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An Assessment of Metaverse and NFT Taxation
Metaverse ve NFT Vergilendirilmesine İlişkin Bir Değerlendirme

Abstract

In the technology space, the most important topics discussed are related to the emergence of new digital assets such as the metaverse, NFTs, and artificial intelligence. In addition to the digital transformation of various corporate operations and systems and innovative approaches to asset creation, it is also important to address the economic and tax implications associated with these assets. The current uncertainty surrounding this rapidly developing technology is especially concerning considering its potential and momentum. Originally derived from online video games that prioritized user interaction, both the metaverse and NFTs now enable users to generate income and build wealth entirely in this digital environment. The comparison between NFTs and the metaverse serves to highlight the opportunity to develop a new field of decentralized solutions. However, the distinctions and commonalities between these two concepts are not sufficiently defined. A comprehensive understanding is crucial to establishing a solid foundation for NFTs and the metaverse. This study explores the definitions, characteristics, and differences between the metaverse and NFTs, while also providing recommendations regarding their tax implications based on implementations in various countries.

Öz

Teknoloji alanında tartışılan en önemli konular metaverse, NFT'ler ve yapay zekâ gibi yeni dijital varlıkların ortaya çıkmasıyla ilgilidir. Çeşitli kurumsal operasyonların ve sistemlerin dijital dönüşümü ve varlık yaratmaya yönelik yenilikçi yaklaşımların yanı sıra, bu varlıklarla ilişkili ekonomik ve vergisel etkileri ele almak da önemlidir. Bu hızla gelişen teknolojiyi çevreleyen mevcut belirsizlik, özellikle potansiyeli ve ivmesi düşünüldüğünde endişe vericidir. Başlangıçta kullanıcı etkileşimini önceliklendiren çevrimiçi video oyunlarından türetilen hem metaverse hem de NFT'ler artık kullanıcıların tamamen bu dijital ortamda gelir elde etmelerini ve servet oluşturmalarını sağlamaktadır. NFT'ler ve metaverse arasındaki karşılaştırma, merkezi olmayan çözümlerin yeni bir alanını geliştirme fırsatını vurgulamaya hizmet etmektedir. Ancak, bu iki kavram arasındaki ayrımlar ve ortak noktalar yeterince tanımlanmamıştır. NFT'ler ve metaverse için sağlam bir temel oluşturmak için kapsamlı bir anlayış çok önemlidir. Bu çalışma, metaverse ve NFT'ler arasındaki tanımları, özellikleri ve farklılıkları araştırırken, aynı zamanda çeşitli ülkelerdeki uygulamalara dayalı olarak vergisel etkileriyle ilgili öneriler sunmaktadır.

Keywords
Metaverse, NFT, Digital Transformation, Taxation

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Metaverse, NFT, Dijital Dönüşüm, Vergilendirilme.

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Introduction

The future trajectory of NFTs remains uncertain, despite the considerable discourse surrounding them. While there is a notable increase in the funds allocated to the NFT market, it is still in its nascent stages. Detractors of NFTs regard the substantial sums paid for certain NFTs as indicative of a potential speculative bubble, whereas proponents perceive this as a distinctive opportunity to revolutionize various sectors over the long term. A significant development currently garnering attention and increasingly linked to NFTs is the metaverse. This concept represents a vision embraced by prominent technology firms and can be cultivated through collaborations among the largest private enterprises, individual creators, and developers. The metaverse can be characterized as an immersive internet experience, wherein individuals feel a sense of presence within the environment rather than merely consuming content (Ustaoğlu et all., 2022: 1811-1812).

Facebook founder Mark Zuckerberg announced in October 2021 that they had changed the name of their company to Meta (Milmo, 2021). This change reveals a vision of building a Metaverse, or beyond concrete universes, rather than just replacing one title with another. If we look at the evolution of the internet in the last thirty years or so, first of all, in the web 1.0 period, html (hypertext markup language) and web pages written in this language (World Wide Web) began to be used. At this stage, each user could only read and watch the content published on the internet. In the web 2.0 period, each user could produce and publish their own content through social media applications such as Facebook, Twitter, Instagram, and they also had the opportunity to read and watch the content published by others. In the web 3.0 period, web pages were made smart by using machine learning and artificial intelligence techniques. In this period, personalized advertisements or content were prepared and brought to users (Hiremath and Kenchakkanavar, 2016: 707-708). In the Web 4.0 era, where the real and virtual worlds will be intertwined, web content can be read by machines, and humans and machines can communicate with each other through certain interfaces (Solanki and Dongaonkar, 2016: 77). In the Web 4.0 era, users will be able to buy and sell virtual assets, work in virtual offices, travel virtually, and in short, live in a virtual universe within the created virtual universe (Bloomberg, 2021).

The term Metaverse, first used in Neal Stephenson's 1992 novel "Snow Crash", which was translated into Turkish as "Parazit", defined a universe produced with the help of computing (Stephenson, 2016). The Merriam-Webster Dictionary states that the word "meta" in the term "Metaverse" refers to the idea of transcending reality, as in metaphysics, and a universe beyond the familiar concrete universe. In addition to a real and concrete life, the most important element that a virtual life promises to the user and could not achieve before is the elimination of boundaries in real and concrete life. In such a universe, the user will be able to become independent of time and space if he wishes, and will be able to take on the identity he wants and live the life he wishes. The user who enters a virtual life in the other universe can

design his counterpart (avatar) in the Metaverse in the form and power he wants, equip it with the clothes he wants, and obtain the securities or real estate values he wants. Such a life can be described as a desired, dreamed of, fascinating reality (Floridi, 2022: 2). However, all these actions in this universe will have a price. The said price will be paid via the block chain-based cryptocurrency called ETP. The Metaverse economic model is built on this currency (Gu et al., 2017: 9).

Numerous globally recognized brands have begun forming partnerships with the Meta Company to establish their presence in the Metaverse (Gibson, 2022). Through this collaboration, these brands will have the opportunity to integrate their virtual products with users' avatars within the virtual stores they will create in the Meta, offering products that are either NFT (Non-Fungible Token-Immutable Asset)-based or anonymous. NFT-based products are defined as items that embody the identity of their owners. Similar to a painting that possesses the characteristics of a work of art, these products bear the immutable signature of their creator and are singular in nature (O'Malley, 2022: 32). Given that the commercial activities within the Metaverse will rely on blockchain technology (Gu et al.,, 2017: 22), the ownership of any sold virtual product, or the attribution to the creator, will be permanently recorded on the blockchain. Consequently, even if ownership of the virtual product transfers, the original owner will remain documented on the blockchain, preventing any non-owner from asserting ownership. Likewise, an avatar that is not the actual creator of the work cannot claim credit for the creation for the same reason (Pinto-Gutiérrez et al., 2022: 1).

The process of applying for a patent is not only lengthy but also expensive. Nevertheless, the distinct characteristics of NFTs allow for a significantly expedited protection of intellectual property rights. In this framework, individuals seeking patent protection from the government will find that NFTs facilitate the safeguarding of their intellectual property rights throughout this procedure (Bamakan et al., 2022: 2).

The metaverse encompasses a synchronous environment in which individuals can collaborate and engage socially while enjoying recreational activities, presenting the possibility of evolving into a successor to the mobile internet. This platform may serve as a fusion of the social media networks familiar to us and a more immersive setting. Additionally, the growth of the metaverse is intricately linked to the proliferation of NFTs. An increase in user interactions across various platforms and blockchain marketplaces will facilitate the creation, sale, and purchase of NFTs by both users and developers. The rise of NFTs is perceived by some as a potential remedy for challenges that numerous companies encounter in both physical and virtual realms. In the tangible world, high-value items frequently face the threat of counterfeiting, with some high-quality replicas being distinguishable only to experts. Similarly, in virtual environments, it is feasible to produce "nearly" identical versions of digital products, often lacking any clear differences in the product files themselves (Pwc, 2021).

Nonetheless, NFTs possess the capability to leave a distinctive fingerprint on a blockchain, which can be verified by anyone at any time, thus offering a mechanism for

the identification and safeguarding of virtual property. This feature could enable owners to resell intellectual property while simultaneously enforcing licensed applications. However, the frameworks for enforcing these intellectual property rights have yet to be established. The programmability and traceability capabilities inherent in NFTs present opportunities to enhance the utilization of online identity and bolster personal data protection. By utilizing NFT-based online identities and smart contracts, individuals could achieve greater visibility and clearer distinctions concerning the ownership of their personal data. As a result, users would gain improved control over the dissemination of their data and may even receive compensation when their personal information is utilized or sold (Hocaoğlu and Habbal, 2022: 21-22).

Within the metaverse, individuals will have the capability to design distinct avatars or representations of their identities, each embodying various personalities. These avatars may be minted as NFTs, potentially transforming into commodities that can be traded across marketplaces. Subsequently, purchasers can utilize these avatars for branding and marketing initiatives or harness their influence to disseminate their messages to targeted audiences. As society progresses toward an increasingly digital future, the realization of the metaverse is anticipated to become imminent. Recent advancements in this domain, such as the rebranding of "Facebook" to "Meta" to explicitly highlight its commitment to developing the metaverse, alongside the filing of new trademarks for virtual Air Jordans within this space, underscore this trend. The evolving global landscape will facilitate the emergence of digital and highly integrated economies. Indeed, projections indicate that the global metaverse market size is poised to grow at a compound annual growth rate (CAGR) of 39.4% from 2022 to 2030, with the potential market opportunity exceeding $1 trillion in annual revenues. These developments raise numerous questions and concerns regarding the tax implications of transactions occurring in the virtual realm (Arora and Sharma, 2022).

The estimated size of the NFT market is projected to reach $471.90 billion by 2024, with an anticipated compound annual growth rate (CAGR) of 14.84% throughout the forecast period from 2024 to 2029, culminating in a value of $942.58 billion by 2029. Certain prominent NFTs are fetching prices in the millions. The NFT market exhibits significant segmentation and concentration, with the two predominant marketplaces, OpenSea and LookRare, responsible for nearly all monthly transaction volume associated with NFTs. As of 2022, the majority of NFTs are utilized for acquiring digital collectibles, including digital artworks and other representations of digital items. Additionally, there is a belief that NFTs will extend their application into various other domains, such as the representation of physical items (Busch, 2022: 13).

The aim of the study is to address the applicability of existing taxation principles to this new asset class in order to reveal how NFT and metaverse income is taxed. However, the primary goal is not to provide definitive answers, but rather to provide a framework for understanding the issues related to the taxation of NFT and metaverse income and to

highlight some areas for further analysis. Because there is no standard practice for the taxation of these incomes yet. The study first addresses the concept, scope and characteristics of NFT and Metaverse, and then the differences between these two concepts are revealed. Then, the taxability of metaverse and NFT incomes and taxation studies in different countries are revealed.

Conceptual Framework

The natural result of the digital world growing day by day and becoming dominant in every area of life and gaining acceptance is of course cryptocurrencies. The cryptocurrency world, where Nakamoto laid the foundations of Bitcoin in 2008, was met with interest by users and pioneered the launch of many altcoins such as Ethereum, Ripple and Tether (Çakıroğlu, 2022: 129). The years 2020 and 2021, when financial markets such as Ethereum, Ripple and Tether struggled with the Covid-19 pandemic and experienced extreme increases and decreases, prepared the ground for new investment instruments. Due to the uncertainties in the markets, stock exchanges in almost all of the global economy experienced historic declines, while oil prices fell below "0" dollars and started to be traded in the market with a negative value. In addition, the curfews frequently applied during this period also brought production to a standstill and caused extreme declines in oil and stocks. On the other hand, digital technology companies that came to the aid of humanity in the fight against the pandemic gained very high values. During this period, cryptocurrencies, which have existed since 2009 and have shown remarkable increases from time to time, have also begun to gain an important place. Although they are accepted only by a few states or regional administrations and are not officially recognized by central banks, cryptocurrencies have been met with great interest by individuals. So much so that new cryptocurrencies and exchanges are added every day, and transaction volumes have reached trillions of dollars (Euronews, 2022).

An important technology that cryptocurrencies that are accepted and easily used by individuals have added to our lives is NFT. NFTs, which are short for Non-Fungible Token, can be briefly defined as 'unique, unique and unchangeable' tokens. These tokens give a special code to any content produced in the digital world (photo, video, story, gif, picture, tweet, game character, etc.), making it unique and providing the opportunity for ownership. In a sense, it can be said that they provide ownership in our daily lives, like documents such as title deeds, licenses, etc. that show that any goods or products belong to us. The most distinctive feature that distinguishes NFTs from bitcoin or other cryptocurrencies is that they are unchangeable. NFTs answer questions such as which is the original of a digital content, who owns this original piece, which is the first product or version produced, and are frequently preferred by both individuals and artists. While individuals prefer them because they are a new collection item or investment tool, artists may prefer them because they are faster, easier and much more visible compared to the traditional art world. Because very few artists in the traditional art

world have the opportunity to exhibit their works in major auction houses or art galleries, and they have to pay almost half of their sales revenues to that gallery or auction house as a commission fee. In addition, it is much easier for collectors to transfer, store, preserve and exhibit digital works rather than physical works of art. Therefore, NFTs have started to attract a lot of attention due to their advantages in terms of both supply and demand (Kugler, 2021: 19-20).

NFTs made their entrance into our lives through the introduction of "The CryptoPunks," a project launched by the technology firm LarvaLabs in June 2017. The creation of CryptoPunks holds a significant position in the progression of NFTs. Specifically, CryptoPunks pertains to a collection of unique crypto images, comprising 10,000 tokens that carry a certificate of ownership recorded on the Ethereum blockchain. While the majority of CryptoPunks tokens depict male or female faces, there are also popular NFTs featuring zombie and alien figures (Kong and Lin, 2021).

Each token is designated by a unique number; notably, the token coded #7804 was sold for $7.5 million, which is equivalent to 4200 ETH, on March 11, 2021, marking one of the most significant sales in the history of NFTs. Following this transaction, the NFT titled Everydays-The First 5000 Days, created by the artist Beeple, was sold for $69 million, ushering in a new era. Amidst the heightened demand for NFTs and the soaring value of Ethereum utilized in their transactions, the CryptoPunks token coded #4156 was acquired for $10.25 million, equivalent to 2500 ETH. The token identified by the code #5822, which has achieved the highest sale value to date, was transacted for $23.8 million, amounting to 8,000 ETH. This remarkable phase has significantly heightened the demand for NFTs. While the market for these tokens has existed since 2017, the year 2021 has marked a pivotal moment for NFTs. The total value of revenues from NFT sales in the period up to 2021 was only $1 billion, but it rose to $10 billion in May following the rise that began in January 2021. In the following September, record-breaking sales increased by more than 100 times compared to the previous year, generating a total revenue of more than $116 billion. Although revenues fluctuated in the following months and fell to $45 billion in December 2021, revenues exceeded $80 billion in February 2022. While the average number of NFTs produced until 2021 was 5 million, this number reached 13 million in June 2021, 47 million in July, 129 million in August and 136 million in September. September is the peak month in terms of both production number and sales revenue. Although the number of production decreased to 15 million in the following December, over 42 million NFTs were supplied as of February 2022 (Gazioğlu & Özen, 2022: 24-26).

NFT technology is attracting great interest from individuals. However, there are still discussions about whether NFTs will be the art of the future, an investment tool, or a short-term fad. But these tokens, which are one of the most popular technologies of recent times,

are today's reality. In this context, it would be appropriate to examine the working principle of NFT's technological components and the methods of buying and selling (Kang, 2025: 34).

NFT Concept and Scope

The idea of NFTs was born in 2012-2013 from the "colored coins" that were tokens on the blockchain. These tokens functioned to represent real-world assets within the blockchain. One of the most basic functions of NFTs is that they express ownership of a certain asset. In addition, although the technology was not sufficiently developed at that time, tokens made it possible to create the necessary foundations for future applications and uses. Although some successful NFTs had emerged before, the first major NFT project was launched on the Ethereum network in June 2017 by Canadians John Watkinson and Matt Hall, developed at a studio called Larva Labs called CryptoPunks (Temür, 2024: 31).

NFTs are entirely reliant on a technology referred to as blockchain, which functions as a digital ledger. This system is employed to record cryptocurrency transactions and establishes a peer-to-peer network among numerous computers necessary for maintaining transaction information. In essence, NFTs are associated with cryptocurrencies that utilize blockchain technology. The defining characteristic of NFTs is their immutability, signifying that they are unique items that cannot be exchanged for one another. Representing a digital asset, each NFT is owned by a single individual who has purchased it. The primary content of NFTs includes artwork and music, although they may also encompass brief tweets and videos. For instance, when an NFT representing a renowned artwork or painting is sold to an individual, it does not imply that the actual painting has been transferred; rather, the buyer receives a certificate of ownership that is recorded on the blockchain. NFTs can be bought and sold on specialized online platforms known as NFT marketplaces. Payments are made using various cryptocurrencies, and access to securely stored cryptocurrency is facilitated by a free internet browser extension called Metamask (Arora and Sharma, 2022).

Key NFT Features

NFTs are produced, marketed and can be bought and sold with a number of technological components. In this context, technologies such as blockchain technology and smart contracts are behind the presence and trading of NFTs in the market (Okatan, 2023: 77).

Block Chain is the advent of block chain technology in 2008, marked by the introduction of Bitcoin—the inaugural cryptocurrency—represents a sophisticated method of data storage. This technology provides a database service that is both highly secure and reliable, finding applications across various sectors, with a primary focus on finance. Indeed, block chain technology is fundamental to the operation of cryptocurrencies. It refers to a digital recording

system that functions as a global transaction ledger for crypto assets, where the virtual currencies generated within the system are documented. Consequently, this process facilitates the creation of virtual money. The term "bitcoin" derives from the structure of this system, which comprises digital information blocks organized in a block chain format, and is named after the bit (byte) system, the smallest unit of data in computing (Şanlısoy and Çiloğlu, 2021: 52).

Briefly, if we need to define the blockchain technically, it can be expressed as 'distributed, encrypted, unchangeable and incorruptible data storage'. This technology stores all the transactions made between users in the system over the network after verifying them. In this technology, where transactions are kept as blocks and connected to each other to form a chain, blocks are created and recorded in the system according to predetermined rules. After the created blocks are added to all distributed ledgers, the summary of the previous block is taken while creating a new block, then the second block is connected to the previous block. This situation is repeated for each block produced and the blocks are connected to each other in a chain. When a transaction is performed on the system, the block is created after it is published over the network and verified with cryptographic algorithms. Each user in the system represents a node, and each node has its own ledger, which we can call a database or blockchain. It is possible to match these ledgers owned by the nodes representing each user with each other in a decentralized way through an end-to-end protocol. In the event that a node is damaged or disappears, other nodes can preserve all transaction details (Ünal and Uluyol, 2020): 168).

There are some standards and criteria when creating a blockchain. In the distributed criterion, which is one of these and can be considered as an important criterion for the blockchain, data is not kept in just one place and is stored in a way that is ready for distribution. Another important criterion is transparency, which means that every data recorded in the blockchain is transparent and verifiable for each node. This criterion forms the basis of the reliability of blockchain technology. The independence criterion is the most distinctive feature of blockchain technology. As a matter of fact, in blockchain technology, each node in the system can transfer its data through the consensus (contract) structure without the need for a central authority. Another feature, immutability, refers to the fact that the data recorded in the chain can be stored in a way that cannot be changed, updated or deleted in any way except for attacks on the system. In addition, the privacy feature also refers to the fact that the nodes in the chain can transfer data without having to declare their identity in any way. In fact, it is not necessary to know the identity of the person to transfer data, it is sufficient to know only the blockchain address of that node (Ünal and Uluyol, 2020: 168-169).

Smart Contract means NFTs are created using Ethereum blockchain technology. The Ethereum blockchain is an open blockchain type and is a completely independent and decentralized blockchain where anyone can join the network. Created to create and use decentralized and highly secure applications, Ethereum transactions are made using the system's own cryptocurrency called ETHER through smart contracts. NFT is a type of cryptocurrency

derived from Ethereum with smart contracts (Smart Contracts). Founded by Vitalik Buterin in 2013 with the motivation that the blockchain concept can be used for more than just money, Ethereum's difference from Bitcoin is that tokens produced on its own network are produced with a smart contract that allows programmatic calculations that support all calculation methods. In fact, Buterin defined these smart contracts as systems that automatically move digital assets according to predetermined optional rules (Valeonti et al., 2021: 4).

The foundation of smart contracts actually goes back to 1994. Szabo came up with this idea to accelerate, execute, verify and increase the sense of trust sought in contracts in a digital environment. In the simplest terms, a smart contract is a technology that automatically runs transactions between parties and includes them in the blockchain without the need for any central authority or human intervention. Although there are many blockchains that work with smart contracts today, Ethereum is the most widely used of them. Smart contracts, which are the most basic and important feature that differentiates it from Bitcoin as a blockchain, allow not only bilateral but also multilateral transactions to be carried out on the Ethereum network and produce cryptocurrency tokens or NFTs. In short, it is not possible to create a smart contract in Bitcoin, the most popular cryptocurrency. One of the main motivations for the emergence of the Ethereum blockchain is the permission to program a code. With this permission given to create code, in addition to cryptocurrency transfer transactions like in the Bitcoin blockchain, the opportunity to produce new applications such as NFT Tokens or cryptocurrencies has arisen. With its decentralized autonomous structure, the smart contract, which performs fast and reliable transactions without the need for any authority or human intervention, has attracted considerable attention. The interest and demand for decentralized finance applications, called DeFi and abbreviated as Decentralized Finance, is an indicator of confidence in the future and potential of smart contracts. In short, smart contracts are applications that operate with data on the blockchain, a database of distributed ledgers (Tevetoğlu, 2021: 201).

Address and transactions means are the most basic concepts of cryptocurrencies on the blockchain. An address on a blockchain is a unique identity complement given to each user for the purchase and transfer of assets. It can be compared to a bank account in the traditional financial sector. This address contains alphanumeric characters generated via a private and public key. For NFT transfers, the address owner must prove that he/she has the relevant private key and send the assets to another address or addresses with a correct digital signature. This transaction is usually carried out with a cryptocurrency wallet (Valeonti et al., 2021: 4-5).

ERC-721 Standard; ERC-721 is a smart contract that enables the production of NFTs over the Ethereum network. In other words, each token produced in ERC-721 is a unique and unchangeable token. The ERC-721 standard is the interface that every smart contract that produces NFTs must implement. Although the tokens produced with this contract have applicability in many areas on Ethereum, they have been applied especially in the fields of gaming, virtual real estate and collections. ERC-1155 allows both NFT and other tokens to

be produced in the same contract. This contract is very useful for players who want to create a more advanced in-game economy (Musan et al., 2020: 12-14).

Metaverse Concept and Scope

The metaverse, which means virtual universe, fictional universe or beyond the universe, is a multi-user and real-time virtual space, an alternative world, where individuals from different locations can live, socialize and shop by connecting through a network (Akkuş et al., 2022: 23). Businesses now operate in virtual environments. The metaverse, which offers this virtual environment to individuals and organizations in many areas such as culture, art, education and economy, also contains some concerns. There is a risk of fraud due to the inadequacy of legal regulations, limited supervision, being a new medium and people creating content aimed at making profit. After Web 1.0, where a person only uses the internet, and Web 2.0, where they produce content in addition to using it, the metaverse is a representative of Web 3.0, where the real and virtual universes are intertwined and the Web becomes a living space (Özkahveci et al., 2022: 401).

The development of a virtual universe in a macro perspective consists of three stages. These are digital twins, digital personalities and surreal stages. In the first stage, users' emotions and movements are imitated in activities in a virtual world that is an exact copy of reality. In the second stage, avatars created in the digital world can now produce innovations and predictions that can only exist in virtual spaces. The increasing content in the virtual world also has the ability to transform and renew the production process of the physical world, and intersections are formed between the two worlds. In the last stage, the metaverse reaches the ability to sustain itself. As the intersection points increase, this integration will now present a surreal integrity for the two worlds. Thanks to the wider content range of the virtual world than the physical world, this world will cover the physical one, and some activities will only occur there (Wang et al., 2022: 3).

Key Metaverse Features

The four basic features that are considered as the basic components of the metaverse are (Dionisio et al., 2013: 2):

- Realism which means a virtual space created should be realistic enough to make users feel as if they have moved into a new area, both psychologically and emotionally.
- Easy accessibility which means accessible from all available digital devices (computer, tablet, mobile phone, etc.) and virtual identities (collective personalities) should remain intact throughout the duration of use in the space.

- Having substitute assets which means used to ensure that digital assets used in creating or restructuring the environment in the virtual space can replace each other in different applications without interrupting the user experience.
- Scalability which means a server architecture in the virtual environment must be able to provide enough power to accommodate a large number of users without compromising system efficiency and user experience.

However, virtual spaces that have these features are considered as metaverse universes.

Metaverse Tools

Augmented Reality makes some virtual additions to the real world, spatially combining the two worlds. With technological tools such as smartphones, tablets, glasses, and contact lenses, the real world is the sub-layer and moving virtual images (for example, a dinosaur walking on the street) are placed on it. Virtual Reality is an abbreviation for virtual reality. It is a digitally created, alternative artificial environment. Users feel like they are in a completely different world and interact with the physical environment there as if they were in the real world. With the help of special sensor equipment such as virtual reality glasses, headsets, and multi-directional treadmills, this experience is strengthened in terms of vision, hearing, touch, movement and interaction (Mystakidis, 2022: 486).

Blockchain is a digital database containing encrypted, unchangeable data. The recording, approval, storage, maintenance and transmission of data are carried out in a chain created on the network by multiple computers and servers working together in communication. The accuracy of a transaction in the chain is confirmed by other computers selected from those who are not parties to the transaction (Özay and Mirgen, 2021: 51). The main motivations for integrating blockchain technology into the metaverse are to ensure data confidentiality, security, quality, seamless and secure sharing, interoperability and integrity, to ensure that the financial system and smart contracts operate in a secure environment, and to pave the way for the use of NFT certificates (Huynh-The et al., 2023: 402).

Crypto Assets are decentralized digital money (asset) types used on the internet. They are defined in digital wallets through passwords. They are not subject to the procedures, controls and guarantees of central banks (Eren, et al., 2020: 1362). Since these assets are seen as a means of exchange, their prices tend to be volatile. Since they do not have a physical existence, they can be divided. The user's identity information is anonymous and kept secret. All commercial transactions in the Metaverse are carried out through crypto assets that are suitable for the structure of that universe (Karaçalı, 2019: 21-22).

NFT is a crypto asset derived from the Ethereum smart contract and cannot be imitated because each has a different structure. When it is defined for any digital object, it indicates that it is unique and gives its ownership to a single person. A digital asset with NFT is now certified and one of a kind (Kabak and Kırbaş, 2022: 318).

Comparison of NFT and Metaverse

In recent years, NFTs have surged in popularity as a means for creators to market their work while establishing authenticity and ownership within the digital realm. Although the Metaverse is still in its nascent stages of development, it possesses the capacity to transform interactions between individuals and digital content. This virtual environment, characterized by a 3D space rendered in real time, is facilitated by an interoperable network. The Metaverse is recognized as a shared online world where multiple users can engage, socialize, and participate in various activities. It represents one of the most prominent forms of contemporary virtual reality (Yadav, 2024).

While the internet may appear to be a straightforward system due to its widespread availability and accessibility, it is, in fact, quite intricate. The term NFT stands for non-fungible token, which is recognized as a unit that is immutable. These tokens are transacted using the necessary cryptocurrency, encompassing digital items such as music, videos, gifs, virtual avatar accessories, among others. Numerous platforms facilitate these purchases. The primary distinction between NFTs and the metaverse lies in the nature of NFTs as unique virtual tokens that lack alternatives, whereas the metaverse represents a concept of a virtual realm where individuals can acquire NFTs of various digital items. An overview of NFT vs. metaverse comparisons shows that they are completely different entities. Much of the confusion surrounding their similarities revolves around the fact that both have close ties to decentralization. NFTs are changing the way we perceive asset ownership in the real and virtual worlds. The metaverse, on the other hand, is also transforming the way we perceive and use the internet (Ambolıs, 2023).

Taxation of NFTs and Metaverse

To begin with the taxation of NFTs; NFT sector, which has reached billions of dollars in volume and users from all over the world, has attracted the attention of governments, as in cryptocurrencies. NFTs, which are a relatively new concept for the market, are in a similar position in terms of public administrations. While official institutions have tried to introduce legal regulations defining cryptocurrencies primarily due to the intense interest they have received from users, a similar situation is happening for NFTs today. Indeed, while legal regulations for cryptocurrencies are extremely limited in many countries of the world, the United States has pioneered tax regulations for NFTs, which differ from cryptocurrencies with their unique features. For example, the Internal Revenue Service (IRS) introduced a legal regulation in November 2021, and within this scope, it has been made mandatory to declare any profits made from transactions made in the context of buying and selling NFTs (Kugelman, 2025). Although this regulation could not provide clear guidance on the taxation of NFTs due to

technical issues, it was required that each cryptocurrency transaction of $10,000 or more be reported to the IRS (Will, 2021).

The IRS categorizes cryptocurrencies as stocks and classifies NFTs as collectibles, establishing distinct tax regulations and rates for each. Due to the novelty of NFTs within the realm of tax legislation, ambiguity surrounds their specific classification. Numerous experts liken NFTs to jewelry, antiques, or works of art, asserting that they ought to be taxed as collectibles. Should NFTs be classified as collectibles, they will incur a flat tax rate, which, in the United States, is higher compared to the rates applied to cryptocurrencies viewed as stocks. For instance, long-term capital gains from cryptocurrencies are taxed at a rate of 20%, whereas the corresponding rate for NFTs stands at 28%. Investments in NFTs, characterized as short-term and held for less than 12 months, face a tax rate of 37% (Valbrun, 2022).

As a result of this regulation introduced by the IRS regarding NFTs, the most important issue that NFT producers need to decide is whether these people will perform NFT production as a hobby or a professional profession. Because although NFT production does not cause tax consequences in itself, whether the transaction is made as a hobby or commercially is of vital importance for taxation. On the other hand, what NFT buyers should pay attention to is the fact that not only NFT sales but also NFT purchases will be subject to tax. In fact, since the IRS considers cryptocurrencies as assets and NFTs are bought and sold with cryptocurrencies, they are considered taxable transactions (Varemchuk, 2022). As a result, while NFT production is not subject to tax; buying and selling NFTs with cryptocurrencies or exchanging NFTs for NFTs will be subject to tax.

According to the IRS regulation, we can explain the taxation issue in a few scenarios. One of these is how taxation may be for NFT investors. For example, let's say an investor bought an NFT for 50 ETh when Ethereum was worth $4,000. However, let's assume that this person bought these Ethereums, which are currently worth $4,000, for $1,000 in the past. In this case, due to the increase in value in ETH (200,000-50,000), a taxable capital gain of $150,000 would be obtained. Again, let's say the same investor bought another NFT for 3 ETH when Eth was $4,000. If he sells this NFT for 4 ETH while the unit value of Ethereum is $ 4,500, with a simple calculation (3*4=12000, 4*4,500=18000, 18000-12000), he will have gained a taxable profit of $ 6,000. When we consider the issue from the perspective of the NFT producer, if this producer makes a living by constantly producing NFTs, the profit he makes from this NFT sold to the above-mentioned investor will be subject to tax as self-employment income (Teller and McClure, 2025).

Although no detailed document or text has been published, the taxation of NFTs in the United Kingdom, like the United States, is considered a capital gains tax. However, although many countries do not have a clear provision covering NFTs in their tax legislation and no definition in this tax fully covers NFTs, country practices are carried out according to income tax. However, as in Singapore, if NFT purchase and sale transactions are carried out by a company, they are subject to corporate tax (Cheong, 2022).

This segment of the study clearly indicates that research concerning tax and legal regulations pertaining to NFTs is relatively nascent, revealing that this concept remains largely unfamiliar to the tax laws of various states. Consequently, there is currently no existing legal framework that provides a detailed definition of NFTs. It can be asserted that investigations into legal regulation and taxation of NFTs are still in their infancy. Conversely, it is reasonable to suggest that, particularly in developed nations such as the USA, comprehensive tax legislation addressing this matter may be established within the forthcoming years (Avcı, 2023: 652-653).

Although the metadata and NFT economy is rapidly growing, how the metaverse and NFTs will be regulated remains uncertain. Concerns surrounding the regulation of many issues, including how this new economy will be taxed, are becoming increasingly evident. But where there is money, there will eventually be taxes, and only governments can design the necessary governance framework. Tax authorities often lag behind private institutions in terms of technological development. Like many of us, tax authorities do not fully understand how metadata or NFTs work and are slow to attempt to regulate or tax this economy. While there is some guidance from tax authorities on how to tax cryptocurrencies, there is less guidance on how to tax NFTs or other metadata-related activities (Owens and Costa, 2022).

The OECD has introduced various policy recommendations, beginning with the Base Erosion Profit Shifting (BEPS) initiative concerning virtual and digital assets in 2013, and progressing to more targeted proposals for a digital services tax in its most recent 2018 report on the digital economy. Through Pillar One of the BEPS action plan, the OECD has made considerable strides in modifying the international income tax framework to accommodate emerging business models by revising the rules governing profit allocation and nexus related to business profits, while also establishing a new taxation system. The objective of Pillar One is to enhance the taxation rights of market jurisdictions where businesses actively and continuously engage in the local economy. However, it remains uncertain whether an international corporation can navigate all potential tax ramifications that may arise from managing its own metadata or interacting with other metadata and businesses in the physical realm. Such a scenario would lead to increased complexity and complicate the identification of the source state or market jurisdiction. Additional challenges stem from the current absence of a coherent and coordinated characterization of NFTs. An additional challenge arises from the fact that NFTs predominantly facilitate transactions involving metadata and exchangeable assets, which may be issued through both cryptocurrencies and traditional currencies. Furthermore, there exists a significant risk of conflict regarding the interpretation of double tax treaties related to income generated from NFTs (Temür, 2024: 35).

As of the end of 2021, there are no countries that have legal regulations on crypto assets except for the USA, Russia, European countries, Japan, India, Australia, New Zealand, Argentina and a few other countries (Buchholz, 2022). In some of these countries, crypto assets are subject to tax. The use of crypto assets as a means of payment is restricted in our

country. NFTs, which are a digital publication format, have not yet been defined. Therefore, there is no taxation on digital platforms (Şahin and Çiftçi, 2022: 680).

Since there is no taxation process, the only thing left for businesses is to track their own activity results and inform their current and potential investors. Just as businesses collect all of their financial transactions in the physical world under the umbrella of accounting, it is also necessary to record the profits obtained from their activities in the virtual world, at least in terms of tracking the income and expenses of the business and making profit planning. Although the taxation status in this area is currently debatable, it would be right to think that states will not leave this area uncontrolled for a long time. Therefore, just like in the physical world, there will be a need to account for these activities and tax the profits. From that moment on, accounting information will definitely be needed in the metaverse (Temür, 2024: 39).

The metaverse is always presenting ways to make desirable income, earn rewards, and have transactions. So, at least in theory, such income should be taxed on it. But this statement, of course, brings about more practical questions like if metaverse taxation is possible and if so, whether it is worth the trouble. Yes, there are many issues that stand with sovereignty, sustainability, liquidation, valuation, and convertibility. There are all sorts of activities in the metaverse that generate income: users earn rewards or prizes in competitions; they have a job which comes with pay or a salary; or they run a business that gives them commercial profits. They create virtual assets, collect loots or acquire them, and sell them for profit through trading property. The very first step in taxing such income would be finding out the tax base because usually it is hard to track down income in a virtual setting. To set up the tax base for income and profit made in the metaverse, general rules of income tax apply. As per these rules, the tax base is net income of the taxpayer, which is gross income less any operating expenses or costs. In cases pertaining to income and profit made within the metaverse, the mode of payment does not affect its addition to gross income (Kim, 2023: 7).

The ability of participants to engage in the spending and earning of in-game currency, along with other digital assets that have real economic value—such as selling valuable virtual property or land—qualifies the profits earned from these transactions as income. Also, a sovereign state that has the right to charge taxes on economic activities done outside the Metaverse will have the same right to levy taxes on similar activities taking place within the digital world. Most countries like to exercise this automatic right of taxation through the income principle. Therefore, a sovereign state should, in principle, tax any profits arising from such activities. If a company chooses to make its own NFTs and sell them within a metadata environment—for instance, a fashion label offering exclusive branded avatar clothing—any profits that result from the increase in value of the NFT can also be taxed in the cryptocurrencies received by the company in exchange. To sum up, economic activities carried out in the Metaverse and the income generated from they are entitled to taxation, whether or

not they originate in a closed loop. Otherwise, new and different tax havens will commence sprouting (Berg and Stipdonk, 2022).

The problems that come with earning money in the Metaverse are not very big. But, since this money is seen as digital assets or cryptocurrencies, it brings two major issues. First is valuation; the ups and downs of digital assets make it hard to trust any figure related to Metaverse earnings. The second issue is liquidity; people will probably face cash flow problems when paying taxes if their virtual money exists only as assets and not as real cash. One possible fix for both issues could be to delay the tax on that income until these digital assets turn into cash. Also, taxing the Metaverse can incorporate a regulatory check by improving information reporting and transparency in the financial markets related to the virtual economy. Over the years, regulation in such markets, especially those of cryptocurrencies, NFTs, and other Blockchain innovations closely tied to the Metaverse, has become indispensable (Akyüz and Gülten, 2024: 293-294).

NFT taxation depends on your country of residence and your role as creator, seller, or buyer of NFTs. In most jurisdictions, NFTs fall under capital gains taxes. For sellers, where applicable, NFT taxes mean you owe tax on profits from selling an NFT. If you are an artist or creator, income tax rules will probably apply since tax authorities could consider profits from NFT sales as income. Also, the exact nature of what is sold as an NFT matters. Generally, NFTs are sales of services, so they fall under the rules for electronically supplied services. However, these rules get influenced by the place of supply to the customer, the commission payable to the seller, and the fees borne by the customer. For buyers, acquiring NFTs with fiat currency does not result in a tax liability, though taxes must be paid on any purchases made using cryptocurrency. The reason is that buy, sell, gift or exchange of cryptocurrency is classified as a divestiture denoting disposal of an asset and any profit thereon is subject to capital gains tax (Kim, 2023: 8).

While most countries have published tax guidance on cryptocurrencies, this is not the case for NFTs. For example, NFT tax guidance is available for New Zealand, but not for Australia, Singapore, the UK, and the US, to name a few. In some countries, NFTs are subject to the same tax rules as cryptocurrencies, and in others, NFTs themselves are misdefined (Pwc, 2022: 18-19).

Taxation of Metaverse and NFTs in Some Countries

Here are some examples of how some countries tax the Metaverse and NFTs (Anderson, 2025):

Ireland

Ireland does not have separate rules for NFT taxation. Cryptocurrencies are treated as assets and subjected to capital gains tax under Irish taxation. Since NFTs are also classified as crypto assets, they fall under the same tax treatment as cryptocurrencies. Tax liabilities occur when crypto is used for purchasing goods and services as well as on receiving crypto and NFTs as a gift. In such cases, the liability is toward Capital Acquisition Tax (CAT). However, ambiguity exists in the taxation of NFTs received through airdrops. Generally, Irish law grants VAT exemption for cryptocurrency, subject to certain terms and conditions (Mclure, 2024).

India

In early 2022, India announced the enforcement of a 30% tax on all gains arising from the transfer of any virtual digital asset which also includes metaverse assets, cryptocurrencies, and NFTs. This tax shall be applicable to all income earned from the transfer of virtual digital assets, whether it is classified as business income or investment income, and irrespective of the duration of holding the asset. Even those receiving NFTs and cryptocurrencies as a gift will have to pay the 30% tax. This taxation will be imposed from the fiscal year 2023-2024. These assets will also be liable for a 1% source tax deduction July 1, 2022. What should be highlighted here is that this source tax deduction applies only to the final sale amount of the NFT and nothing else in terms of profit or loss. Nonetheless, following the amendment to the Income Tax Act of the country in April 2022, certain NFTs are excluded from the tax imposed on the transfer of virtual digital assets. Specifically, NFTs that "result in the transfer of ownership of the underlying tangible asset" are not classified as virtual digital assets for taxation. In summary, when an NFT is associated with a tangible asset, such as real estate, it is not regarded as a virtual digital asset by India (Arora and Kaur, 2024: 40-41).

Singapore

Singapore's taxation of NFTs (non-fungible tokens) operates under the broader digital asset policies of the country. The tax treatment of NFT transactions depends on whether they qualify as commercial activities (IRAS, 2020: 5). The Singapore Income Tax Act applies to NFT income that people earn through commercial activities because it classifies this income as trade income (IRAS, 2020: 7). The regular purchase and sale of NFTs along with NFT minting operations qualify as commercial activities. The Singapore tax laws do not apply to NFT buying and selling activities conducted for personal or hobby purposes because these activities generate capital gains that remain tax-free (Pwc, 2022: 83).

Canada

Since Canada does not have specific tax laws on NFTs, it is advisable to follow the country's general taxation rules on cryptocurrencies. As a rule, activities like creation and sale of NFTs for commercial gain, buying and selling of NFTs for profit, and even promoting a product or service and executing recurring transactions fall under business income tax. If you do not own a cryptocurrency business or engage in day trading, it is likely that your NFTs will be taxed as investment income. Also, capital gains taxes apply to 50% of the realized profits from the sales of NFTs which usually relates to people buying and selling NFTs. Without specific regulations for NFT taxation, the Canada Revenue Agency (CRA) applies taxes on a per-person basis (Ghaith, 2022: 6).

UK

Like many countries, the UK does not yet have separate legislation relating to NFT taxes. However, HMRC has issued tax guidelines for cryptocurrencies and has classified NFTs as a separate asset class from cryptocurrencies. Based on this development, it would be sensible to say that profits and losses from transactions involving NFTs will be subjected to capital gains tax. Essentially, this means that if NFTs are sold at a profit, capital gains tax will apply at different rates depending on the length of time the seller held the asset. In other words, income tax liabilities will attach to the creation and sale of NFTs. Also, HMRC considers trading and gifting NFTs as disposal of an asset; hence, these activities are also taxable (Wimmer, 2025).

EU

The European Union is working on plans to ensure the proper taxation of crypto assets by its member states. Last December, the European Commission introduced new tax rules aimed at cutting off cryptocurrency tax fraud and evasion (Pinkse et al., 2022: 3). If passed, the law will require all digital asset service providers to report any transactions related to crypto assets for EU residents to their national tax authorities. These rules will also apply to stable coins, NFTs, and other digital assets. "The proposed legislation will require reporting of income earned through investments in crypto assets and the exchange of such information which will help Member States to get a full set of information to collect the tax revenues due." (OECD, 2025).

USA

In October 2022, the Internal Revenue Service or IRS, which is the tax collection agency for the United States of America, updated its tax codes to include NFTs. The updated Draft Tax Guidelines moved the classification of assets from virtual currency to digital assets and specifically included stable coins and NFTs. But huge ambiguity still remains about how to

classify NFTs whether as "collectibles" or as "commodities." Only tangible personal property qualifies as collectibles IRC Section 408(m) (2). A proposed crypto bill 2022 on the other hand wants to classify NFTs as commodities so they would fall under the purview of the Commodity Futures Trading Commission CFTC. Thus every transaction involved in buying an NFT using cryptocurrency, selling an NFT, or exchanging one NFT for another will be a capital gains taxable event. Also, gifting NFTs taxed applies if the value is over $100. Capital gains tax is applicable on the profit realized from the sale of any asset which appreciates in value during the period of ownership. The IRS has maintained that every fluctuation in the value of cryptocurrency can constitute a capital gain or capital loss. Thus, selling or trading NFTs or converting cryptocurrency into cash is taxable. An important factor that will affect your tax rate is the holding period. In other words, NFTs held for less than one year are taxed under short-term capital gains mean from 10% to 37% according to the brackets for 2023 tax year. NCTs held for more than one year will apply the long-term capital gains tax rate with a lower tax rate of 0%, 15%, or 20% (Roman, 2015: 453).

Conclusion

When tech moves forward, it's certain that the world around us will change fast. The metaverse will greatly affect both our lives day-to-day and our economies. So, it's important to take a smart approach that helps make it easy to get used to these shifts. The metaverse, with huge and new possibilities, will be brought up in deep talks. Because virtual spaces are linked to our real world, they have to follow set rules, taxes, and laws.

Governments should initiate dialogues based on principles and network with stakeholders to arrive at consensual tax principles and digital assets. The early movers will set the rules, and hence governments need to move fast to establish a governance framework together with the private sector. Authorities ought to facilitate taxpayers' compliance with the tax law requirements through block chain. To effectively harness digital transformation, such agencies must leverage the available tools, including AI. Thus, governments need to comprehend how the economy functions and conceive solutions for diverse situations.

The Metaverse and NFTs will dramatically alter existing concepts of taxation and functions of tax compliance. This poses a mammoth challenge to tax authorities; it, however, if embraced, could enable them to automate tax collection with real-time measures of compliance, reduce the need for audits, and minimize tax fraud. Otherwise, if governments do not take a proper insight into the taxation matters of the Metaverse and generate global rules to jointly govern and tax this environment, there is a risk that courts will feel obligated to decide on it, making it all confusing and litigious. Without regulating taxes on the digital universe, companies have been given a free lunch to take advantage of all the benefits of an unregulated economy. Hence, this may soon make the Metaverse the next offshore tax haven.

Therefore, tax authorities and policy makers should urgently come up with solutions that can tackle the problems arising from the taxability of transactions within the Meta database. Either a thorough review of the existing provisions is required or the publication of an entirely new framework addressing all aspects from a taxation point of view should be considered.

The research evidence proves NFT technology has brought significant changes to digital art practices. Block chain technology enables artists to create verifiable and tradable digital art assets which open new possibilities for artistic distribution and audience reach.

NFT technology has proven its ability to eliminate intermediaries in the art market which created an efficient and transparent process for buying and selling art. The intellectual property protection features of NFTs enable artists to receive compensation for their creations while preserving their rights.

NFT technology benefits creators by making communication with their fans and art connoisseurs easier. This breakthrough enables artists to establish networks and communicate with fans and consumers in ways that were not before.

The preservation of digital art has been significantly supported by NFT technology. Although the details pertaining to the artwork are recorded on the block chain, various methods ensure that the artwork is safeguarded across multiple platforms. Consequently, this scenario has prompted some artists to express concerns about the necessity for more robust techniques to protect the artwork itself.

The legal framework for NFT transactions includes complex reporting requirements and strict know-your-customer processes and evolving legal frameworks for taxation and anti-money laundering compliance and intellectual property protection. The regulatory requirements create substantial administrative challenges and financial expenses for independent artists who lack the established legal and financial systems of traditional art institutions. The inconsistent regulatory approaches between jurisdictions create additional confusion and compliance risks for artists who want to use NFTs to reach global audiences. The practical challenges stemming from these regulations threaten to undermine the independent market access that NFTs offer especially for artists who face unstable financial situations and limited professional networks. A refined regulatory system must establish a balance between compliance requirements and the distinctive needs of independent creators.

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