privacy identity management, and has become the existence mode of digital identity in the Metaverse. An important function of distributed digital identity is that it can form identity migration between different platforms of Metaverse by virtue of private key, to integrate different digital avatars of the same subject on different platforms. This has an important impact on the formation of new business models in the Metaverse.

First, with NFT as the anchor point, the intellectual property rights of creators in the Metaverse will be better protected because of clear identity traceability NFT is the abbreviation of non-fungible token, which is translated into non homogenous pass in Chinese. Its biggest feature is indivisible and unique, it is precisely because of this natural scarcity attribute that NFT is sometimes directly regarded as a digital asset with asset attribute. In fact, NFT brings great convenience and accuracy to the ownership identification of digital works by building a set of contract mode, which is far beyond the signature, seal and stamp in the real world, and is difficult to be tampered with. Each NFT ID can only be owned by one owner, while one owner, that is, the owner of the same digital identity, can have multiple NFT ID. Therefore, distributed digital identity provides the basis for the integration of digital assets created and owned by avatars of different platforms in the Metaverse. In China, although NFT represented by cryptocurrency in a narrow sense is limited, some researchers have proposed NFR (non-fungible right), that is, non-homogenous equity[13], which provides a Chinese solution for the production and ownership of digital assets in the virtual world.

Second, the increasing popularity of digital identity provides a new way for commercial brands in the real world to market in the Metaverse digital world. Since the explosion of the concept of Metaverse, many brands have carried out product marketing and publicity on the Metaverse game platform. For example, vans built a skateboard park in Roblox, and users can buy vans’ virtual goods when playing games. Product brand marketing focuses on the avatar of human beings in the digital virtual world, which is called D2A (direct-to-avatar). Players can buy both physical products and virtual products in Metaverse games. If it is a physical product, D2A only involves the marketing method of a physical product. However, if the player buys the virtual product of vans skateboard shoes, it can also derive services for the wearing, cleaning and maintenance of virtual products in the game. For example, the application aglet can provide relevant services for the maintenance of virtual and real assets. At the same time, the product can also have a unique digital identity NFT. There are two business models: The purchase of real-world products and the purchase of virtual world products as digital assets. For example, Balmain, a French luxury brand, launched the latest series of sports shoes “BBold Doground” in cooperation with Doground, a high-end gym in the United States. At the same time, Balmain released NFTs versions of these two shoes on the global blockchain trading platform open sea, and provided its buyers with unique offline VIP experience services, including obtaining admission tickets to the Balmain show and quota to the backstage of the Balmain show. The physical products of the brand and the virtual digital assets realize the linkage in another sense. The invention and creation of these new business models are based on the digital identity of people as consumers and the confirmation of digital identity as unique products.

The two-way circulation of digital assets and real assets creates a new economic system

The new economic system constructed by the two-way circulation of digital assets and real assets is mainly reflected in two aspects.

On the one hand, the flow rate of payment and
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Transaction with digital currency is much faster than that of the old financial system, which improves economic efficiency and creates higher economic value. In May 2021, according to the data of CoinGecko, a world-famous encrypted data analysis platform, the total market value of cryptocurrency in the world was about US $2.55 trillion. According to the data released by the Federal Reserve Economic Database (FRED) in the same period, the circulation of US dollars was US $2.15 trillion, and the total market value of cryptocurrency has exceeded the circulation of US dollars. In 2020, the market value of global encrypted digital currency once reached US $3 trillion, surpassing the UK’s GDP of 2.71 trillion in 2020 and ranking the fifth largest economy in the world[14]. The rapid development of cryptocurrency has stimulated central banks to continuously promote the issuance of digital legal currency. The third global central bank digital currency (CBDC) survey of the bank for International Settlements (BIS) in 2020 shows that 86% of the 66 central banks around the world are studying the issue of digital currency, of which 10% are about to issue their own CBDC[15]. The circulation of digital currency can not only promote the improvement of economic efficiency in the real world, but also provide a feasible basis for the exchange of digital assets and real assets in line with the new monetary policy.

On the other hand, digital products created in the Metaverse digital world are generated into digital assets through consumption and purchase by others. Once the two-way exchange between digital assets in the Metaverse and assets in the real world reaches a certain scale, it means that the overall amount of economic production will be greatly improved. As an Internet game platform, Roblox first realized the two-way exchange between the platform digital token Robux and the US dollar, completed the economic closed loop, and became a mode of digital economic production on the game platform. The other mode is the direct transaction of various digital assets and physical assets on the blockchain game platform. For example, OpenSea is a trading platform for digital collections. Collectors trade real gold and silver for “digital collections” that do not exist in the real world. SuperRare is a special digital art trading platform based on blockchain. These new “Metaverse” economies existing in the virtual community on the chain have been continuously generating no small transactions. The creation, purchase and ownership of digital assets have become a new industrial form in the economic system. The emergence of these new economic transactions is not limited by the production laws of the physical world, which expands the overall volume of the human economy in a sense that cannot be fully estimated at present.

4.3. Theoretical level: Value theory in Metaverse economy

As an epoch-making transformation of the new digital economy, the production, circulation and consumption of the Metaverse economy have been completed in the digital world unprecedented. For human history, whether monetary system, economic system, regulatory system or legal system will be rewritten. In the currently initially visible Metaverse economic system, we can find that it is different from the laws assumed by traditional economics. At the same time, the development of Metaverse economic value theory will also release more creative kinetic energy and give birth to richer and diversified digital economy formats.

Deviation between Metaverse economy and traditional economic assumptions

The traditional economic theory system is based on the limited resources of the physical world and the subject hypothesis of Adam Smith’s rational economic man Huang and Zhu put forward the systematic discussion of “conceptual economics” at the summer forum of Netease economist annual meeting in 2014, and clearly put forward that the economics of production based on ideas challenges some basic laws of traditional economics. In their view, economics is a historical science, which needs to be innovated according to the evolution of economic structure, economic system and economic
form. When the economy of human society develops to the stage of taking ideas as resources rather than materials as resources, different economic laws will appear accordingly. If the current human society includes the production of material products, the production of pure conceptual products, and the production of both composite products, the Metaverse economy of pure product production, exchange and consumption in the digital world can be said to be the best representative of the conceptual economy.

However, it is biased to say that the concept economy is the whole connotation of the Metaverse economic law. The content production categories of many cultural industries, such as music, art, publishing and games, are actually the expression of the concept economy. Although Zhao et al. put forward Metaverse economics in their book “Metaverse” and believed that its characteristics broke through the basic assumptions of traditional economics and had unique laws that deviated from the traditional economy, such as increasing marginal benefits, decreasing marginal costs, recognition determines value, and zero transaction costs, they still failed to think about the breakthrough significance of the value production of Metaverse economy from the theoretical level. Since the Metaverse is still developing as a concept, the specific economic laws need to be summarized continuously, but returning to the most basic concept of “value” to rethink may bring enlightenment to the development of Metaverse economics.

The Metaverse economy provides the possibility for the realization of the value of the plural

The value theory of economics is usually traced back to the distinction between use value and exchange value in Adam Smith’s wealth of nations in 1776. On this basis, political economists in the 19th century put forward the value theory based on production cost, and later developed the labor value theory through Ricardo and Marx. Its main meaning is that the value of goods is determined by the amount of labor contained in goods. By the end of the 19th century, the economic behavior model based on personal utility replaced the value theory based on cost, which was regarded as the rise of “marginal revolution”. The British economist Jeffons further elaborated based on Jeremy Bentham, making “utility” the basis of marginal theory.

However, although the marginal utility theory has its significance in a specific historical stage, there have always been various criticisms, especially for cultural economists, such a demand assumption with a stable preference sequence is an absolute blindness to the social construction attribute of value identity. In order to make up for the deficiency of the value theory from the simple “utility” perspective, cultural economists and researchers of creative economics do not forget to include cultural value in the case study and assessment. Although cultural economists agree with postmodern theorists’ criticism of the too single economic values of modern society and agree that it is extremely necessary to reshape “an expanded, changing and mixed value interpretation”[16], they cannot find a general way to make standardized perception and digital evaluation of these expanded values (aesthetic value, spiritual value, social value, symbolic value, real value, etc.). Therefore, the emphasis or realization of expanded value often depends on certain consciousness, resulting in various uncertainties in practical practice. Once the economic situation is bad, the supremacy of economic value over cultural value becomes the norm, especially in the political and economic context of neoliberalism opened by Reagan Thatcher, the “value crisis” of cultural theory is an old saying.

If in the era of cultural economy, the development of value theory has indeed gone beyond the “utility” of standardized assumptions and has a just consensus of plural values, how to ensure that these plural values can be realized on a basis is still an unsolved problem. The law of conceptual economy is applicable in cultural economy or creative economy, but there is still a lack of technical guarantee to realize or prove these plural values useful (i.e. Economic value from the perspective of pragmatism). In the embryonic Metaverse economic sys-
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tem, the value demands expressed through experience are more diverse. At this time, “identity” becomes the intuitive basis for determining the value realization of digital products. However, as in the real world, will the “identity” in the Metaverse digital world be deliberately constructed or manipulated by advertising or marketing? In the future Metaverse, when human beings really take the coexistence of online and offline multiple separations as the norm, does the value identity of separations tend to be more consistent with reality or a compensatory “reverse identity”? Or is it a collection of identities that can have multiple values at the same time? These identification modes and characteristics of human value in the Metaverse will directly affect the value realization of digital products and digital creation in the Metaverse and the development logic of related industries. Under this new plural value logic, it will give birth to richer and diversified digital industry formats and greater prospects for economic growth.

5. Conclusions

At present, Metaverse is still in an embryonic form full of imagination. It is a hot topic discussed warmly in all walks of life. Therefore, it is particularly difficult to objectively discuss it. However, although the ultimate imagination of Metaverse survival has not yet been realized, the revolutionary and systematic underlying blockchain technology and Metaverse economic logic have taken root and are developing at a high speed in the future production and life form of mankind. As the Transformation Driven by this dimensional cosmic economy will push human civilization to the next generation Internet era, it intensifies the competition between countries.

This paper is entitled to move towards the Metaverse. First, it is to explain that the development of the Metaverse has the trend that should be generated in its era. The second is to express that in this dynamic development process, our awareness, understanding and even the comprehensive vision between history and the future will also determine our cognition of new opportunities and challenges, which will shape our common digital world in various ways. Instead of listing various specific processes of the development of the Metaverse today or predicting the future, the author tries to outline the mechanism, essence and even the core kinetic energy logic behind the relevant phenomena, changes and trends, hoping to sort out a preliminary and relatively objective overall cognitive framework for the discussion of the Metaverse in full swing, so as to attract jade for richer research in the future.

Conflict of interest

The authors declare no conflict of interest.

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